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JULY 2025

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MONTHLY NEWS ANALYSIS

Monthly ***Current Affairs*** *Magazine*
For All ***Civil Services Examinations***

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- Two new Ramsar sites in Rajasthan
- 113th International Labour Conference (ILC) held in Geneva
- India's first e-waste recycling park
- India's growth paradox
- BharatGen Programme
- India's 2027 Caste Census

Preface

In India, civil service examinations are not just a pathway to prestigious careers but also a means to contribute meaningfully to society and nation-building. Exams like UPSC and State PSCs, including WBPSC (West Bengal Public Service Commission), demand a deep understanding of subjects, analytical thinking, and a commitment to excellence.

RICE IAS, a name synonymous with quality education for over 40 years in West Bengal, is now broadening its horizons to support aspirants across the country. This magazine is designed to serve as a reliable resource for those preparing for UPSC and State PSC exams, including WBPSC.

Through this magazine, we aim to provide insightful content, detailed analysis of critical topics, and expert perspectives to help aspirants build a strong foundation. Key areas such as the Indian Constitution, economic developments, environmental challenges, and social issues are covered comprehensively, catering to the dynamic demands of both national and state-level examinations.

Our vision extends beyond merely sharing knowledge—we aim to inspire, motivate, and guide you in your preparation journey. From West Bengal to every corner of India, we are dedicated to helping aspirants achieve their dreams.

Wishing you great success,
Team RICE IAS

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POLITY & GOVERNANCE

1.1. WOMEN GRADUATES FROM THE NATIONAL DEFENCE ACADEMY (NDA)

Why in the News?

Recently, the National Defence Academy (NDA) in Pune saw its first batch of 17 female cadets graduate alongside more than 300 male cadets. This milestone follows the Supreme Court's 2021 directive allowing women to join the NDA, starting with the 148th course in 2022.

Significance: His development underscores India's commitment to gender inclusivity in the armed forces, opening doors for more women to pursue military careers. The female cadets earned degrees from Jawaharlal Nehru University, specializing in fields such as Science, Computer Science, Arts, and Technology.

Women in the Indian Armed Forces

Early Roles: During World War I and II, women primarily served as nurses and in administrative roles, with notable contributions from the Rani of Jhansi Regiment in Subhash Chandra Bose's Azad Hind Fauj.

- **Post-Independence Progress:** Initially confined to medical roles, women gradually expanded into logistics, engineering, and legal services. The 1990s marked their entry as pilots in the Indian Air Force.
- **Landmark Ruling:** The 2021 Supreme Court ruling granted women permanent commissions in the NDA, enabling them to train alongside men and serve in combat roles.

Recent Contributions and Achievements

Women officers have demonstrated leadership in operations like Operation Sindoor, led by figures such as Colonel Sofiya Qureshi and Wing Commander Vyomika Singh. Naval officers Lieutenant Commanders Dilna K and Roopa A showcased endurance and skill through the Navika Sagar Parikrama II expedition.

Arguments For Women in Defense	Challenges and Concerns
• Promotes gender equality and inclusivity. • Expands the talent pool with diverse skills. • Aligns with global practices in countries like the US, UK, and Israel. • Challenges traditional gender norms and inspires future generations.	• Physiological differences may necessitate modified training. • Infrastructure and logistical adjustments are required. • Concerns about combat readiness and integration. • Cultural and social resistance within military ranks.

Key Policy Steps

- **Agnipath Scheme (2022):** Includes women in short-term military recruitment, modernizing the forces.
- **Supreme Court Ruling (2020):** Granted permanent commissions to women, emphasizing equality.
- **Kargil Review Committee (1999):** Recommended expanding women's roles in non-combat areas.
- **Parliamentary Standing Committee:** Advocated for equal opportunities and better infrastructure for women officers.

The Road Ahead

While Indian women have made significant strides in defense, challenges like gender bias, infrastructure gaps, and societal attitudes remain. Continued policy support and cultural change will be crucial in empowering women to redefine India's defense landscape.

Q. Examine the progress and challenges of women's integration into the Indian Armed Forces. How effective are recent policy measures in promoting gender inclusivity?

[UPSC MAINS Practice Question]

1.2. NITI AAYOG AND A DEEPENING FEDERALISM IN INDIA

Why in the News?

India's federal structure faces renewed scrutiny amid debates over fiscal allocations, the end of GST compensation, and Centre–state tensions. Institutions like NITI Aayog and the GST Council reflect shifting dynamics, prompting a fresh look at cooperative and fiscal federalism.

India's Federal Evolution Over the Past Decade

Reinterpreting Federalism

Though the Constitution doesn't explicitly mention "federalism," Dr. B.R. Ambedkar envisioned a system that could be both unitary and federal, as circumstances demand. Traditionally Centre-heavy, India has seen a notable shift over the past decade towards empowering states and fostering collaborative governance.

Cooperative Federalism: Centre–State Partnership	**Competitive Federalism: States Driving Innovation**
Cooperative federalism emphasizes joint decision-making between the Centre and states. Platforms like the **NITI Aayog Governing Council**, where the PM and Chief Ministers meet as equals, reflect this shift. The principle of *"Sabka Saath, Sabka Vikas"* captures this spirit of inclusive governance. **Example:** *NITI Aayog*, replacing the Planning Commission, now acts as a policy think tank, not a funding body. Its **Aspirational Districts Programme** promotes shared development goals, improving key indicators in lagging regions.	India has also embraced competition among states to boost governance and attract investment. **NITI Aayog's indices**—including the **Health Index**, **SDG Index**, and **Innovation Index**—spur states to enhance outcomes in education, healthcare, and infrastructure.

Fiscal Federalism: Financial Devolution in Practice

A stronger federal setup requires fair resource distribution. Key developments include:

- **GST Council**: A joint forum for tax decisions, ensuring consensus-based fiscal policy.
- **Tax Devolution**: The 15th Finance Commission raised states' share of central taxes from 32% to 41%.
- **GST Compensation**: ₹6.52 lakh crore was transferred to states between FY18–25 to offset revenue loss.
- **CSS Funding**: A 197% rise in allocations (2015–2024) empowered states to boost socio-economic development.

Key Challenges

Despite progress, several issues hinder deeper federalism:

- **Fiscal Dependence**: Over 40% of state revenue comes from central transfers; post-GST compensation, many face strain.
- **Power Imbalance**: Smaller or opposition-ruled states often struggle to negotiate equitable terms.
- **Rigid CSS Design**: Uniform schemes don't reflect local realities; states often bear costs without decision-making power.

- **Weak Institutional Forums**: Bodies like the Inter-State Council are underutilized.
- **Centre Overreach**: Intervention in state subjects (e.g., agriculture laws) raises concerns over constitutional boundaries.

Federalism: The Way Forward

India's federal journey, though evolving, reflects a growing commitment to collaborative governance. The past decade has highlighted the potential of cooperative and competitive federalism, with institutions like NITI Aayog and the GST Council leading the way. Yet, challenges like political friction and structural limitations persist.

To strengthen the federal framework, key reforms are essential:

- **Grant statutory status to NITI Aayog** for greater authority and accountability.
- **Revamp Centrally Sponsored Schemes (CSS)** to allow more flexibility and state-specific design.
- **Revitalize inter-state platforms** like the Inter-State Council for meaningful dialogue and dispute resolution.

As envisioned by Dr. Ambedkar, India's system must remain adaptable—federal in spirit, unitary when needed. With the right reforms, federalism can evolve from a guiding principle to the cornerstone of Indian democracy.

Q. Which of the following statements regarding India's federal structure and the role of NITI Aayog is/are correct?

1. NITI Aayog has replaced the Planning Commission and functions as a funding body for states.
2. The Aspirational Districts Programme is an initiative under NITI Aayog aimed at improving governance in lagging regions.
3. The GST Council operates on a principle of majority voting by the Union government.
4. The Inter-State Council is actively used as a primary forum for Centre–State dialogue.

Select the correct answer using the code below: ***[UPSC Pre. Practice Question]***

(a) 1 and 3 only (b) 2 only

(c) 2 and 4 only (d) 1, 3 and 4 only

Ans. (b) 2 only

1.3. URBANISATION AND THE CHALLENGE OF IDEAL TRANSIT SOLUTIONS

Why in the News?

As India rapidly expands its metro and tier-1 cities, the need for **efficient, accessible, and sustainable urban transit** has become a pressing challenge. With urbanization accelerating, mobility infrastructure is struggling to keep pace—prompting renewed focus on public transport, smart mobility, and green alternatives.

Urbanization Trends: The Mobility Challenge

- **Global Context**: Over **4 billion people** live in urban areas today; by **2050**, that figure is expected to reach **68%** globally.
- **India's Urban Shift**: India's urban population is projected to exceed **600 million by 2030**, reaching over **60% of the total population by the 2060s**.
- **Megacity Boom**: Cities with populations over 10 million are set to rise sharply by **2035**, increasing transit pressures.

Key Challenges in Urban Mobility

- **Limited Public Transport Access**: Only **37%** of India's urban population has reliable access to public transport—well below Brazil and China.
- **Severe Bus Shortage**: Against a need for **2 lakh urban buses**, only **35,000**, including e-buses, are in service.
- **Environmental Impact**:
  - The transport sector contributes around **15% of global CO_2 emissions**.
  - Indian cities face rising air pollution due to fossil-fuel vehicles.
- **Metro Project Constraints**: High infrastructure costs, low ridership, and poor cost recovery hinder long-term sustainability.

India's Recent Transit Initiatives

- **PM e-Bus Sewa & e-Drive**: Targets induction of **14,000 e-buses** and over **1 lakh electric vehicles** (e-rickshaws, trucks, ambulances).
- **Metro Network Expansion**: Increased investment in metro systems to enhance urban connectivity.
- **Focus on Sustainable Infrastructure**: Government aims to build future-ready, climate-conscious transit systems.

Global Best Practices

- **Hong Kong (MTR)**: Combines mass transit with real estate development to generate revenue and build walkable neighborhoods.
- **Curitiba (Brazil)**: Pioneered **Bus Rapid Transit (BRT)** with low-cost, high-capacity service.
- **Tokyo (Shibuya Station)**: Integrates multi-modal transport with commercial and cultural hubs.

Pathways to Sustainable Urban Transit in India

1. **Expand Mass Rapid Transit**: Metro rail and BRT corridors for faster, high-volume movement.
2. **Encourage Non-Motorized Mobility**: Develop cycling lanes and pedestrian-friendly zones.
3. **Adopt Smart Mobility Solutions**: Use AI for traffic control, integrate ride-sharing, and explore autonomous vehicles.
4. **Promote Transit-Oriented Development**: Align housing, offices, and transport hubs for better accessibility.
5. **Diversify Transport Tech**: Invest in hydrogen, biofuels, and CNG to support cleaner road-based alternatives.
6. **Strengthen Last-Mile Connectivity**: Prioritize smaller, flexible transit options to bridge gaps between metro and final destinations.

India's urban future hinges on **integrated, sustainable, and inclusive transit systems**. While current efforts mark progress, scaling up public transport, leveraging technology, and adopting global best practices are essential to meet the mobility demands of a growing urban population.

Q. *"India's urban mobility crisis reflects the wider tension between rapid urbanization and inadequate infrastructure planning."* Discuss the major challenges in ensuring sustainable urban transit in India. Highlight innovative domestic initiatives and global best practices that India can adopt to address the issue effectively. ***[UPSC MAINS Practice Question]***

1.4. NEWS IN SHORTS

1.4.1. JUSTICE SURYA KANT CAUTIONS AGAINST JUDICIAL OVERREACH

Why in the News?

Supreme Court Judge Justice Surya Kant, in a recent address in San Francisco, cautioned against judicial overreach and emphasized the need for restraint, judicial literacy, and transparency—particularly in today's digital era where court decisions are often misinterpreted.

Judicial Overreach and Constitutional Balance

Justice Kant warned that even well-meaning judicial activism can upset the balance of power, undermining the legislature and democratic will. Courts, he said, must act within constitutional limits—facilitating dialogue, protecting the vulnerable, and reinforcing the rule of law.

Transparency in the Digital Age

While digital platforms enhance access to court decisions, they also risk reducing complex rulings to misleading headlines. Justice Kant stressed that courts must communicate clearly to prevent misinterpretation and preserve judicial credibility.

Judicial Literacy: A Public Imperative

Transparency without understanding can be harmful. Justice Kant advocated for greater legal education through public outreach, simplified verdict summaries, and school partnerships to foster informed civic engagement.

Guarding Against Media Trials and Misinformation

He cautioned against the rise of media trials, where verdicts are judged in the public eye before court rulings. Such distortions erode trust and mislead citizens about legal processes.

Justice Surya Kant's address reinforces the need for judicial restraint, clarity in communication, and legal literacy to uphold the judiciary's legitimacy and role in a robust democracy shaped by fast-moving digital narratives.

Q. "Judicial overreach, even when well-intentioned, can undermine democratic processes." Critically examine this statement in the context of Justice Surya Kant's views on judicial restraint, transparency, and judicial literacy in the digital age. How can these principles strengthen the judiciary's role in India's democracy? ***[UPSC MAINS Practice Question]***

1.4.2. JUSTICE HEMA COMMITTEE REPORT

Why in the News?

The Justice Hema Committee report was made public by Kerala Government, revealed discrimination and exploitation faced by women in the Malayalam film industry.

About the Commitee

- The Kerala government formed the Justice Hema Committee to investigate sexual harassment and gender inequality in the industry.
- This was the first such committee formed by any state in the country.
- The Kerala police on Tuesday dropped 35 sexual assault cases which were booked after the Justice Hema Committee report. It cited **non-cooperation** of survivors (fearing retribution) and **insufficient proof** due to time delays, as grounds for dropping the cases.

Key Findings of the Report

- Widespread **casting couch practices** and vulgar remarks were normalized.
- Women often faced **sexual advances from drunk co-actors**, with little to no workplace safeguards.
- **Fear of professional retaliation** stopped many from filing complaints.
- The industry lacked any functional **internal complaints committees** under the Sexual Harassment of Women at Workplace Act, 2013.

The report is a crucial reckoning for the film industry, revealing deep-rooted misogyny and silence. While the legal route has faltered, the real solution lies in institutional reform, survivor-centric justice, and cultural change.

Q. Consider the following statements about the Justice Hema Committee:

1. It was formed to investigate caste discrimination in the Malayalam film industry.
2. It was the first committee by a state government in India to address gender inequality in cinema.
3. The Committee highlighted the lack of internal complaints committees under the Sexual Harassment Act.

Which of the above statements is/are correct? ***[UPSC Pre. Practice Question]***

(a) 1 and 2 only (b) 2 and 3 only

(c) 1 and 3 only (d) 1, 2 and 3

Ans. (b) 2 and 3 only

1.4.3. NAKSHA PROGRAMME

Why in the News?

NAKSHA (National geospatial Knowledge-based land Survey of urban HAbitations) is a pioneering one-year pilot programme launched by the Department of Land Resources (DoLR) under the Digital India Land Records Modernization Programme (DILRMP).

About NAKSHA

- **Objective**: To revolutionize urban land record management through modern geospatial technology and digital mapping.
- **Coverage**:
  - Implemented across **157 Urban Local Bodies (ULBs)**
  - Spans **27 States and 3 Union Territories**
  - Covers an area of **over 4484 sq. km**
  - Aims to benefit **1.5 crore+ urban citizens**
- **Technology Used**:
  - **Aerial surveys** using drones and advanced sensors
  - **Field verification** for accuracy and validation
  - Creation of a **GIS-integrated database** of land parcels
- **Implementation Support**:
  - **Survey of India** – Technical leadership
  - **NICSI (National Informatics Centre Services Inc.)** – Digital infrastructure
  - **MPSeDC (Madhya Pradesh State Electronics Development Corporation)** – Field execution

- **Five National Centres of Excellence** – Training, technical advisory, and innovation
- **Goal**: To create **transparent, accurate, and accessible urban land records**, supporting better planning, dispute resolution, revenue generation, and infrastructure development.

Benefits of NAKSHA

- **Legal clarity** in urban land titles
- Promotes **ease of doing business** in urban real estate
- Enables **property tax optimization**
- Aids in **slum mapping**, urban poor welfare, and **infrastructure planning**
- Provides crucial data for **urban disaster resilience** planning (e.g., floods, earthquakes)

Digital India Land Records Modernization Programme (DILRMP)

Launched: 2008 (originally as National Land Records Modernization Programme)

Renamed: 2016 under the **Digital India** initiative

Objectives:

- **Computerize land records** for transparency and easy access.
- **Digitally link land records with maps, registration, and mutation**.
- **Survey and resurvey** using modern technology (like GIS, drones).
- Create a **real-time, unified land information system (LIS)**.
- Minimize land disputes and litigation.

Key Components:

- **Computerization of land records (RoR)**
- **Digitization of cadastral maps**
- **Integration with registration offices**
- **Survey/re-survey using modern techniques**
- **Setting up modern record rooms**
- **Training and capacity building of staff**

Recent Initiatives under DILRMP:

- **SVAMITVA Scheme** (for rural areas)
- **NAKSHA Programme** (for urban land records)
- Integration with **DigiLocker**, **Bhoomi Portals**, and **PM GatiShakti**

NAKSHA vs. SVAMITVA Scheme

Feature	NAKSHA (Urban)	SVAMITVA (Rural)
Full Form	NAtional geospatial Knowledge-based land Survey of urban HAbitations	Survey of Villages and Mapping with Improvised Technology in Village Areas
Area Covered	Urban local bodies (157 ULBs in pilot)	Rural villages across India
Launched by	DoLR under DILRMP	DoLR, Ministry of Panchayati Raj
Focus	Urban land parcels and municipal land records	Rural household ownership and village mapping

Technology Used	Aerial survey, GIS, drones, field verification	Drone mapping, GIS-based village mapping
Objective	Urban land modernization, ownership clarity, planning	Legal ownership of rural properties, rural planning
Key Partners	Survey of India, NICSI, MPSeDC, CoEs	Survey of India, State Revenue and Panchayati Raj Depts.
Legal Documentation	Urban land ownership records	Property cards / "Svamitva Patras"
Impact Focus	Urban planning, municipal tax, disaster mgmt	Empowerment of rural households, access to credit

NAKSHA is a crucial step toward bridging the urban land information gap, supporting goals like Smart Cities, AMRUT, and Affordable Housing. Alongside SVAMITVA for rural areas, it marks a transformative shift in India's land governance, promoting transparency, planning efficiency, and inclusive development across both urban and rural landscapes.

Q. Evaluate the role of the NAKSHA programme in modernizing urban land governance in India. Compare its objectives and implementation with the SVAMITVA scheme.

[UPSC MAINS Practice Question]

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INTERNATIONAL RELATIONS

2.1. 4TH MEETING OF THE INDIA – CENTRAL ASIA DIALOGUE

Why in the News?

External Affairs Minister Dr. S. Jaishankar recently hosted the 4th edition of the *India-Central Asia Dialogue*, aiming to explore economic growth avenues and enhance strategic cooperation between India and the Central Asian Republics (CARS).

Key Highlights of the Dialogue

1. **Strengthening Financial Cooperation**
   - Central Asian banks opened *special rupee vostro accounts* in Indian financial institutions to ease cross-border trade.
   - Discussions included the potential adoption of *India's UPI* system for seamless international digital payments.
2. **Boosting Trade & Connectivity**
   - Emphasis on diversifying trade baskets to make bilateral trade more resilient and predictable.
   - India advocated expanding *air services* and simplifying *transit protocols* to facilitate smoother logistics.
3. **Commitments from Central Asia**
   - **Kazakhstan** praised India's innovation ecosystem and expressed intent to boost economic ties.
   - **Kyrgyzstan** reaffirmed the strategic nature of its partnership with India.
   - **Turkmenistan** recognized India as a key economic partner in Asia's evolving geo-economic landscape.

Overview: India-Central Asia Relations

Historical Ties:

- Relations trace back to the *Silk Road era* (3rd century BC–15th century AD) with exchanges of goods, ideas, and religion, particularly Buddhism.
- Empires such as the Kushans, Mughals, and Sufism further strengthened historic bonds.

Modern Engagement:

- **Strategic Focus:** Trade, energy, connectivity, defense, and cultural ties.
- **Chabahar Port** and **INSTC** are central to connectivity goals.
- Shared concerns on *regional security* and *counter-terrorism*, especially in the context of Afghanistan.

Challenges in the Partnership

- **Trade Deficit:** India's annual trade with Central Asia remains under $2 billion, dwarfed by China's ~$50 billion.
- **Logistical Barriers:** Lack of direct land access, bureaucratic delays, and regional tensions hinder progress.
- **Security Concerns:** Instability in Afghanistan and China-Pakistan dynamics complicate strategic outreach.
- **Financial Integration Issues:** Banking and regulatory gaps limit seamless digital and monetary cooperation.

The Way Forward

1. **Infrastructure & Connectivity**
   - Fast-track *Chabahar Port Phase-2* and the *Chabahar-Zahedan rail link*.
   - Expand *INSTC* to streamline routes to Central Asia via Iran and the Caucasus.
2. **Institutional & Strategic Engagement**
   - Establish a *Central Asia Task Force* in the MEA.
   - Institutionalize the Dialogue through regular summits.
3. **Trade & Economic Cooperation**
   - Explore a *Central Asia-India Free Trade Agreement (FTA)*.
   - Partner in *renewable energy* (solar, hydrogen) and critical minerals; re-engage on the *TAPI pipeline*.
4. **Cultural & Soft Power Diplomacy**
   - Increase *ICCR scholarships*, cultural events, and promote yoga and Bollywood.
   - Set up India-supported *centres of excellence* in education and technology.
5. **Multilateral Collaboration**
   - Use forums like the *Shanghai Cooperation Organisation (SCO)* for initiatives on cybersecurity, health, and counterterrorism.

The 4th India-Central Asia Dialogue reflects India's deepening strategic intent to build a robust, multifaceted partnership with the Central Asian region. With historical goodwill, shared interests, and mutual potential, the path forward lies in expanding connectivity, boosting trade, and institutionalizing cooperation to counter regional challenges and unlock long-term economic synergy.

Q. "*India's strategic outreach to Central Asia reflects both historical continuity and contemporary geopolitical imperatives.*" Critically analyze the significance of the India–Central Asia Dialogue in enhancing regional cooperation. What challenges persist, and how can India overcome them to deepen engagement? ***[UPSC MAINS Practice Question]***

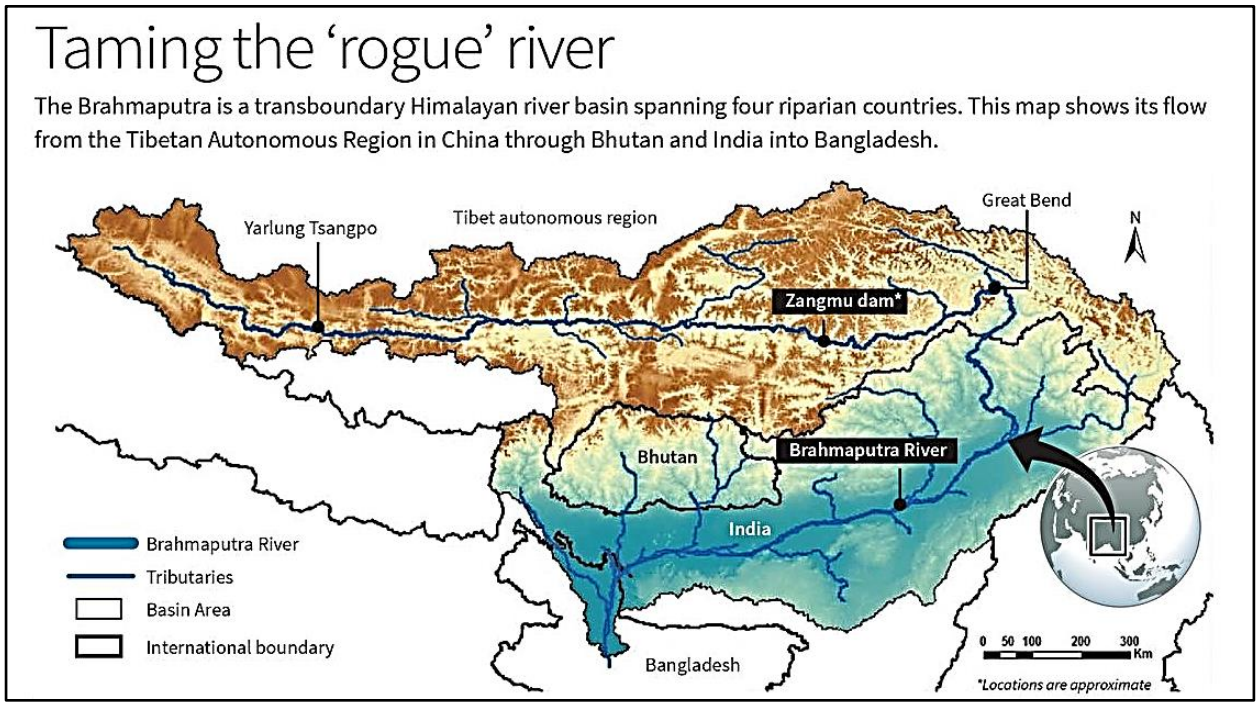
2.2. CHINA'S MEGA-DAM PROJECT ON BRAHMAPUTRA RIVER

Why in the news?

China has approved the construction of a massive 60 GW hydropower dam at the Great Bend of the Brahmaputra (Yarlung Zangbo) in Tibet, as part of its 14th Five-Year Plan. The project raises serious concerns for India, Bhutan, and Bangladesh due to its potential downstream and geopolitical impacts.

About the Project

- **Location**: Great Bend of the Brahmaputra (Yarlung Zangbo) in Medog, TAR, China.
- **Capacity**: A massive **60 GW**, larger than China's own Three Gorges Dam.
- **Purpose**: Hydropower generation; seen as a state-backed symbol of China's technological prowess and sovereign control over rivers.
- **Geopolitical Significance**: Part of a **larger dam-building race** in the Brahmaputra basin involving **India (Upper Siang project)** and **Bhutan (several medium-scale dams)**.



Implications of the Project

- **Hydrological Impact**
  - Alters the **perennial flow** of the Brahmaputra downstream in **India and Bangladesh**.
  - May disrupt **groundwater recharge**, **monsoon rainfall patterns**, and **agricultural irrigation**.
  - Heightens risks of **seasonal flow manipulation**, potentially turning water into a **geopolitical tool**.
- **Ecological Fragility**
  - The dam risks disrupting the **Himalayan cryosphere**, which supports **glaciers, wetlands, and permafrost systems**.
  - Alters the river's **natural lifecycle**, affecting **biodiversity**, **aquatic species**, and **wetland ecosystems**.
- **Community Vulnerability**
  - Marginalises traditional **agro-pastoralist communities** by making centuries-old river knowledge obsolete.
  - Magnifies disaster risks, as seen in the **Chungthang dam collapse (Sikkim, 2023)** and historical **Medog earthquake (1950)** which reshaped the river basin.
- **Strategic Tensions**
  - The Brahmaputra becomes a site of **strategic posturing** between China and India, driven by unresolved **border disputes** and the race to claim **riparian dominance**.
  - China's unilateral decision-making raises fears of a "**dam-for-dam**" policy spiral, further **securitizing** river governance.

Treaties and Governance Frameworks

- **Lack of Multilateral Treaty**
  - None of the Brahmaputra riparian states—**China, India, Bhutan, Bangladesh**—are signatories to the **UN Convention on the Non-navigational Uses of International Watercourses (1997)**.
  - There is **no enforceable mechanism** for shared, equitable, and sustainable use of transboundary rivers.

- **Bilateral Mechanisms**
  - **China–India Expert Level Mechanism (ELM)** (since 2006): Limited to **data sharing**, lacks legal enforceability or conflict resolution capacity.
  - No **binding river-sharing treaty** exists between China and its downstream neighbors.
- **Legal Ambiguity**
  - The **"first-user rights" principle** lacks international recognition in absence of treaty obligations.
  - Upstream nations like China continue to act **unilaterally**, asserting de facto control over river systems.

Way Forward

- **Promote regional cooperation** based on ecological sustainability rather than geopolitical competition.
- **Avoid retaliatory dam-building** and adopt a restrained, climate-resilient approach.
- **Strengthen bilateral mechanisms** like the ELM and push for a multilateral water-sharing framework.
- **Champion international water laws** by advocating for the UN Water Convention.
- **Involve local communities** and integrate traditional knowledge into river governance.

The Brahmaputra river basin is not just a site of strategic competition—it is a vital ecological and cultural lifeline for millions. **India must lead with restraint, responsibility, and regional vision**, ensuring that cooperation, not confrontation, defines the future of Himalayan water diplomacy.

Q. With reference to China's mega-dam project on the Brahmaputra River, consider the following statements:

1. The dam, located at the Great Bend of the Yarlung Zangbo in Tibet.
2. The Brahmaputra River basin is governed by a multilateral treaty under the UN Convention on the Non-navigational Uses of International Watercourses (1997).
3. The China-India Expert Level Mechanism (ELM) facilitates legally binding agreements on Brahmaputra water sharing.

Which of the statements given above is/are correct? ***[UPSC Pre. Practice Question]***

(a) 1 only (b) 1 and 2 only

(c) 2 and 3 only (d) 1, 2, and 3

Ans. (a) 1 only

2.3. INDIA - VIETNAM RELATIONS

Why in the News?

India and Vietnam have agreed to step up cooperation in the media and entertainment sector during a meeting held in New Delhi between **Dr. L. Murugan,** Minister of State for Information and Broadcasting, and a Vietnamese delegation of high-ranking officials.

Background of the News

- The bilateral meeting explored cooperation in film production, content sharing, capacity building, and cultural exchange.

Historical Context

- Civilizational linkages include shared **Buddhist heritage**, maritime exchanges, and mutual respect for ancient philosophies and traditions.

India–Vietnam Relations: Key Highlights

- **Comprehensive Strategic Partnership**
  - **2016:** Relationship elevated from *Strategic Partnership* to *Comprehensive Strategic Partnership* during PM Narendra Modi's visit to Vietnam.
  - **2020:** Adoption of the "Joint Vision for Peace, Prosperity and People", enhancing cooperation across political, defence, and economic domains.
  - **2022:** Celebration of the 50th anniversary of diplomatic ties, marking half a century of enduring friendship.
    - **Joint stamp issued (2022)** featuring *Kalaripayattu* and *Vovinam.*
  - **2024:** Bilateral momentum reinforced through multiple high-level political and ministerial exchanges, including sectoral cooperation in media, energy, and digital technologies.
- **Trade & Economic Relations**
  - **Bilateral Trade (April 2024 – March 2025):** Total Trade: USD 15.76 billion.
  - **Key Export Sectors:** Pharmaceuticals, auto parts, iron and steel, machinery, cotton yarn.
  - **Key Import Sectors:** Electronics, electrical machinery, chemicals, rubber, and textiles.
  - **Investment:** Indian companies have invested over USD 1.9 billion in Vietnam, mainly in agriculture, manufacturing, and renewable energy.
- **India–Vietnam Defence Cooperation Frameworks**
  - **2009:** MoU on Defence Cooperation signed, formalizing defence ties.
  - **2015:** Joint Vision Statement laid the foundation for strategic military cooperation.
  - **2022:** Joint Vision Statement on India–Vietnam Defence Partnership toward 2030 signed, committing to deeper cooperation in defence manufacturing, training, and maritime security**.**
- **Defence Training and Supplies**
  - India regularly provides military training and capacity building support to Vietnamese defence personnel under ITEC.
  - India has supplied patrol boats and other defence equipment under the $500 million Defence LoC.
- **Naval Cooperation**
  - Bilateral Naval Cooperation: **Frequent port calls and PASSEX exercises in the South China Sea and the Indian Ocean.**
  - Joint Military Exercise: **VINBAX held regularly, reflecting enhanced land-based military cooperation.**
  - Maritime Domain Awareness: Ongoing collaboration in hydrography, ship building, and information sharing.
- **Regional and Global Cooperation**
  - **Indo-Pacific Vision:** Both countries promote a free, open, inclusive, and rules-based Indo-Pacific.
  - **Multilateral Coordination**:
    - Strong alignment in ASEAN-led frameworks, including EAS, ADMM+, and Mekong-Ganga Cooperation.
    - Vietnam supports India's candidature for permanent membership of the UN Security Council.
    - India supports Vietnam's centrality in ASEAN and strategic role in Southeast Asia.

Recent Developments and Cooperation

- **WAVES 2025 Summit, India**: **Vietnam's participation in WAVES 2025** strengthened media and cultural engagement.
- **Plan of Action (2024–2028)** signed to advance the strategic partnership.
- **Vietnam joined CDRI**, boosting climate and infrastructure collaboration.

Q. Examine how India and Vietnam are leveraging multilateral platforms to promote shared interests in global governance and regional order**.** ***[UPSC MAINS Practice Question]***

2.4. PM MODI IN CYPRUS AFTER 23 YEARS

Why in the News?

Prime Minister Narendra Modi visited Cyprus on June 15–16, 2025 — the first visit by an Indian PM in over two decades. A **Joint Declaration on Comprehensive Partnership** was signed with Cypriot President Nikos Christodoulides, charting a strategic roadmap for bilateral cooperation across key, maritime and people-to-people ties.

About Cyprus

- Cyprus is an **island nation** in the **eastern Mediterranean Sea**, located close to Turkey and Syria.
- Despite being geographically in Asia, Cyprus is a member of the **European Union (EU)**.

Key Highlights of Joint Declaration

- **PM Modi Conferred Cyprus's Highest Civilian Honour**
  - President Nikos Christodoulides awarded PM Modi the **"Grand Cross of the Order of Makarios III"**, Cyprus's highest civilian honour, recognizing his contribution to advancing bilateral ties and global diplomacy.
- **Strengthening Ocean Governance and Climate Action**
  - Both sides committed to implementing the **2024 Apia Commonwealth Ocean Declaration**
  - **Focus**: Sustainable ocean governance, climate resilience, marine biodiversity.
  - **Blue Charter Centre of Excellence** launched in Cyprus to build capacity across Commonwealth nations.
- **Enhancing Political and Institutional Engagement**
  - Regular **high-level dialogue** agreed between both Foreign Ministries.
  - Upcoming **2025–2029 Action Plan** to be jointly monitored and implemented.
- **Firm Support for Cyprus Sovereignty and Peace Process**
  - India reiterated support for **Cyprus's sovereignty, unity, and territorial integrity**.
  - Supported **UN-led settlement** based on **bizonal, bicommunal federation**.
  - Opposed any **unilateral actions** undermining negotiations.
- **Expanding Defence and Security Cooperation**
  - Strong condemnation of terrorism, including **recent Pahalgam attack (J&K)**.
  - Pledged joint efforts in:
    - **Counter-terrorism**, dismantling terror infrastructure & financing networks.

    - **Cybersecurity, defence collaboration, crisis coordination**.
    - **Maritime security** via port calls, naval training & exercises.
    - Supported early adoption of **UN Comprehensive Convention on International Terrorism**.
- **Connectivity & Regional Integration**
    - Supported **India–Middle East–Europe Economic Corridor (IMEC)** as a game-changer.
    - Cyprus to serve as **logistics hub** and gateway for Indian trade to Europe.
    - Encouraged **joint ventures** between Cyprus and Indian maritime/shipping sectors
- **EU–India Strategic Engagement**
    - Cyprus pledged to boost **India–EU ties** during its **EU Council Presidency (2026)**.
    - Committed to finalizing the **India–EU Free Trade Agreement** by end of 2025.
    - Supported the **EU–India Trade and Technology Council** and extension of **2025 Strategic Roadmap**.
- **Trade, Innovation & Economic Partnership**
    - Agreed to organize a **Cyprus–India Business Forum**.
    - Explore MoU on cooperation in **AI, digital infrastructure, research & innovation**.
    - Encouraged stronger links between **startups, academia, and industry**.
- **Mobility, Tourism & Cultural Ties**
    - **Mobility Pilot Program** to be finalized by **end-2025**.
    - Emphasis on enhancing **tourism, cultural exchanges**, and exploring **direct air connectivity**.
- **Action Plan 2025–2029**
    - A detailed **5-year Action Plan** will steer bilateral cooperation.
    - To be jointly monitored by the **Foreign Ministries** of both nations.

India's Cyprus Stand: A Diplomatic Signal to Turkey

- During PM Modi's **June 2025 visit to Cyprus**, India reaffirmed its strong support for the **sovereignty, unity, and territorial integrity** of the Republic of Cyprus.
- The move comes amid **strained ties with Turkey**, which has criticized India over **Jammu & Kashmir** and backed **Pakistan** following the **Pahalgam terror attack** and **Operation Sindoor**.
- PM Modi's visit to the **Historic Centre of Nicosia**, near **Turkish-occupied Northern Cyprus**, served as a **clear symbolic gesture** of India's solidarity with Cyprus.

Turkey-Cyprus Conflict: Origins and Ongoing Tensions

- **Post-Independence Strains (1960):** Cyprus gained independence from Britain in 1960, but ethnic tensions quickly rose between Greek and Turkish Cypriots.
- **1974 Division:** A Greek-backed coup led to Turkey's invasion, resulting in the creation of the **Turkish Republic of Northern Cyprus (TRNC)**—recognized only by Turkey.
- **Persistent Division:** The island remains split, with a UN buffer zone separating the Greek Cypriot south and Turkish-occupied north.
- **Failed Peace Efforts:** UN-led talks have repeatedly stalled over core issues like territorial return, power-sharing, and security guarantees.

- **Energy Disputes:** Tensions have intensified due to competing claims over natural gas reserves in the Eastern Mediterranean, involving Cyprus, Turkey, and regional players.

Q. Analyze the significance of the India–Cyprus Joint Declaration of 2025 in strengthening bilateral and regional cooperation. ***[UPSC MAINS Practice Question]***

2.5. 51ST G7 LEADERS SUMMIT

Why in the News?

The **2025 G7 Leaders' Summit**, marking its **51st edition**, was held in **Kananaskis, Alberta, Canada**, under Canada's rotating G7 Presidency. **India, the fifth-largest economy in the world,** participated as an **Outreach Country**. Next G7 leaders' summit will take place at **Evian in French Alps**.

Key Highlights of G7 Leaders' Summit

- **Theme**: The 2025 G7 Outreach Summit, hosted by Canadian Prime Minister Mark Carney, was centered around **three key themes**: protecting global communities, building energy security while accelerating the digital transition, and securing partnerships for the future.
- **Global Guests at G7 Summit:** Leaders from guest countries including India, South Africa, Brazil, Mexico, South Korea, and Australia, along with the UN Secretary General and the President of the World Bank participated in the Outreach Session.
- **Six Joint Statements**: The conference produced **six joint statements** focused on cooperation in the following areas:
  - Artificial Intelligence (AI)
  - Quantum Technology
  - Critical Mineral Supply Chains
  - Multilateral efforts to combat and recover from wildfires
  - Tackling foreign interference, with emphasis on transnational repression
  - Countering migrant smuggling by dismantling transnational organised crime networks

India and the G7 Summit

- **PM Narendra Modi** addressed a session on **'Energy Security: Diversification, Technology, and Infrastructure to Ensure Access and Affordability in a Changing World'** at the 2025 G7 Summit.
- Highlighted the **impact of global conflicts on the Global South** and India's role in voicing their concerns.
- Emphasized **zero tolerance for terrorism** and rejection of double standards.
- Called terrorism a **grave threat to humanity**.
- Apart from the summit, **PM Modi also held a series of bilateral meetings** with the leaders of **Germany, Canada, Ukraine, and Italy**.

About G7

- **Members**: The G7 is an annual **intergovernmental forum** comprising the leaders of France, the United States, the United Kingdom, Germany, Japan, Italy, and Canada, following a rotating presidency, along with the European Union.
  - The European Union participates as an **observer** and does not hold the rotating presidency.
- **Origin**: Formed in the 1970s during the energy crisis to coordinate policies on **macroeconomics, currency, trade, and energy**.

Q. With reference to the 2025 G7 Leaders' Summit, consider the following statements:

1. The summit focused on energy security, digital transition, and forging global partnerships.
2. India participated as a full member of the G7.
3. The summit resulted in joint statements on combating wildfires and foreign interference.
4. The next G7 summit will be hosted by France in the French Alps.

Which of the statements given above is/are correct? ***[UPSC Pre. Practice Question]***

(a) 1 and 3 only (b) 1, 3 and 4 only

(c) 2 and 4 only (d) 1, 2, 3 and 4

Ans. (b) 1, 3 and 4 only

2.6. INDIA - CANADA RELATION

Why in the News

At the G7 Outreach Summit in Kananaskis, PM Narendra Modi and Canadian PM Mark Carney agreed to **restore High Commissioners in Delhi and Ottawa** after two years diplomatic freeze, and discussed reviving trade talks, visa services, and bilateral dialogues, marking a reset in India–Canada ties.

Key Highlights of the Meeting

- **Reviving Trade Engagements:** Both the leaders agreed to restart the stalled negotiations on the Early Progress Trade Agreement (EPTA), viewing it as a critical step towards a Comprehensive Economic Partnership Agreement (CEPA).
- **Sectoral Collaborations:** The two leaders also discussed enhancing **bilateral cooperation** across multiple strategic sectors including clean energy, digital transformation, artificial intelligence (AI), liquefied natural gas (LNG), food security, critical minerals, higher education, mobility, and supply chain resilience.

Background: Factors Behind the Diplomatic Fallout

- **Khalistani Extremism Issue:** Canada's alleged inaction against extremist elements threatening India's sovereignty (e.g., 2023 unofficial Sikh referendum).
- **Diplomatic Strain**: Relations deteriorated following allegations by Canada linking Indian diplomats to the killing of a Sikh separatist leader. This led to a tit-for-tat expulsion of diplomats from both nations in October 2024.
- **Lack of Security Cooperation**: India has raised concerns over Canada's inaction on multiple extradition requests related to individuals accused of terrorism residing in Canada.

India–Canada Relations: Key Dimensions

Domain	Details
Foundational Values	Bilateral ties are rooted in shared principles of democracy, cultural pluralism, growing economic cooperation, and deep people-to-people connections.
Economic Engagement	In 2024, India exported goods worth **USD 4.07 billion** to Canada, while imports from Canada stood at **CAD 5.3 billion**.
Consular Cooperation	A **Mutual Legal Assistance Treaty** was signed in **1994**, and an **Extradition Treaty** was signed in **1987**, fostering legal collaboration.
Science & Technology	Joint work includes collaboration in **Polar and Arctic research**, and development of **sustainable fuel technologies**.

Space Cooperation	In **2018**, ISRO launched Canada's **first Low Earth Orbit (LEO) satellite** during the PSLV's 100th mission.
Civil Nuclear Ties	A **Nuclear Cooperation Agreement (NCA)** was signed in **2010** and entered into force in **2013**, enabling peaceful nuclear collaboration.

Q. Critically analyze the causes of the India–Canada diplomatic fallout and examine the significance of the recent efforts to reset bilateral ties. ***[UPSC MAINS Practice Question]***

2.7. 113TH INTERNATIONAL LABOUR CONFERENCE (ILC) HELD IN GENEVA

Why in the News

The 113th International Labour Conference (ILC), held from June 2 to 13, 2025, at the Palais des Nations and ILO headquarters in Geneva, Switzerland, marked a landmark development with the adoption of the first-ever international labour standards.

Background of the News

- The 113th International Labour Conference (ILC), convened by the International Labour Organization (ILO), brought together more than 5,400 delegates from 187 Member States, including representatives of governments, employers, and workers.
- The conference addressed **key global labour challenges and led to landmark outcomes**, such as the adoption of the 2025 Biological Hazards in the Working Environment Convention (Convention No. 192), amendments to the 2006 Maritime Labour Convention (MLC), and notable progress in the formal recognition of care and platform economy workers.

Major Outcomes of the 113th International Labour Conference (ILC), 2025

- **Adoption of Biological Hazards in the Working Environment Convention, 2025 (Convention No. 192):**
  - The ILC approved the world's first dedicated international convention aimed at addressing **biological hazards in workplaces**.
  - The convention urges ILO Member States to develop national occupational safety and health (OSH) policies that specifically include **preventive and protective measures** against biological risks in work environments.
- **Amendments to the Maritime Labour Convention, 2006 (MLC):**
  - The revised provisions of the MLC emphasize **seafarers' rights to shore leave and repatriation**, and formally recognize them as **key workers**.
  - The MLC is a legally binding global framework ensuring **minimum labour and living standards** for all seafarers aboard ships. Notably, **India ratified the MLC in 2015**.
- **Focus on Decent Work in the Platform Economy:**
  - For the first time, the ILC held a standard-setting discussion to improve labour conditions in the **digital platform economy**.
- **Resolution on Reducing Informality in Labour Markets:**
  - A resolution was adopted calling for **accelerated efforts to transition informal workers into formal employment**.
  - It advocates for improving **working conditions**, expanding **social protection**, and ensuring access to **decent jobs**, particularly for those most vulnerable to informal labour practices.
- **Other Decisions:**

- The ILC gave formal approval to the **ILO's tripartite engagement** in the upcoming **Second World Summit for Social Development**, scheduled for **November 2025 in Doha**.

Global Coalition for Social Justice Forum

- **Convened On:** The second edition of the Global Coalition for Social Justice Annual Forum was convened on June 12, 2025, alongside the 113th International Labour Conference (ILC).
- **Objectives**: Launched by the International Labour Organization (ILO) in 2023, the Coalition aims to mobilize global, regional, and national stakeholders to promote social justice through coordinated policy efforts and concrete actions.
- **Participants:** The forum featured wide-ranging participation from ministers, UN representatives, civil society organizations, employer and worker groups, private sector leaders, and academic experts.

Q. The **Maritime Labour Convention (MLC), 2006**, recently amended during the 113th ILC, is associated with which of the following? ***[UPSC Pre. Practice Question]***

(a) Protection of inland dock workers' rights

(b) Safety protocols for deep-sea mining

(c) Minimum labour and living standards for seafarers

(d) Rights of platform-based gig workers

Ans. (c) Minimum labour and living standards for seafarers

2.8. INTERNATIONAL INSTITUTE OF ADMINISTRATIVE SCIENCES (IIAS)

Why in The News?

India has been elected to the Presidency of the International Institute of Administrative Sciences (IIAS) for the 2025–2028 term — a significant milestone in its global governance journey.

About IIAS: The IIAS is a leading global federation promoting research and innovation in public administration. It includes 31 member countries, 20 national sections, and 15 academic research centres. Key members include India, Japan, Germany, China, Korea, South Africa, and others. While not formally part of the UN, IIAS works closely with UN bodies like CEPA and UNPAN.

India's Role: A member since 1998, India is represented by the Department of Administrative Reforms and Public Grievances. The presidency reflects global recognition of India's efforts in administrative reform, digital governance, and public service delivery.

Significance of India's Election to IIAS Presidency:

- Enhances India's global leadership in public administration.
- Showcases India's administrative reforms and digital governance.
- Strengthens international cooperation on governance best practices.
- Boosts India's soft power and global diplomatic presence.
- Aligns with India's vision of transparent, citizen-centric administration.

India's IIAS presidency reinforces its global role in shaping effective, inclusive, and reform-driven public administration.

Q. What is the significance of India's election to the Presidency of the International Institute of Administrative Sciences (IIAS) for global governance and India's administrative diplomacy? ***[UPSC MAINS Practice Question]***

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ECONOMY

3.1. NITI AAYOG RELEASES REPORT ON "DESIGNING A POLICY FOR MEDIUM ENTERPRISES"

Why in the News?

Recently, the NITI Aayog released the policy document ***"Designing a Policy for Medium Enterprises"*****,** outlining a strategic framework to position medium enterprises as pivotal drivers of India's industrial growth

Medium Enterprises at a Glance

Though accounting for only 0.3% of the MSME sector, medium enterprises contribute 40% of MSME exports, nearly 29% to GDP, and employ over 60% of the workforce—making them vital to India's economic self-reliance and global industrial competitiveness.

Current Challenges

Despite their potential, medium enterprises are constrained by systemic issues that limit their growth:

- **Limited access to tailored finance**: Most financial products cater either to small firms or large corporates.
- **Technology gap**: Adoption of Industry 4.0 solutions remains low.
- **R&D void**: Few enterprises have the means or support for innovation-led growth.
- **Testing infrastructure deficit**: Lack of sector-specific facilities raises compliance costs.
- **Skills mismatch**: Existing training does not reflect enterprise-specific needs.
- **Fragmented information access**: Digital portals are often difficult to navigate and underutilized.

Proposed Policy Interventions

The report lays out **six targeted strategies** to address these challenges and enable medium enterprises to thrive:

1. **Tailored Financial Solutions**- Turnover-linked working capital, a ₹5 crore credit card facility, and quicker fund disbursal via banks to enhance financial access.
2. **Technology Integration & Industry 4.0-** Tech centres to be upgraded into India SME 4.0 hubs, providing localized support for advanced and smart manufacturing technologies.
3. **R&D Promotion-** An R&D cell in the MSME Ministry will fund cluster-based innovation through the Self-Reliant India Fund.
4. **Cluster-Based Testing Infrastructure**- Sector-specific testing and certification centres will help reduce compliance costs and boost product standards.
5. **Custom Skill Development-** Training will be tailored to enterprise needs, with specialized modules added to existing ESDP programmes.
6. **Centralized Digital Portal-** A dedicated Udyam sub-portal will offer AI-based help, scheme discovery, and compliance tools for easy access to resources**.**

Vision for Viksit Bharat @2047

The report envisions medium enterprises as key drivers of India's development by 2047, urging inclusive policies and collaborative governance to transform them from the "missing middle" into the backbone of the nation's growth.

Q. Discuss the role of medium enterprises in achieving Viksit Bharat @2047 and the key challenges they face. How can targeted policy reforms help unlock their potential?

[UPSC MAINS Practice Question]

3.2. POVERTY FELL SIGNIFICANTLY LAST YEAR

Why in the News?

According to the latest **Household Consumption Expenditure Surveys (HCES)** conducted by the **National Statistical Office (NSO)** for 2022–23 and 2023–24, **India has witnessed a sharp decline in poverty** and a modest reduction in income inequality.

What is Poverty?

Poverty, the state of one who lacks a usual or socially acceptable amount of money or material possessions. Poverty is said to exist when people lack the means to satisfy their basic needs.

In India, poverty is measured by determining the number of people living **below the poverty line (BPL)**—a specified income threshold required to afford minimum subsistence.

Poverty lines differ across regions and time periods and are typically adjusted for inflation and cost of living. Internationally, the **World Bank** defines extreme poverty as living **less than $3 per day** (at 2021 PPP).

Trends in Poverty Reduction

India has seen a **substantial decline in poverty** over the last decade:

- Poverty fell from **29.5% in 2011–12** to **9.5% in 2022–23**, and further to **4.9% in 2023–24** (NSO).
- According to the **World Bank**, **extreme poverty** dropped from **16.2% in 2011–12** to **2.3% in 2022–23**.
- **Inequality**, as measured by the **Gini coefficient**, declined from **0.310 in 2011–12** to **0.253 in 2023–24**, with a sharp drop between 2022 and 2024.
- The data suggests that economic growth, rather than new welfare programs, played a leading role in poverty reduction.
- However, many of the poor remain close to the poverty line, indicating economic vulnerability despite the gains.

Government Measures to Combat Poverty

The Indian government has implemented a wide range of programs to **alleviate poverty, generate employment**, and **improve living standards**:

Employment and Income Support

- **MGNREGS (Mahatma Gandhi National Rural Employment Guarantee Scheme):** Guarantees 100 days of wage employment to rural households.
- **SGSY (Swarnajayanti Gram Swarozgar Yojana) and SJSRY (Swarna Jayanti Shahari Rozgar Yojana):** Promote self-employment in rural and urban areas.

Food Security and Nutrition

- **Targeted Public Distribution System (TPDS)** and **National Food Security Act (NFSA)** ensure food grain access to millions.
- **PM Garib Kalyan Anna Yojana:** Extended free food grain supply for another five years.
- **Poshan Abhiyan** and **Anemia Mukt Bharat:** Improve maternal and child health outcomes.

Basic Amenities and Infrastructure

- **Pradhan Mantri Ujjwala Yojana:** Provides clean cooking fuel to rural households.
- **Saubhagya Scheme:** Expands rural electricity coverage.
- **Swachh Bharat Mission** and **Jal Jeevan Mission:** Enhance sanitation and safe drinking water access.

Financial and Housing Inclusion

- **Pradhan Mantri Jan Dhan Yojana (PMJDY):** Drives financial inclusion with zero-balance bank accounts.
- **PM Awas Yojana:** Supports affordable housing for economically weaker sections.

India's sharp decline in poverty to below 5% reflects major progress toward inclusive growth. However, many remain near the poverty line. Sustained efforts in inclusive growth, robust social safety nets, and climate-resilient development are essential for lasting poverty reduction.

Q. *Despite India's success in reducing poverty levels to below 5%, economic vulnerability remains a concern. Examine* the limitations of poverty measurement methods in India and suggest ways to address the 'near-poor' population. ***[UPSC MAINS Practice Question]***

3.3. THE SEEDS OF SUSTAINABILITY FOR INDIA'S TEXTILE LEADERSHIP

Why in the News?

India's textile industry, a global giant, is under renewed focus amid rising sustainability demands, supply chain disruptions, and shifting consumer preferences. With fast fashion fading and conscious consumerism on the rise, sustainability is now key to maintaining global competitiveness.

India's Textile Legacy and Present Landscape

India has been a global textile powerhouse since ancient times, with its cotton and silk products highly valued across the world. After setbacks during colonial rule, the sector was revived post-independence with the establishment of mills and promotion of indigenous production.

Current Snapshot:

- Contributes **2.3% to GDP**, **13% to industrial output**, and **12% to exports**
- Employs **45 million people**, making it the second-largest employer after agriculture
- Exported **$34.4 billion** worth of textiles in FY 2023–24
- Serves over **100 countries**, holding a **4.5% share** in global textile trade
- Has a potential **$350 billion market** and scope to create **35 million new jobs by 2030**

Sustainability Challenges

Despite its strengths, India's textile sector faces major sustainability concerns:

- **Textile Waste & Circularity**: Contributes over **5% of global landfill waste**. Pre- and post-consumer waste management remains weak.
- **Water and Chemical Usage**: High water consumption and harmful chemicals like **NPEs** impact workers and ecosystems.
- **Carbon Footprint**: Heavy reliance on fossil fuels, with limited adoption of renewable energy.
- **Unsustainable Raw Materials**: Conventional cotton farming uses pesticides and excessive water, degrading soil health.

Other Structural Challenges

- **Volatile Raw Material Costs**: Fluctuating prices of cotton and synthetic fibers
- **Outdated Infrastructure**: Low levels of automation and modern machinery
- **Global Competition**: Pressure from low-cost producers like China, Bangladesh, and Vietnam
- **Skilled Labor Gap**: Need for upskilling across the workforce
- **Supply Chain Inefficiencies**: Logistics and export bottlenecks
- **Limited Market Access**: High tariffs and trade barriers hinder expansion

Policy and Industry Initiatives

- **ESG Task Force**: Set up by the Ministry of Textiles to embed environmental and social governance in policy.
- **PM MITRA Parks**: World-class manufacturing parks promoting sustainable infrastructure and renewable energy adoption.
- **Technology Upgradation Fund Scheme (TUFS)**: Supports energy-efficient machinery and reduces emissions.
- **Kasturi Cotton Initiative**: Focuses on high-quality, traceable, and ethically sourced Indian cotton.
- **National Technical Textiles Mission**: Advances eco-friendly materials and positions India as a leader in sustainable textiles.

Way Forward

India's textile sector stands at a pivotal moment. To remain globally competitive, the industry must go beyond token sustainability and adopt:

- **Regenerative agriculture**
- **Transparent, traceable supply chains**
- **Circular product design and waste reduction**

Strategic action today will determine whether India merely participates in the global textile trade—or leads it sustainably into the future.

Q. Which of the following initiatives aim to promote sustainability in India's textile sector?

1. Kasturi Cotton Initiative
2. PM MITRA Parks
3. National Technical Textiles Mission
4. SAMARTH Scheme

Select the correct answer using the code below: ***[UPSC Pre. Practice Question]***

(a) 1 and 2 only (b) 1, 2 and 3 only

(c) 1, 3 and 4 only (d) 1, 2, 3 and 4

Ans: (d) 1, 2, 3 and 4

3.4. INDIA'S GROWTH PARADOX

Why in the News?

India has recently emerged as the world's fourth-largest economy with a nominal GDP of $3.9 trillion. While this marks rapid economic progress, it also highlights deep concerns about unequal growth, widespread poverty, and limited employment opportunities—raising critical questions about whether prosperity is truly inclusive.

The Illusion of Growth: Is Bigger Always Better?

GDP vs. Reality of Lives Lived

While India's total economic size has grown, the **average per capita income remains just $2,800 (₹2.33 lakh/year)**. This is significantly lower than even smaller economies like **Vietnam ($4,300)** and far behind **China ($12,500)**. When adjusted for inequality, the average income for the bottom 95% drops dramatically to around **₹5,600/month**, which is barely above subsistence levels.

Staggering Wealth Inequality

- The **top 1%** of Indians hold over **40% of the nation's wealth**.
- The **top 5%** control a whopping **62%**.
  This extreme concentration means that the growth in GDP is disproportionately benefitting a small elite.

Poor Global Rankings Reflect Deep Social Fault Lines

- **Global Hunger Index**: 111th out of 125 countries
- **Human Development Index**: 134th, behind Sri Lanka and Vietnam
- **230 million Indians** live in **multidimensional poverty**
- **35% of children** are stunted — a sign of chronic undernutrition
- **80 crore people** depend on free ration schemes under the National Food Security Act (NFSA)

Distorted Picture Through the Dollar Lens

India's GDP is calculated in nominal dollar terms, which is highly sensitive to **exchange rate fluctuations**. A weakening rupee can reduce the economy's dollar value without any actual drop in real domestic output, leading to **misleading global comparisons**.

An Employment Crisis Amid Growth

Despite high GDP growth, **job creation remains inadequate**, especially in labour-intensive sectors.

- **Female Labour Force Participation Rate (LFPR)** is among the **lowest globally**.
- **Youth unemployment**, particularly among **graduates**, is **alarmingly high**, raising concerns about the skill-job mismatch and the structural nature of the crisis.

The Way Ahead: Toward Inclusive and Human-Centric Growth

1. **Redefine Success Beyond GDP**
   - Shift focus to **Human Development Indicators (HDI)**, including **health, education, nutrition, and gender equality**.
2. **Boost Labour-Intensive Sectors**
   - Invest in **MSMEs, rural industries**, and **social infrastructure** to create **broad-based, sustainable employment**.
3. **Decentralized, Grassroots Governance**
   - Strengthen **local bodies**, cooperatives, and **community-led planning** for more responsive and inclusive development.
4. **Align Growth with Environmental Justice**
   - Prioritize **climate action**, environmental protection, and **sustainable livelihoods** to ensure ecological balance alongside economic progress.

India's GDP growth is impressive on paper, but it masks deep-rooted **social, economic, and regional disparities**. To truly rise as a global power, India must now pivot from a **growth-at-all-costs model** to one that ensures **equity, sustainability, and dignity for all its citizens**.

Q. *"India's rapid GDP growth coexists with stark inequalities and developmental challenges, creating a paradox of progress."* Discuss the key manifestations of this paradox. Suggest policy measures to ensure that economic growth becomes inclusive, sustainable, and human-centric.

[UPSC MAINS Practice Question]

3.5. EMPOWERING WOMEN IN AGRICULTURE FOR FOOD SECURITY

Why in the News?

Recently, the **United Nations General Assembly has declared 2026 as the International Year of the Woman Farmer**. This initiative recognizes the critical role women play in global agriculture while drawing attention to the systemic challenges they face—especially around land rights, financial access, and market inclusion.

The Backbone of Global Agriculture

Women contribute immensely to food production and rural economies. Globally, they are responsible for **60–80% of food production in developing countries**. In Asia and the Pacific, **58% of the female labor force** works in agriculture. In India, **nearly 80% of rural women** are engaged in farming-related activities. Yet, only **10–20%** of women hold land rights, limiting their access to credit, subsidies, and decision-making.

Impact of Women Farmers

Food Security and Economic Stability

When given equal access to land, tools, and resources, women farmers can significantly boost agricultural output, diversify crops, and improve household nutrition. Their involvement also strengthens rural economies and community resilience.

Sustainable Farming

Women tend to adopt environmentally sound practices—conserving water, maintaining soil health, and managing resources wisely—contributing to long-term sustainability.

Persistent Challenges

Despite their contributions, women face barriers such as:

- **Limited land ownership** (only 14% in India),
- **Restricted access to credit and modern tools,**
- **Gender-biased agricultural policies,**
- **Heavy unpaid labor**, and
- **Cultural restrictions** that limit leadership and cooperative participation.

Policy and Programmatic Responses

Global Examples

- **Kenya's Women's Enterprise Fund** provides microloans and training.
- **Brazil's land reforms** support women's ownership.
- **Vietnam** offers mobile platforms for market access.

Indian Initiatives

- **Mahila Kisan Sashaktikaran Pariyojana (MKSP)** and **Krishi Sakhi** programs strengthen women's farming skills.
- **Self-Help Groups**, **PM Kisan Samman Nidhi**, and **Jan Dhan Yojana** ensure financial inclusion.

- **Digital tools** provide real-time market and weather updates.

Empowering women farmers is not only a matter of gender justice but a strategic necessity for **global food security and climate resilience**. As we approach the **International Year of the Woman Farmer in 2026**, governments and communities must invest in women's access to land, credit, education, and leadership. The future of sustainable agriculture depends on it.

Q. Discuss the role of women farmers in ensuring food security and sustainable agriculture. What are the key challenges faced by women in agriculture, and how can policy interventions address these challenges? ***[UPSC MAINS Practice Question]***

3.6. THE NEXT CENSUS: A CORNERSTONE FOR INDIA'S ECONOMIC STRATEGY

Why in the News?

India is preparing for **Census 2027**, a long-awaited exercise that was initially due in 2021 but postponed due to the COVID-19 pandemic. As the country's first **digital and caste-disaggregated Census since 1931**, it promises to be a game-changer in shaping economic, political, and social strategies.

What is the Census and Why It Matters?

The **Census is a decennial exercise** that provides a detailed snapshot of India's population—covering demographics such as age, gender, education, employment, and migration. Conducted by the **Office of the Registrar General and Census Commissioner under the Ministry of Home Affairs**, it forms the backbone for **economic planning, welfare delivery, and political representation**.

Highlights of Census 2027

- **First Digital Census**: Use of technology aims to enhance accuracy and efficiency.
- **Caste-Based Data**: For the first time since 1931, the Census will gather granular caste data beyond SCs and STs.
- **Foundation for Delimitation**: Census 2027 will be the basis for **redrawing parliamentary and assembly constituencies**, as mandated by **Article 82** of the Constitution.

Why Census data is crucial?

- **Policy & Welfare Schemes**: Programs like **PM-KISAN**, **MGNREGS**, and **PDS** depend on accurate population data.
- **Inflation & Monetary Policy**: Tools like the **Consumer Price Index** rely on Census inputs for inflation tracking.
- **Urban Development**: Helps plan housing, transport, and infrastructure, especially in rapidly growing cities.
- **Labor Market Trends**: Offers insights into employment patterns and skills gaps.
- **Private Sector Decisions**: Businesses use the data for market research and expansion strategies.

Challenges Ahead

- **Data Delays**: The last Census was in 2011, creating a critical information gap.
- **Undercounting Risks**: Migrants and marginalized groups are often missed.
- **Privacy Concerns**: Digital data collection raises fears of surveillance.
- **Political Sensitivity**: Caste and religion data could be politicized.
- **Information Overload**: Managing and interpreting massive datasets is a technical hurdle.

Census 2027 is not just a headcount—it's a mirror of India's evolving identity. If executed efficiently and transparently, it will be a powerful tool to drive inclusive growth, smarter governance, and better resource distribution in the decade ahead.

Q. Examine the significance of the upcoming Census 2027 in shaping India's economic, political, and social policies. Discuss the challenges associated with conducting a digital and caste-disaggregated census in the current context. ***[UPSC MAINS Practice Question]***

3.7. AGRI STACK UNDER DIGITAL AGRICULTURE MISSION (DAM)

Why in the News?

Recently, the Ministry of Agriculture & Farmers' Welfare held a National Conference on Agri Stack under the Digital Agriculture Mission (DAM), advancing India's digital push to improve farming through data-driven services.

Agri Stack and Digital Agriculture Mission: Transforming Indian Farming

What is Agri Stack?

A unified digital ecosystem that integrates farmer identities, land records, crop data, and government scheme benefits. It aims to personalize agricultural services and ensure efficient delivery of benefits from schemes like PM-KISAN, PMFBY (crop insurance), Kisan Credit Card (KCC), and Minimum Support Price (MSP) procurement.

- **Key Highlights from the Conference:**
  - Emphasis on linking digital land records with Aadhaar for accurate farmer identification.
  - Introduction of the Digitally Verifiable Credential (DVC) or Kisan Pehchan Patra, allowing farmers to generate verified digital credentials linked to specific land parcels and crops. These credentials are integrated with DigiLocker and dynamically updated with land mutations.
- **Government Support:**
  - Launch of Special Central Assistance (SCA) guidelines with ₹6,000 crore allocated to states:
    - ₹4,000 crore for building a comprehensive Farmer Registry, including legal heir information.
    - ₹2,000 crore for conducting Digital Crop Surveys.
- **Technological Innovation:** An AI-powered chatbot, developed using Google Gemini and trained on Agri Stack data, was showcased. It can answer farmers' queries in multiple languages, enhancing accessibility and support.

Digital Agriculture Mission (DAM): DAM serves as an umbrella initiative backing diverse digital agriculture projects, including:

- Building Digital Public Infrastructure (DPI) like Agri Stack
- Implementing the Digital General Crop Estimation Survey (DGCES)
- Supporting IT initiatives by central, state, and research institutions

DAM rests on two foundational pillars:

1. **Agri Stack** – A farmer-centric digital infrastructure streamlining service delivery and scheme access.
2. **Krishi Decision Support System (DSS)** – Integrates remote sensing data on crops, soil, weather, and water into a geospatial platform for informed agricultural decision-making.

Benefits of the Digital Agriculture Mission:

- Enables digital authentication, reducing paperwork and physical visits.

- Improves transparency and efficiency in delivering schemes, insurance, and loans with accurate crop data.
- Facilitates crop mapping for disaster response and insurance claim processing.
- Builds digital infrastructure to optimize agricultural value chains and offer customized advisory services on crop health, pest management, irrigation, and planning.

Agri Stack and the Digital Agriculture Mission mark a significant step towards modernizing Indian agriculture through technology, ensuring targeted benefits, improving transparency, and empowering farmers for a more resilient and sustainable future.

Q. Discuss the potential of Agri Stack and DAM in transforming Indian agriculture along with implementation challenges. ***[UPSC MAINS Practice Question]***

3.8. THE COST OF RISING IMPORTS

Why in the News?

Despite the existence of a government-declared Minimum Support Price (MSP), many farmers are compelled to sell their pulses at lower prices in open markets due to insufficient government procurement, even as a surge in imports further depresses domestic prices.

Key Highlights About Pulses

- **Definition and Nature:** Pulses are dry grains harvested from leguminous plants belonging to the Fabaceae (Leguminosae) family. They are protein-rich, high in dietary fiber, low in fat, and contribute to soil fertility by fixing atmospheric nitrogen. Pulses also have excellent shelf life when stored dry.
- **Ideal Growing Conditions:** These crops require temperatures ranging from 20°C to 27°C, rainfall between 25–60 cm, and prefer sandy-loamy soils. Pulses are grown during both Rabi and Kharif seasons.
- **Rabi Pulses:** Contributing over 60% to total output, major Rabi pulses include gram (chickpea), chana (Bengal gram), and masoor (lentil), which thrive in cooler sowing conditions and need warmth for harvest.
- **Kharif Pulses:** Commonly grown varieties include moong (green gram), urad (black gram), and arhar (pigeon pea), which require warm temperatures throughout the growing period.

India's Position in Pulse Production

- India holds the distinction of being the largest producer (25%), consumer (27%), and importer (14%) of pulses globally. Leading producing states include Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh, and Karnataka.
- Pulses cover 20% of India's food grain cultivation area but contribute only 7–10% to total food grain output. Gram dominates at 40% of the total production, followed by arhar/tur (15–20%), and urad and moong (each at 8–10%).

Trends in Pulses Import

- In 2024–25, India's pulse imports surged to a record **7.3 million tonnes**, valued at **USD 5.5 billion**, surpassing the 2016–17 peak. Key suppliers included Canada, Russia, Australia, Myanmar, Mozambique, Tanzania, and the United States.
- Following 2017–18, annual imports averaged 2.6 million tonnes (worth USD 1.7 billion). However, a drought linked to El Niño in 2023–24 reduced domestic output to 24.2 million tonnes. Though production partially rebounded to 25.2 million tonnes in 2024–25, dependence on imports remained high.

Major Constraints Affecting Pulse Production

- **Policy and MSP Disadvantages:** Government price support and subsidies predominantly favor paddy and wheat, drawing attention and resources away from pulses. Additionally, erratic procurement practices for pulses discourage their cultivation.
- **Climate-Related Risks:** Since pulses are primarily grown in non-irrigated, rain-fed regions, they are more vulnerable to weather extremes such as droughts, unseasonal rains, and erratic monsoons, in comparison to cereals.
- **Low Productivity:** India's average pulse yield is about 660 kg per hectare, significantly below the global average of 909 kg/ha. Contributing factors include poor seed quality, lack of high-yielding varieties (HYVs), and limited use of modern farming techniques.
- **Fragmented Land Holdings:** A majority of pulse growers are small or marginal farmers owning less than 2 hectares, restricting their ability to invest in inputs like irrigation, better seeds, and fertilizers.
- **Pests and Soil Issues:** Due to their high nutrient content, pulses are more susceptible to pest infestations. They also face soil-related challenges such as salinity and micronutrient deficiencies, worsened by limited access to affordable crop protection.

Government Initiatives to Promote Pulses

- National Mission on High Yielding Seeds
- National Food Security Mission (NFSM) – Pulses
- Pradhan Mantri Annadata Aay SanraksHan Abhiyan (PM-AASHA)
- National Mission on Sustainable Agriculture (NMSA)
- Rashtriya Krishi Vikas Yojana (RKVY)

Suggested Measures for Self-Reliance in Pulses

- **Enhance Productivity:** Encourage the adoption of high-yield, climate-resilient, and nutrient-rich pulse varieties like iron-fortified lentils and pigeon pea hybrids. Expand the use of micro-irrigation (drip and sprinkler systems) and utilize rice fallow land for post-Kharif pulse cultivation.
- **Adopt Precision Farming:** Implement soil health cards, AI-enabled pest control tools, and sensor-based irrigation to improve efficiency.
- **Reform Policy and MSP Framework:** Ensure reliable and timely MSP procurement and extend PM-AASHA coverage. Redirect subsidies from water-intensive crops to pulses and offer incentives for crop diversification.
- **Improve Post-Harvest Infrastructure:** Develop modern storage facilities such as silos and hermetically sealed systems to reduce losses. Promote local-level processing units like mini dal mills and support value addition.
- **Market Reforms:** Encourage the formation and strengthening of Farmer Producer Organizations (FPOs) to facilitate direct market access and reduce dependency on intermediaries.
- **Strengthen Research and Extension Services:** Invest in R&D for short-duration, high-yield varieties such as early-maturing moong. Expand the role of Krishi Vigyan Kendras (KVKs) to disseminate knowledge on intercropping, zero tillage, and Integrated Pest Management (IPM).
- **Establish a Dynamic Buffer Stock:** Maintain a rolling buffer stock of 2.5 to 3 million tonnes to stabilize market prices. Use import tariffs strategically—raise them in surplus years and reduce them during shortfalls.

Despite achieving record levels of pulse production, Indian farmers remain vulnerable due to inconsistent procurement, climate-related disruptions, and growing imports. Achieving true self-sufficiency in pulses demands a comprehensive strategy involving policy shifts, improved procurement systems, better varieties, research support, and enhanced storage and market infrastructure.

Q. What are the key challenges faced by pulse farmers in India? How can government policies be improved to support pulse production effectively? ***[UPSC MAINS Practice Question]***

3.9. REVERSE FLIPPING

Why in the News?

The Securities and Exchange Board of India (SEBI) recently announced a slew of measures aimed at reducing the compliance burden in the stock market ecosystem, encouraging more companies to list in India after reverse flipping, and facilitating greater foreign investment in government bonds.

Flipping vs Reverse Flipping: Explained

- **Flipping** refers to the practice where an Indian company transfers its ownership and key assets—such as intellectual property—to a foreign-incorporated entity, even though its operations, market, and personnel remain largely in India. This results in the Indian firm becoming a wholly owned subsidiary of the overseas entity.
  - **Startups typically opt for flipping due to**:
    - **Tax advantages** offered by countries like Singapore, UAE, Cayman Islands, UK, and the US
    - **Access to global capital markets**
    - **Better branding and international reach**
    - **Higher valuations**
    - **Stronger intellectual property protection**
- **Reverse Flipping** (also known as **internalisation**) is the process of a foreign-incorporated startup relocating its base back to India.
  - Startups are increasingly reversing their flips due to:
    - The **possibility of listing** on Indian stock exchanges to tap into domestic retail investors
    - India's **sound economic policies**
    - A **growing consumer base**
    - **Rising investor confidence** in the Indian startup ecosystem.
  - There are multiple methods to execute a reverse flip, with the two most common being: **Inbound Mergers and Share Swap Arrangements**

Q. Which of the following best describes the term "Reverse Flipping" in the context of Indian startups? ***[UPSC Pre. Practice Question]***

(a) Transferring ownership of a foreign company to an Indian government entity

(b) Setting up shell companies abroad to avoid taxation

(c) A foreign-incorporated startup shifting its base of operations and domicile back to India

(d) Converting a public limited company into a private limited company for ease of regulation

Ans. (c) A foreign-incorporated startup shifting its base of operations and domicile back to India

3.10. NEWS IN SHORTS

3.10.1. INDIA MARKS A RELATIVE DECLINE IN GENDER PARITY, RANKS 131 WORLDWIDE

Why in the News?

The **World Economic Forum (WEF)** has released the **2025 edition of its Global Gender Gap Report**, revealing slow and uneven progress toward gender equality worldwide. The findings underscore persistent disparities, especially in economic and political representation.

Global Highlights

- **Overall Progress**: The world has closed **68.5%** of the gender gap — a slight improvement from last year.
- **Top Performers**: **Iceland** tops the list for the 16th year, achieving over **90% parity**, followed by **Finland**, **Norway**, and the **UK**.
- **Time to Equality**: At the current pace, full global gender parity will take **123 years**.

India's Performance

- **Rank**: India fell to **131st out of 148 countries**, with a parity score of **64.1%**.
- **Economic Participation**: Slight improvement to **40.7%**, with marginal gains in income parity.
- **Education**: Strong showing with **97.1% parity**, reflecting improved literacy and higher education access.
- **Health**: Minor gains in sex ratio and healthy life expectancy.
- **Political Empowerment**: Continued decline — women in Parliament fell to **13.8%**, and in ministerial roles to **5.6%**, down from **30% in 2019**.

Regional Snapshot

- **South Asia**: India trails behind **Bangladesh (24)**, **Nepal (125)**, and **Sri Lanka (130)**.
- **Europe**: Leads globally with **76.3% parity**.
- **Middle East and North Africa (MENA) Region**: Lowest parity at **62.6%**, facing deep structural and cultural barriers.

Key Concerns

- **Persistent Wage Gaps**: Women continue to earn significantly less than men across sectors.
- **Slow Political Progress**: Representation of women in leadership roles remains weak.
- **Stark Regional Inequalities**: South Asia and MENA remain the most unequal regions, highlighting the need for urgent, targeted reforms.

The 2025 Global Gender Gap Report highlights modest global progress but warns that entrenched disparities—particularly in politics and the economy—require **accelerated action and policy reform** to ensure equitable opportunities for women worldwide.

Q. With reference to the 2025 Global Gender Gap Report released by the World Economic Forum, consider the following statements:

1. India's overall gender parity score has improved significantly from the previous year.
2. Political empowerment is the strongest performing sub-index for India.
3. South Asia is among the regions with the lowest gender parity globally.
4. Iceland continues to top the Global Gender Gap Index in 2025.

Which of the statements given above are correct? ***[UPSC Pre. Practice Question]***

(a) 1 and 2 only (b) 3 and 4 only

(c) 2 and 3 only (d) 1, 2 and 4 only

Ans: (b) 3 and 4 only

3.10.2. INDIA'S SOCIAL SECURITY COVERAGE JUMPS TO 64.3%, RANKS 2ND GLOBALLY: ILO

Why in the News?

According to the **latest ILOSTAT data from the International Labour Organization (ILO), India's social security coverage rose to 64.3% in 2025**, up from 19% in 2015, covering over **94 crore people**. India now ranks **2nd globally** in social protection coverage.

What is Social Security?

Social security (or social protection) refers to the system of safeguards a society provides to ensure **healthcare access** and **income security**—especially during **old age**, **illness**, **unemployment**, **disability**, or **maternity**.

It is built on **three core pillars**:

1. **Social Assistance** (e.g., direct welfare schemes)
2. **Social Insurance** (e.g., contributory pension, health cover)
3. **Labour Market Programs** (e.g., skill-building and employment support)

Key Government Initiatives

- **Atal Pension Yojana:** Offers a fixed monthly pension between ₹1,000 and ₹5,000 after the age of 60 for informal sector workers.
- **Ayushman Bharat (PM-JAY):** Health insurance scheme targeting poor and vulnerable families for access to quality healthcare.
- **MGNREGA:** Guarantees 100 days of wage employment annually to rural households, promoting livelihood security.
- **PM POSHAN:** Provides nutritious mid-day meals to schoolchildren to improve health and learning outcomes.
- **PDS / NFSA:** Supplies subsidized food grains to ensure food and nutritional security for vulnerable populations.

India's rapid expansion in social security coverage reflects growing state support for inclusive welfare and resilience, particularly for the informal and vulnerable workforce.

Q. India's social security coverage has risen significantly, now ranking second globally. Examine the role of key government initiatives in expanding social protection, and discuss the challenges that remain in achieving universal and comprehensive social security for all.

[UPSC MAINS Practice Question]

3.10.3. TURMERIC FARMING

Why in the News?

Turmeric farming has emerged as a **new way to thwart wild animal threats in Munnar**. Last year, two acres of turmeric were cultivated under the Munnar forest division, Kerla, yielding rich returns.

Background of the News

- Turmeric farming helps **thwart wild animal intrusions**, especially by elephants and wild boars, as animals tend to avoid turmeric fields.
- In 2025, the initiative has expanded to 55.56 acres across settlements in **Chinnar Wildlife Sanctuary, Eravikulam**, and **Anamudi National Parks.**

- **Livelihood Support:** Supported by the **Anamudi Forest Development Agency**, the project aids tribal incomes and ensures a **guaranteed market** via the Forest Department's '**Chilla**' weekly market.
- **Agroecological Innovation:** Introduced in **12 tribal settlements**, with high-yield and local turmeric varieties such as **"Pragathi"** in use.

About Turmeric

- A rhizome (underground stem), popularly known as the **"Golden Spice".**
- **Curcumin**, **its active compound**, has antioxidant and anti-inflammatory properties.
- **Uses:** Traditionally used for treating disorders of the skin, joints, digestion, and respiratory system.
- Functions as a **natural pH indicator**, changing color with acidity/alkalinity.

Climatic & Soil Requirements

- **Climate:** Grows in diverse tropical conditions.
- **Temperature:** 20°C–35°C
- **Rainfall:** 1500 mm or more annually
- **Soil:** Thrives in well-drained sandy or clay loam soils

Turmeric Production in India (2023–24)

Parameter	Details
Area under Cultivation	3.05 lakh hectares
Varieties Grown	Over 30 varieties
India's Share in Global Production	~70% of the world's turmeric
Major Producing States	Telangana, Maharashtra, Tamil Nadu, Andhra Pradesh
Contribution by Major States	63.4% of India's total turmeric production
India's Share in Global Export	> 62% of global turmeric trade
Top Export Markets	Bangladesh, UAE, USA, Malaysia

Turmeric with GI Tags in India:

- **Maharashtra**: Sangli Turmeric, Waigaon Turmeric
- **Tamil Nadu**: Erode Manjal (Erode Turmeric)
- **Meghalaya**: Lakadong Turmeric

National Turmeric Board (NTB)

- **Established**: 2023
- **Headquarters**: Nizamabad, Telangana
- **Ministry**: Ministry of Commerce & Industry
- **Objective**:
  - Increase **farm-level value addition**
  - Improve **export competitiveness**
  - Promote research, market development, value addition.
  - Ensure better prices and wellbeing of turmeric growers.
- **Composition**:
  - Chairperson (appointed by Centre)
  - Members from Ministries (AYUSH, Pharma, Agriculture, Commerce)

- Representatives from three state govts (on rotation)
- Turmeric farmers, exporters, and research institutions
- Secretary appointed by Dept. of Commerce

Q. Consider the following statements regarding turmeric production in India:

1. India contributes over 70% to global turmeric production.
2. Telangana is among the top turmeric-producing states.
3. Lakadong Turmeric with GI tag is produced in Tamil Nadu.
4. The National Turmeric Board was established under the Ministry of Agriculture & Farmers Welfare.

Which of the above statements is/are correct? ***[UPSC Pre. Practice Question]***

(a) 1 and 2 only (b) 1, 2, and 3 only

(c) 1, 2, and 4 only (d) 2 and 4 only

Ans. (a) 1 and 2 only

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SECURITY

4.1. INDIAN NAVY SET TO COMMISSION INS ARNALA, FIRST IN ASW-SWC SERIES

Why in the News?

The Indian Navy **commissioned** INS Arnala, the country's first indigenously designed and built **Anti-Submarine Warfare Shallow Water Craft (ASW SWC)**, at the **Visakhapatnam Dockyard** under the **Eastern Naval Command** on Wednesday.

About INS Arnala

- INS Arnala is the first in a series of **16 Anti-Submarine Warfare Shallow Water Craft (ASW-SWC)** being inducted into the Indian Navy.
- Named after the historic **Arnala Fort** of Maharashtra's coast, known for its strategic maritime value during the Maratha and Portuguese eras.

Design & Indigenous Development

- Designed by **Garden Reach Shipbuilders & Engineers (GRSE)**, Kolkata, in partnership with L&T Shipbuilders.
- Boasts over 80% indigenous components, reinforcing the vision of **'Aatmanirbhar Bharat'.**

Technical Specifications

- **Length:** 77.6 meters
- **Displacement:** Over 1,490 tonnes
- **Propulsion:** Largest Indian naval ship powered by a diesel engine–waterjet propulsion system.

Operational Role & Capabilities

- Specially crafted for anti-submarine warfare in shallow waters.
- Also capable of:
  - Subsurface surveillance
  - Search and rescue missions
  - Low-Intensity Maritime Operations (LIMO)
  - Mine-laying tasks

Q. With reference to INS Arnala, consider the following statements:

1. It is the first in a series of 16 Anti-Submarine Warfare Shallow Water Crafts (ASW-SWC).
2. It is equipped with nuclear propulsion technology.
3. It has over 80% indigenous content.
4. It was designed solely by the Indian Navy's internal design bureau.

Which of the statements given above are correct? ***[UPSC Pre. Practice Question]***

(a) 1 and 3 only (b) 2 and 4 only

(c) 1, 2 and 3 only (d) 1, 3 and 4 only

Ans. (a) 1 and 3 only

4.2. OPERATION SINDHU

Why in the News?

In response to the intensifying conflict between Iran and Israel, the Government of India launched **Operation Sindhu** in 2025 to secure the safe return of its citizens from Iran. This operation underscores India's commitment to protecting its diaspora during global crises, a hallmark of its foreign policy.

Overview of Operation Sindhu

Operation Sindhu is a meticulously planned initiative to evacuate Indian citizens from Iran, where rising military tensions have created an unstable environment. The operation integrates air and land routes to facilitate the safe repatriation of citizens, particularly students, to India.

Key Features of the Operation

- **Initial Evacuation Phase**: The first stage focused on relocating Indian students from northern Iran to Armenia via secure land routes. From Yerevan, the capital of Armenia, special flights were arranged to transport evacuees to New Delhi.
- **Coordination and Support**: The Ministry of External Affairs (MEA) is spearheading the operation, with Indian missions in Tehran and Yerevan working in tandem. A 24/7 control room in New Delhi has been established to monitor developments, provide real-time assistance, and coordinate logistics.
- **Multi-Modal Evacuation Strategy**: The operation leverages both land corridors (e.g., Iran-Armenia border) and potential maritime routes through the Persian Gulf, involving airlifts via friendly Gulf nations like Saudi Arabia and Kuwait.

Geopolitical Challenges and Strategic Navigation

The volatile situation in West Asia presents significant challenges for Operation Sindhu, requiring India to carefully navigate regional dynamics to ensure the safety of its citizens.

Diplomatic Strategies

- **Leveraging Friendly Relations**: India is utilizing its strong diplomatic ties with nations like Armenia, Turkmenistan, and Iraq to secure safe evacuation routes. The successful use of the Iran-Armenia border exemplifies this approach.
- **Navigating Complex Relations**: Strained ties with some of Iran's neighbors, such as Turkey, Azerbaijan, and Pakistan, as well as the lack of formal diplomatic relations with Afghanistan's current regime, restrict viable land exit options.
- **Exploring Maritime Options**: To circumvent limitations on land routes, India is exploring evacuation through the Persian Gulf, potentially via sea or airlifts through cooperative Gulf countries.

India's Legacy of Evacuation Operations

Operation Sindhu is the latest in a series of successful evacuation missions undertaken by India, reflecting its robust disaster management and foreign policy framework. Below is a table summarizing key Indian evacuation operations:

Operation	Year	Location	Context
Operation Sindhu	2025	Iran	Evacuation amid Iran-Israel conflict
Operation Kaveri	2023	Sudan	Evacuation during military clashes
Operation Ajay	2023	Israel	Evacuation during Israel-Hamas conflict
Operation Ganga	2022	Ukraine	Evacuation during Russia-Ukraine war
Operation Devi Shakti	2021	Afghanistan	Evacuation after Taliban takeover
Operation Samudra Setu	2020	Various (via sea)	Evacuation during Covid-19 pandemic
Operation Raahat	2015	Yemen	Evacuation during civil conflict
Operation Safe Homecoming	2011	Libya	Evacuation during Arab Spring civil war

Significance of Operation Sindhu

Operation Sindhu reinforces India's commitment to the welfare of its global diaspora, a key pillar of its foreign policy. The operation's success hinges on India's diplomatic influence, its ability to engage with diverse regional actors, and its logistical prowess in executing large-scale evacuations. By drawing on lessons from past operations like Ganga, Kaveri, and Ajay, India showcases its capacity to respond swiftly and effectively to international crises.

Key Takeaways

- **Diplomatic Agility**: India's ability to navigate complex regional dynamics ensures safe evacuation routes.
- **Logistical Efficiency**: The use of multi-modal evacuation strategies highlights India's operational capabilities.
- **Global Image**: Successful evacuations enhance India's reputation as a responsible global actor.

Way Forward

To strengthen future evacuation efforts, India should:

1. **Institutionalize Protocols**: Develop standardized procedures for crisis evacuations, incorporating lessons from past operations.
2. **Enhance Technology Use**: Utilize digital platforms like the MADAD portal and real-time tracking systems to streamline coordination.
3. **Strengthen Regional Ties**: Deepen diplomatic engagement with West Asian nations to secure reliable evacuation corridors.
4. **Build Diaspora Databases**: Maintain updated records of Indian citizens abroad to facilitate rapid response during crises.

Operation Sindhu exemplifies India's strategic and humanitarian commitment to protecting its citizens during global crises. By leveraging diplomatic ties, logistical expertise, and lessons from past operations, India continues to strengthen its disaster management framework.

Q. What are the key strategic and humanitarian considerations behind India's launch of Operation Sindhu amid the Iran-Israel conflict? Examine how such operations enhance India's role as a responsible global actor. ***[UPSC MAINS Practice Question]***

4.3. SIPRI REPORT 2024

Why in the News?

The *Stockholm International Peace Research Institute (SIPRI) Yearbook 2025*, released on June 24, reveals that India now possesses more nuclear warheads than Pakistan. The report also highlights that China maintains a significantly larger arsenal, surpassing both countries combined.

About SIPRI Yearbook 2025

- The SIPRI Yearbook 2025, published by Oxford University Press on behalf of the Stockholm International Peace Research Institute (SIPRI), offers a comprehensive overview of global security dynamics.
- It combines original data on key areas such as world military expenditure, international arms transfers, arms production, nuclear forces, armed conflicts, and multilateral peace operations. Alongside this, it presents cutting-edge analysis on critical issues in arms control, peacebuilding, and international security policy.

About SIPRI

SIPRI founded in 1966, is an independent global institute focused on research related to conflicts, weapons, arms control, and disarmament.

It offers data, insights, and policy recommendations derived from publicly available sources to inform policymakers, scholars, the media, and the general public.

Key Highlights from SIPRI Yearbook 2025

- **Global Trends in Nuclear Stockpiles**
  - Since the Cold War's conclusion, the total number of nuclear warheads has steadily declined.
  - However, several countries are now expanding their arsenals, with China leading the pace, increasing its stockpile to at least 600 nuclear warheads.
  - India has increased its arsenal from 172 to 180 warheads, thereby surpassing Pakistan, which has an estimated 170 warheads as of January 2025.
- **Modernization of Nuclear Arsenals**
  - **All nine nuclear-armed nations—**including the US, Russia, China, India, Pakistan, Israel, France, the UK, and North Korea—continued modernising their nuclear weapons in 2024, upgrading both delivery systems and warhead designs.
- **Fissile Material Production**
  - The core materials used in nuclear warheads, namely highly enriched uranium (HEU) and separated plutonium, remain central to nuclear capabilities:
  - China and Pakistan have produced both HEU and plutonium.
  - India and Israel primarily rely on plutonium for their nuclear weapons programs.
- **Emerging Security Concerns**
  - The report highlights that rapid advancements in technologies such as AI, cyber warfare, space-based assets, missile defence, and quantum computing are introducing new risks and instabilities to global security.
  - It also warns that the arms control regime is deteriorating, with no agreements in place to renew or replace key treaties like New START, set to expire in early 2026.

Key Global Treaties and India's Position

Treaty	Year	Objective	India's Status
Partial Test Ban Treaty (PTBT)	1963	Bans nuclear weapon tests in the atmosphere, outer space, and underwater	**Signed and ratified**
Treaty on the Non-Proliferation of Nuclear Weapons (NPT)	1970	Legally binding treaty aimed at nuclear disarmament and non-proliferation	**Never joined**
Comprehensive Nuclear Test Ban Treaty (CTBT)	1996	Prohibits all nuclear explosions, both military and peaceful	**Did not sign**
New START Treaty	2011	Bilateral nuclear arms reduction treaty between the USA and Russia	Not applicable to India
Treaty on the Prohibition of Nuclear Weapons (TPNW)	2017	Complete ban on development, testing, and use of nuclear weapons	**Did not sign**

Q. Despite being a non-signatory to major global disarmament treaties, India continues to expand and modernize its nuclear arsenal. Critically analyze the strategic rationale behind this policy and its implications for regional and global security. ***[UPSC MAINS Practice Question]***

4.4. NEWS IN SHORTS

4.4.1. OPERATION RISING LION

Why in the News?

Following the IAEA's first resolution in two decades accusing Iran of nuclear non-compliance, Israel launched **Operation Rising Lion**—a coordinated military offensive aimed at dismantling Iran's nuclear and missile infrastructure.

Israel's Shift in Strategy: Describing the operation as an "existential battle," Israel has moved from targeting Iran-backed proxies to directly attacking Iran, which it sees as the root of regional instability. Despite years of strikes on groups like **Hamas, Hezbollah, Houthis**, and **PMF**, Israel has been unable to neutralize their threat. The new approach aims to cripple Iran's capacity to sustain this **"Axis of Resistance."**

Iran's Proxy Warfare Model: Iran has long avoided direct conflict, instead building a vast network of armed non-state actors across **Palestine, Lebanon, Iraq, Yemen**, and beyond. This has allowed Tehran to:

- Project power with plausible deniability
- Stretch Israel's military across multiple fronts
- Avoid full-scale retaliation — until now

Wider Strategic Implications

- **Regional War Risk**: Iran's proxies may retaliate, opening multiple conflict zones and drawing the region into a broader war.
- **Fragile States at Risk**: Lebanon, Syria, Iraq, and Yemen could face further destabilization and humanitarian crises.
- **Global Economic Shock**: Key maritime chokepoints like the **Strait of Hormuz** may be disrupted, threatening energy supply chains and driving up oil prices.

- **Collapse of Nuclear Talks**: The JCPOA revival is now unlikely, possibly pushing Iran to pursue nuclear weapons more aggressively.
- **Middle East Arms Race**: Gulf states may seek nuclear deterrents, accelerating regional militarization.
- **Shifting Alliances**: Arab states wary of Iran may deepen quiet cooperation with Israel; Turkey and Russia could also recalibrate their roles.

India's Concerns

- **Energy Security**: Over 60% of India's crude oil is sourced from the Middle East — any disruption could inflate prices and widen the current account deficit.
- **Diaspora Safety**: Millions of Indians work in Gulf nations; escalation may force evacuations and impact remittances.
- **Strategic Balancing**: India must maintain diplomatic neutrality while protecting economic and regional interests across **Israel, Iran, and the Arab world**.

Israel's direct strike on Iran marks a dangerous escalation in a long-simmering conflict, with far-reaching consequences for the Middle East and beyond — including global energy markets and India's strategic calculus.

Q. *"Operation Rising Lion marks a significant shift in Israel's security doctrine with global repercussions."* Analyze the strategic rationale behind Israel's direct strike on Iran. What are the implications of this escalation for regional stability, global energy security, and India's foreign policy? ***[UPSC MAINS Practice Question]***

4.4.2. EXERCISE SHAKTI-2025

Why in the News?

The **8th edition of Exercise SHAKTI-2025**, a bilateral joint military exercise between **India and France**, is set to take place at **La Cavalerie, France**.

About Exercise SHAKTI

- **Launched**: 2011
- **Type**: Biennial Indo-French **Army** exercise
- **Last Edition**: Held in **May 2024** in **Meghalaya, India**
- **Objective**: To enhance joint operational capabilities in **multi-domain sub-conventional warfare**, conducted under **Chapter VII of the UN Charter** (peace enforcement operations).

Did You Know?

- **Exercise VARUNA**: Annual **naval** drill between the **Indian Navy and French Navy**.
- **Exercise GARUDA**: **Air exercise** between the **Indian Air Force (IAF)** and the **French Air and Space Force (FASF)**.

Exercise SHAKTI underscores the growing defence cooperation between India and France, aimed at strengthening interoperability and joint readiness in complex operational environments.

Q. *"Joint military exercises like Exercise SHAKTI reflect growing strategic convergence between India and France."* Discuss the significance of Indo-French defence cooperation in the evolving Indo-Pacific security architecture. Highlight the role of bilateral exercises in enhancing interoperability and strategic trust. ***[UPSC MAINS Practice Question]***

4.4.3. INDIA TO GET REMAINING S-400 UNITS BY 2026: RUSSIA

Why in the News?

India will receive the remaining S-400 Triumf air defence units from Russia by 2025–2026. With four squadrons already deployed in key areas like Pathankot, Rajasthan, and Gujarat, the system bolsters India's defence against regional threats.

The S-400 Triumf: The S-400 is one of the world's most advanced surface-to-air missile (SAM) systems developed by Russia. It is designed to counter a wide range of aerial threats including fighter jets, ballistic missiles, cruise missiles, and drones. Equipped with multi-function radars, mobile launchers, and an integrated command centre, the system represents cutting-edge defence technology.

Key Capabilities

- **Range & Altitude:** Can strike targets up to 400 km away and at altitudes between 10 m and 30 km.
- **Simultaneous Targeting:** Tracks 80 targets and engages up to 36 at once.
- **Missile Arsenal:** Includes four types:
  - **40N6 (400 km)**
  - **48N6 (250 km)**
  - **9M96E2 (120 km)**
  - **9M96E (40 km)**
- **Radar Suite:**
  - *91N6E "Big Bird"* for long-range detection
  - *92N6E "Grave Stone"* for targeting
  - Integrated by the *55K6E* command module

Mobility and Speed Superiority

Mounted on mobile platforms, the S-400 can be repositioned swiftly and deployed in just five minutes—far quicker than the U.S. Patriot system, which takes around 25 minutes. The S-400's missiles travel at speeds up to 4.8 km/sec, outperforming both Patriot and THAAD systems in speed and flexibility.

Strategic Importance for India

Signed in 2018 despite CAATSA-related sanctions threats from the U.S., India's ₹35,000 crore deal with Russia for five S-400 squadrons reflects a commitment to autonomous defence decisions. The system enhances India's preparedness, especially against threats from China and Pakistan, and will be stationed along sensitive zones like the northeast frontier.

The S-400 Triumf, with its unmatched range, speed, and multi-layered defence capability, acts as India's modern-day *Sudarshan Chakra*. Its strategic deployment not only strengthens India's air defence grid but also signals a robust, independent security posture in a geopolitically complex neighbourhood.

Q. India's acquisition of the Russian S-400 Triumf system reflects its pursuit of strategic autonomy in defence. Discuss the capabilities of the S-400 system and analyze its significance in strengthening India's air defence in the current geopolitical context.

[UPSC MAINS Practice Question]

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ENVIRONMENT

5.1. WMO'S LATEST DECADAL CLIMATE FORECAST REPORT (2025–2029)

Why in the News?

According to a new report from the World Meteorological Organization (WMO) latest decadal climate forecast report (2025–2029), Global climate predictions show temperatures are expected to continue at or near record levels in the next five years, increasing climate risks and impacts on societies, economies and sustainable development,

Key messages

- The **World Meteorological Organization (WMO)** forecasts that global temperatures between **2025 and 2029** are likely to remain alarmingly high, with **annual average temperatures** projected to be **1.2°C to 1.9°C above pre-industrial levels (1850–1900)**.
- There is an **80% probability** that **at least one year** in this period will **break 2024's record** as the **warmest year** ever.
- An **86% chance** exists that one or more years will **exceed the critical 1.5°C threshold**, even if temporarily.
- The likelihood of the **five-year average** breaching 1.5°C has **risen sharply to 70%**, from 47% in last year's outlook.

Regional Extremes: More Heat, Less Ice

- The polar and sub-polar regions are likely to be hit hardest:
- **Arctic warming** is projected to be **2.4°C above** the recent 30-year average (1991–2020)—**3.5 times** the global rate.
- Further **reduction in sea ice** is expected across the **Barents Sea**, **Bering Sea**, and **Sea of Okhotsk** during spring months.
- Monsoonal regions like **South Asia** are likely to continue experiencing **wetter-than-average years**, though not uniformly across all seasons.

Global Precipitation Trends

From **May to September (2025–2029)**, forecasts suggest:

- **Wetter conditions** in the **Sahel**, **northern Europe**, **Alaska**, and **northern Siberia**.
- **Drier trends** over the **Amazon Basin**, raising concerns for carbon sinks and biodiversity.

Compounding Impacts

The consequences of even minor temperature increases are far from negligible:

- Escalation in **extreme weather events**: heatwaves, floods, cyclones, droughts.
- **Accelerated melting** of glaciers and ice sheets, contributing to **sea-level rise**.
- **Ocean warming** and acidification threatening marine life and coastal economies.
- Increased **climate-induced displacement**, health risks, and stress on public infrastructure.

The WMO Deputy Secretary-General Ko Barrett emphasized, *"There is no sign of respite over the coming years. The impacts will increasingly touch our economies, ecosystems, and daily lives."*

Paris Agreement and the 1.5°C Threshold

The **Paris Agreement** refers to **long-term global warming**, measured over **20-year periods**:

- The **1.5°C target** is not about individual years but sustained averages.
- **Temporary exceedances** are increasingly expected—but repeated breaches will edge us closer to **irreversible tipping points**.

The **IPCC**'s estimated central warming for **2015–2034** is now **1.44°C**, with a 90% confidence range of **1.22–1.54°C**—alarming proximity to the Paris ceiling.

India's Climate Strategy: Adapting and Committing

As a major economy vulnerable to climate shocks, **India** has updated its **Nationally Determined Contributions (NDCs)** in alignment with global climate targets:

- **Reduce emissions intensity** of GDP by **45% by 2030** (from 2005 levels).
- **50% installed electric capacity** to be from **non-fossil sources** by 2030.
- Achieve **Net Zero by 2070**.
- Policy support includes:
  - **PM Solar Mission**, **Faster Adoption of Electric Vehicles (FAME)**.
  - **National Adaptation Fund for Climate Change (NAFCC)**.
  - **Mission LiFE** promoting sustainable lifestyle practices.

Implications for Policy and Planning

- Climate-induced **economic losses** (in agriculture, infrastructure, and healthcare) are expected to rise.
- **Food and water security** will be impacted by erratic weather and warming.
- Urban areas face growing stress from **heat islands**, water shortages, and energy demands.
- **Developing nations**, especially in the Global South, require **financial and technological support** to build climate resilience.

The WMO's latest report is a stark reminder: **the planet is rapidly approaching critical climate thresholds**, and short-term breaches are becoming the norm. To prevent long-term catastrophe, **accelerated mitigation, enhanced adaptation, and global cooperation** are more urgent than ever.

Q. Analyze the key findings of the WMO's 2025–2029 climate forecast and their implications for global and Indian climate policy. Compare the challenges of meeting the Paris Agreement's 1.5°C target with India's climate strategies, and suggest measures to strengthen global cooperation for sustainable development. ***[UPSC MAINS Practice Question]***

5.2. ARAVALLI GREEN PROJECT

Why in the News?

On **World Environment Day (June 5)**, Prime Minister Narendra Modi inaugurated the **Aravalli Green Wall Project**, a key initiative aimed at restoring degraded lands, combating climate change, and promoting ecological sustainability. This ambitious green initiative was India's central theme for this year's global environmental observance.

Restoring Nature: The Aravalli Green Wall Project

The **Aravalli Green Wall Project** is a large-scale afforestation and ecological restoration effort focused on reviving the fragile Aravalli range—a critical green buffer between the **Thar Desert and the Indo-Gangetic plains**. Originally launched in **2019** and showcased at the **UNCCD COP16 in Riyadh**, the project has now gained renewed momentum and visibility.

Project Scope and Objectives

Spanning **over 6 million hectares** across **29 districts** in **Haryana, Rajasthan, Gujarat, and Delhi**, the project aims to:

- Combat **land degradation and desertification**
- Establish **green corridors** through **tree plantation**
- Promote **water conservation** and the revival of natural water bodies
- Enhance **agroforestry and pasture lands** to support rural livelihoods

Implementation Strategy

The initiative focuses on **planting native species** on degraded lands—scrublands, wastelands, and deforested areas. It also involves:

- **Rejuvenation of ponds, lakes, and seasonal streams**
- **Setting up 1,000 nurseries**, funded by **CAMPA**, **MNREGA**, and **state-level initiatives**
- Integrating **climate-smart agricultural practices** to benefit local communities

Environmental and Socio-Economic Benefits

- **Carbon Sequestration**: Targets an **additional 2.5 billion tonnes** of carbon sink by **2030**, aligned with India's Paris Agreement commitments
- **Biodiversity Boost**: Revives flora and fauna across the Aravalli ecosystem
- **Cleaner Air and Water**: Reduces pollution and improves natural resource quality
- **Rural Empowerment**: Generates employment, strengthens livelihoods, and fosters community ownership

Collaborative Execution

The project's success hinges on a **multi-stakeholder model** involving:

- Central and state governments
- Forest and environmental departments
- Research institutions
- Civil society and local communities
- Private sector partnerships

Efficient **policy alignment**, **technical expertise**, and **public awareness** will be critical to its sustained impact.

The **Aravalli Green Wall Project** is more than a reforestation effort—it represents India's evolving commitment to environmental resilience, community empowerment, and sustainable development. On World Environment Day, it stands as a green promise for future generations.

Q. Discuss the significance of the Aravalli Green Wall Project in combating desertification and promoting ecological sustainability in India. How can such large-scale afforestation initiatives contribute to India's climate commitments and rural development? What challenges might impede the project's success? ***[UPSC MAINS Practice Question]***

5.3. DISTRICT & STATE LEVEL CELLS: FOREST RIGHTS ACT, 2006

Why in the News?

Recently, the Union Ministry of Tribal Affairs has approved the creation of 324 district-level and 17 state-level Forest Rights Act (FRA) cells under the Dharti Aba Janjatiya Gram Utkarsh Abhiyaan to fast-track the implementation of the Forest Rights Act, 2006, especially in areas with many pending claims.

The **Forest Rights Act (FRA), 2006:**

It recognizes the rights of Scheduled Tribes and Other Traditional Forest Dwellers (OTFDs) over forest land and resources. It affects around 150 million people across 1.7 lakh villages and 40 million hectares of forest. However, a significant backlog of claims delays rightful access for many beneficiaries.

To tackle this, the Ministry has established FRA Cells at district and state levels to:

- Assist claimants and Gram Sabhas with claim preparation and paperwork.
- Improve data management and administrative efficiency.
- Accelerate disposal of pending claims, even post-District Level Committee (DLC) approval.

These FRA Cells will function alongside existing statutory bodies such as Gram Sabhas, SDLCs, and DLCs, without interfering in their decisions. Presently, about 14.45% of over 51 lakh claims remain unresolved, with Assam and Telangana having the highest pendency.

This initiative aims to strengthen forest rights delivery but must ensure clear coordination to avoid duplication or conflict with existing statutory mechanisms.

Concerns and Challenges

While the creation of FRA Cells promises faster implementation, concerns have emerged:

- **Parallel Governance:** Since these cells are administrative creations outside the statutory FRA framework, they risk creating dual governance structures, potentially diluting accountability.
- **Lack of Legal Authority:** Unlike SDLCs and DLCs, FRA Cells do not have statutory powers, which may limit their effectiveness and legitimacy.
- **Bureaucratic Overlap:** The new cells might lead to duplication of efforts and blurred lines of responsibility among various administrative and statutory bodies.

The establishment of district and state-level FRA Cells represents a proactive step towards addressing the backlog in forest rights claims. However, ensuring clear roles, legal backing, and accountability is crucial to prevent administrative confusion and strengthen forest dwellers' access to justice.

Q. Which of the following is true about the Forest Rights Act, 2006?

[UPSC Pre. Practice Question]

(a) It grants ownership rights of forest land to all Indian citizens.

(b) It recognizes the rights of Scheduled Tribes and Other Traditional Forest Dwellers over forest land.

(c) It is implemented solely by the Ministry of Environment, Forest and Climate Change.

(d) It excludes any claims by Gram Sabhas in forest areas.

Ans. (b) It recognizes the rights of Scheduled Tribes and Other Traditional Forest Dwellers over forest land.

5.4. REVISED GREEN INDIA MISSION PLAN

Why in the News?

The **Ministry of Environment, Forest and Climate Change** has released the **revised Green India Mission (GIM) Document** for the **period 2021–2030**, with a renewed focus on restoring vulnerable ecosystems such as the Aravallis, Western Ghats, arid regions of the North west India, mangroves, and the Indian Himalayan Region.

Background of the News

Union Environment Minister Bhupender Yadav unveiled the revised GIM document on June 17, 2025, in Jodhpur, during an event commemorating the World Day to Combat Desertification and Drought.

About Green India Mission

- **Genesis:** The Green India Mission (GIM) was launched in February 2014 as one of the **eight missions** under **India's National Action Plan on Climate Change** (NAPCC).
- **Purpose**: The primary goal of the GIM is to combat climate change by increasing forest and tree cover, and the ecological restoration of degraded ecosystems and forests. **Original targets:**
  - Increase forest/tree cover on **5 million hectares** of forest and non-forest land.
  - Improve quality of forest cover on an additional 5 million hectares.
  - Strengthen forest-based livelihoods and ecosystem services.
- **Criteria for Implementation:** Activities under the **Green India Mission (GIM)** are prioritized in states based on:
  - **Ecological vulnerability mapping**
  - **Carbon sequestration potential** (photosynthesis-based CO_2 absorption by plants and trees)
  - **Extent of forest and land degradation**
  - **Overall restoration potential**
- **Afforestation Coverage (2015–2021):** Tree plantation and afforestation activities were undertaken across **11.22 million hectares** through various central and state schemes.
- **Funding Status (2019–2024):** The Centre allocated **₹624.71 crore** to 18 states for GIM related interventions, with **₹575.55 crore** already utilized.

Revised Green India Mission: Key Changes and Objectives

- **Revised GIM**: Updation based on feedback from **implementing partner states and scientific institutions** and to reflect **on-ground climate impacts**.
- **Central focus:** Restoration and saturation of ecologically vulnerable landscapes through regionally conducive best practices.
- **Micro-Ecosystem-Based Approach**: Introduces a micro-ecosystem-based approach with tailored, landscape-specific interventions.
- **Expanded Focus to Include New Critical Ecosystems:**
  - Aravallis (aligned with Aravalli Green Wall project)
  - Western Ghats
  - Indian Himalayan Region
  - Mangrove ecosystems
  - Arid zones of Northwest India
- **Strategic Restoration Interventions by Region**
  - **Aravalli Ranges:** Restoration aligned with the Aravalli Green Wall project**.**

Targeted Closure	**12 ecological gaps**, identified by the **Wildlife Institute of India**, that contribute to dust storms in Delhi-NCR and Punjab.
Restoration Planned	Across 8 lakh hectares in 29 districts and 4 states
Interventions	Native species plantations, restoration of forests, grasslands, water systems, and catchments
Estimated Cost	₹16,053 crore
Buffer zone	6.45 million hectares with a 5 km green belt.

- **Western Ghats**

Issues	Illegal mining, deforestation, ecosystem degradation
Actions	Afforestation, groundwater recharge and eco-restoration of abandoned mining areas.

- **Carbon Sink & Land Restoration Goals**

According to **ISRO's Desertification and Land Degradation Atlas**, 97.85 million hectares, or roughly one-third of India's land area, suffered from degradation in 2018–19.

Component	Key Figures and Goals
National Climate Commitment under the Nationally Determined Contribution	- Create carbon sink of **2.5–3 billion tonnes** CO_2 by 2030 via increased forest/tree cover.
Land Restoration	- Restore **26 million hectares** of degraded land by 2030 (UNFCCC target)
Natural Ecosystems Role (Forests, wetlands, grasslands, and mountains)	Act as natural carbon sinks and climate buffers by absorbing CO_2
Achievements (2005–2021)	**2.29 billion tonnes** of CO_2 equivalent sequestered
Open Forest Restoration Focus	- High-impact, cost-effective strategy
	- Forest Survey of India (FSI): **1.89 billion tonnes** CO_2 potential across 15 million hectares
Tree Cover Expansion Target	- 24.7 million hectares total
	- Estimated **3.39 billion tonnes** CO_2 sequestered by 2030

In essence, the revised GIM reinforces India's global climate commitments and provides a strategic framework to combat desertification, biodiversity loss, and forest degradation through inclusive and sustainable approaches.

Q. Which of the following statements regarding the Revised Green India Mission (2021–2030) are correct? (UPSC PRE PRACTICE MOCK)

(a) The mission aims to create an additional carbon sink of 5 billion tonnes of CO_2 equivalent by 2030.

(b) The Aravalli Green Wall project aims to restore degraded land across 29 districts in four states.

(c) Restoration of open forests is identified as a cost-effective strategy under the revised GIM.

(d) The Green India Mission is implemented only in states with a minimum of 30% forest cover.

Select the correct option(s) ***[UPSC Pre. Practice Question]***

(a) B and C only (b) A and D only

(c) B, C and D only (d) A, B and C only

Ans. (a) B and C only

Q. Discuss the strategic shift introduced in the Revised Green India Mission (2021–2030). How does it align with India's climate commitments and ecological restoration goals?

[UPSC MAINS Practice Question]

5.5. 50 YEARS OF CROCODILE CONSERVATION PROJECT IN INDIA IN 2025

Why in the News?

As India marked **50 years of its Crocodile Conservation Programme** in 2025, the Odisha Government commemorated ***World Crocodile Day*** on June 17 as a significant milestone in its long-standing conservation journey**.**

Key Highlights of Crocodile Conservation Project

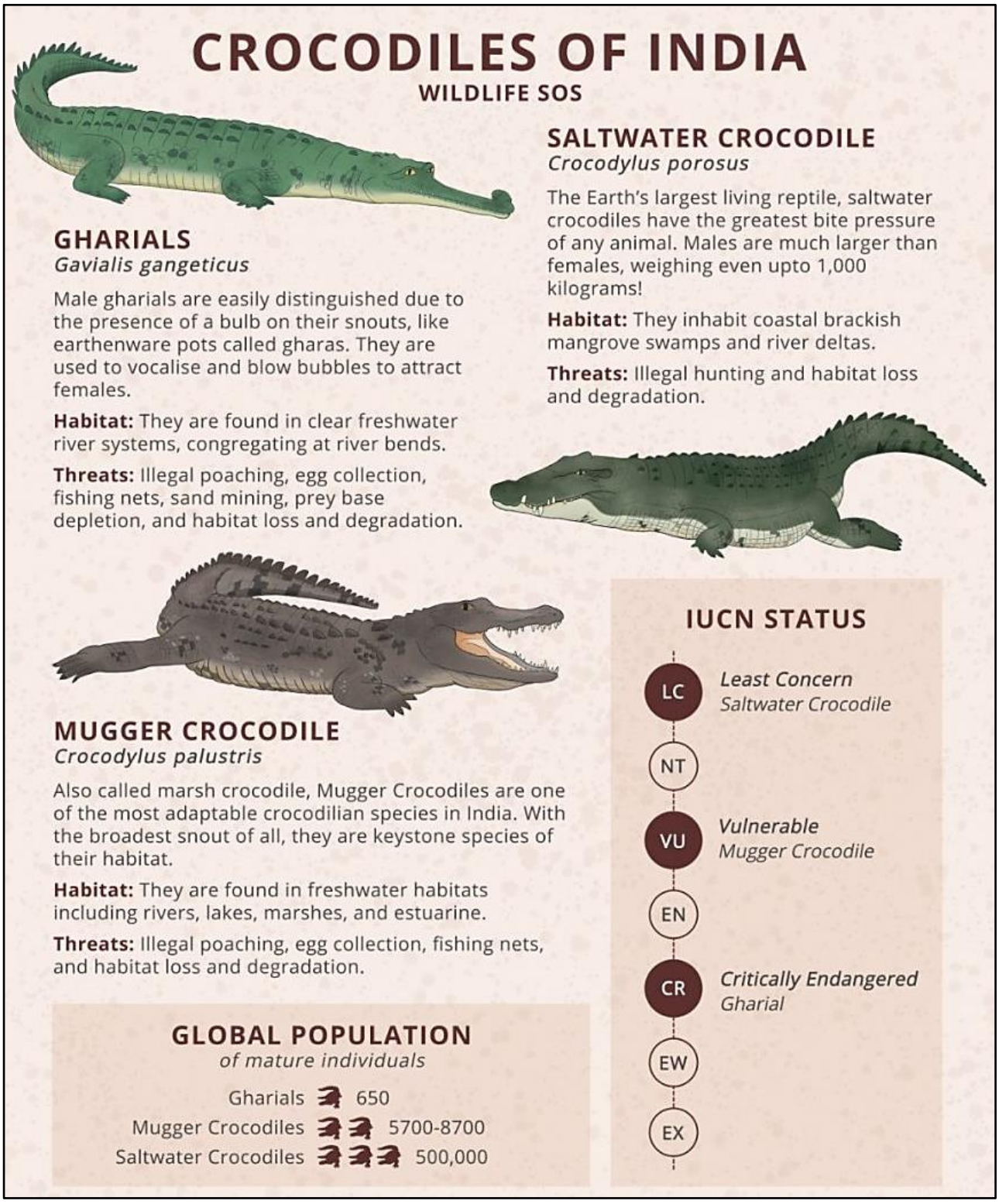
Launch Date	1st April, 1975
Initiated by	Government of India based on recommendations by Dr. H.R. Bustard
Supported by	UNDP and FAO (technical and financial assistance).
Objective	**-** Restore and protect natural habitats of crocodiles. - Rebuild crocodile populations through captive breeding and reintroduction

Conservation Milestones and Achievements

- **Odisha's Unique Role:** Only Indian state with conservation centres for all three native crocodile species:
  - **Tikarpada (Satkosia) –** Gharials
  - **Dangamal (Bhitarkanika) –** Saltwater crocodiles
  - **Ramatirtha (Similipal) –** Mugger crocodiles

Species-Wise Progress:

Species	Status	Recovery Highlights
Saltwater Crocodile	**IUCN:** Least Concern **WPA:** Schedule I **CITES:** Appendix I	- Population: ~2,500 (mainly in Bhitarkanika, Odisha). - Also in Andaman & Nicobar Islands and Sundarbans
Mugger Crocodile	**IUCN:** Vulnerable **WPA:** Schedule I **CITES:** Appendix I	- Recovered to 8,000–10,000 individuals. - Reclaimed historical range in Ganga Basin
Gharial	**IUCN:** Critically Endangered **WPA:** Schedule I **CITES:** Appendix I	- 400+ nests annually. - Found in Chambal Sanctuary (MP/UP/Rajasthan), Katarnia Ghat, Gandak River, Corbett, and Son Gharial Sanctuary. - India holds **80% of the world's wild gharials.**



Ongoing & Future Conservation Efforts

- **New Gharial Conservation Project (2025):** Aims to reintroduce and expand gharial populations across Ganga, Brahmaputra, Indus, and Mahanadi river systems**.**
- **Madras Crocodile Bank:** Continues to play a key role in breeding, reintroduction, and public awareness.

Ecological Significance of Crocodiles

- **Keystone species:** Maintain aquatic ecosystem balance.

- **Indicator of wetland health:** Presence signifies a thriving water ecosystem.

Constitutional Provisions for Wildlife Protection

- **Article 51A(g)** – *Fundamental Duty*: It shall be the duty of every citizen of India to **protect and improve the natural environment**, including **forests and wildlife**.
- **Article 48A** – *Directive Principles of State Policy (DPSP)*: The State shall endeavour to **protect and improve the environment** and to **safeguard forests and wildlife**.

Global and Indian Crocodile Diversity: Key Facts

- There are 13 crocodile species globally, including the Nile and saltwater crocodiles.
- India hosts 3 native species: gharial, mugger, and saltwater crocodile.
- The **saltwater crocodile** is the world's largest living reptile.
- Crocodiles are **nocturnal** and **poikilothermic**, meaning they rely on external sources to regulate body temperature.

With Odisha at the forefront and sustained policy, habitat, and breeding efforts, India has emerged as a leader in crocodilian conservation.

Q. Consider the following statements regarding the Crocodile Conservation Project in India:

1. It was launched in 1975 with support from the United Nations Environment Programme (UNEP).
2. Odisha is the only Indian state with conservation centres for all three native crocodile species.
3. The Gharial is classified as "Vulnerable" under the IUCN Red List.
4. India hosts over 80% of the world's wild gharial population.

Which of the statements given above are correct? ***[UPSC Pre. Practice Question]***

(a) 1 and 2 only (b) 2 and 4 only

(c) 2, 3 and 4 only (d) 1, 2 and 4 only

Ans. (b) 2 and 4 only

5.6. GLOBAL DROUGHT OUTLOOK REPORT, 2025

Why in the News?

The **Organization for Economic Co-operation and Development (OECD)** has released the Global Drought Outlook Report 2025, evaluating rising drought-related challenges worldwide and providing strategic policy suggestions for climate-resilient drought management.

About the Global Drought Outlook Report

- **Strengthening Drought Preparedness**: Assesses how countries can strengthen drought preparedness and management to cope with climate change.
- **Policy Recommendations for Adaptation**: Offers policy tools to reduce losses, build resilience, and adapt to drier futures.
- **Data-Driven Insights:** Provides updated data on the human, ecological, and economic impacts of drought globally.

Key Findings of the Report

- **Global Trends: 40%** of the world's land area now faces **frequent and severe droughts**.
  - **Since 1980**: **37%** of global land has suffered from **soil moisture decline**.
    - Groundwater levels are falling in **62% of monitored aquifers**.
    - Major rivers and aquifers globally are experiencing declining water levels.

- **Economic Impact: 3%–7.5%** annual increase in the cost of a typical drought episode.
  - **Projected 35% increase** in drought-related economic losses by **2035**.
  - **Crop yields** may fall by up to **22%** in drought-prone areas.
  - **Sectors affected**: **Hydropower** (e.g., India, Australia facing operational disruption)
    - **Inland water transport** (e.g., Panama Canal drought)
- **Humanitarian and Environmental Impact:** Though **droughts account for only 6%** of natural disasters, they cause **34% of all disaster-related deaths** (WMO, 2021).
  - Worsens **poverty**, **inequality**, **food insecurity**, **displacement**, and **conflict**, especially in regions like Sub-Saharan Africa.

Understanding Droughts

Droughts are periods marked by a significant **imbalance in hydrological conditions**, typically due to **drier-than-normal weather**. These events are primarily triggered by **low rainfall** and can be worsened by **high temperatures**, **strong winds** (which increase evaporation), and **unsustainable human activities**.

Types of Drought

- **Meteorological Drought:** A prolonged spell of **below-average precipitation**.
- **Agricultural/Ecological Drought:** Occurs when **soil moisture becomes insufficient** for crops and vegetation.
- **Hydrological Drought**: Defined by a **long-term decline in surface or groundwater** levels (e.g., rivers, reservoirs).

Global and National Responses

- **International Initiatives:**
  - UNCCD Drought Initiative
  - International Drought Management Programme *(Led by **World Meteorological Organization & Global Water Partnership**)*
- **India's Initiatives:**
  - **NADAMS** – National Agricultural Drought Assessment and Monitoring System
  - **Watershed Development Component (WDC-PMKSY)**
  - **Atal Bhujal Yojana** – Groundwater management and recharge

Overall, this report aims to inform policymakers and stakeholders about the escalating risks of drought in a warming world and the solutions available to address this challenge. By providing scientific and policy insights, lessons learned, and novel data, it aims to support evidence-based decision-making to protect communities, economies, and ecosystems and ensure a more sustainable and climate-resilient future.

Q. With reference to the Global Drought Outlook Report 2025, consider the following statements:

1. The report was released by the United Nations Framework Convention on Climate Change (UNFCCC).
2. The report finds that 40% of the world's land area now faces frequent and severe droughts.
3. It highlights that droughts, despite being only 6% of natural disasters, account for over one-third of disaster-related deaths.

Which of the statements given above is/are correct? ***[UPSC Pre. Practice Question]***

(a) 1 and 2 only (b) 2 and 3 only

(c) 1 and 3 only (d) 1, 2 and 3

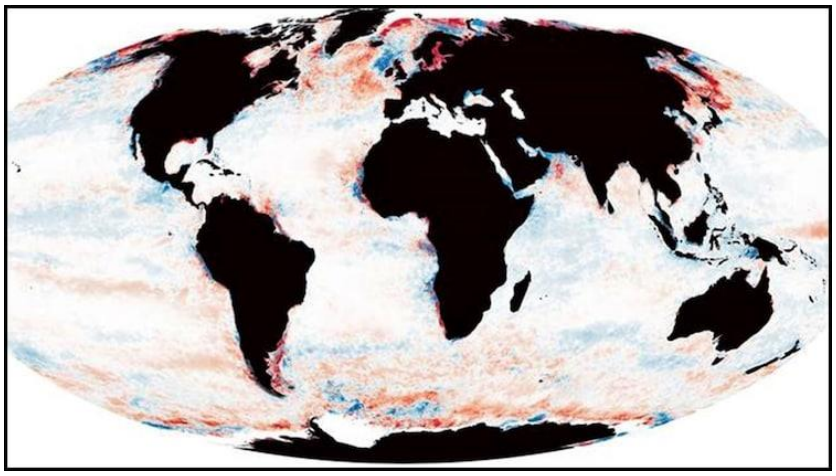
Ans. (b) 2 and 3 only

5.7. GLOBAL OCEANS ARE DARKENING, DISRUPTING LIFE BENEATH THE SURFACE

Why in the News?

A recent study titled ***"Darkening of the Global Ocean"*** by researchers from the University of Plymouth reveals that **21% of the world's oceans (more than one-fifth)** have darkened over the past two decades, endangering marine ecosystems that depend on sunlight for survival**.**

Background of the News



- The researchers from the University of Plymouth warn that this ocean darkening trend represents a new ecological crisis, with serious consequences for marine biodiversity and the health of the planet as a whole.
- Climate change is not only degrading terrestrial ecosystems but is also severely impacting marine environments.

What is Ocean Darkening?

- Ocean darkening refers to the **reduction in light penetration** into the oceans, leading to the **shrinking of the photic zone**—the sunlit layer (up to ~200m deep) where **~90% of marine life** exists.
- This zone supports vital biological processes such as **photosynthesis, communication, feeding, and reproduction**, and plays a critical role in **regulating climate** and sustaining **global fisheries.**

Key Findings of the Study

- **Extent of Change**: 21% of global oceans experienced darkening in the past two decades.
- **Severe Decline**: 9% of ocean area saw a reduction in photic depth >50m; 2.6% saw reductions >100m.
- **Geographical Impact**:
  - **Most affected**: Arctic, Antarctic, and Gulf Stream regions.
  - **Other impacted areas**: Coastal zones like the Baltic Sea (due to erosion and nutrient loading).
- **Mixed Trends**:
  - Areas such as the **North Sea**, **eastern UK coastline**, and the **Arctic** experienced **greater light loss** than other parts of the ocean.
  - Some regions like parts of the English Channel became lighter, showing varied patterns due to differing rainfall, land use, and currents.

Causes Behind Ocean Darkening

- **Coastal Areas**:
  - Agricultural runoff, **organic matter**, and **sediment flow** due to increased rainfall.
  - These lead to **algal blooms**, blocking sunlight.

- **Open Oceans**:
  - **Surface warming**, plankton dynamics changes, and altered **ocean circulation** disrupt light penetration.

Ecological and Climate Impacts

- **Marine Productivity**: Decreased light affects photosynthesis, reducing oceanic productivity.
- **Biodiversity Threats**: Species that rely on light for survival (e.g., **Calanus copepods**) face habitat compression and predation risks.
- **Fisheries Disruption**: Altered reproductive cycles and declining fish stocks.
- **Climate Regulation**: Diminished capacity for **carbon absorption** and **oxygen production**, affecting climate resilience.

Scientific and Conservation Concerns

- **Species Displacement**: Animals dependent on sun/moonlight cues will be pushed to shallower waters, leading to overcrowding and competition.
- **Potential Habitat Crisis**: Referred to as one of the largest recent **global habitat loss events**.
- **Indicator Species**: Calanus copepods used in the study are highly light-sensitive and central to marine food chain.

Q. Ocean darkening has emerged as a critical but lesser-known consequence of climate change. Examine its causes and potential impact on global fisheries and food security.

[UPSC MAINS Practice Question]

Q. Which of the following ecological impacts are associated with ocean darkening?

1. Compression of marine habitats
2. Disruption of carbon absorption
3. Enhanced oxygen production
4. Threat to light-sensitive marine species

Which of the statements given above is/are correct? ***[UPSC Pre. Practice Question]***

(a) 1 and 3 only (b) 2 and 4 only

(c) 1, 2 and 4 only (d) 1, 2, 3 and 4

Ans. (c) 1, 2 and 4 only

5.8. FIRST ASSEMBLY OF THE INTERNATIONAL BIG CAT ALLIANCE (IBCA)

Why in the News?

The inaugural session of the International Big Cat Alliance (IBCA) Assembly was convened in New Delhi on Monday, June 16, and was chaired by Union Environment Minister Bhupender Yadav.

Background of the News

- At the first Assembly of the International Big Cat Alliance (IBCA), held in New Delhi on June 16, 2025, **Union Environment Minister Bhupender Yadav** was unanimously endorsed as the **President of the IBCA** by **all nine participating countries** — Bhutan, Cambodia, Eswatini, Guinea, India, Liberia, Suriname, Somalia, and Kazakhstan.

About International Big Cat Alliance (IBCA)

- **Establishment:** Launched in March 2024 by the Government of India through the National Tiger Conservation Authority under the Ministry of Environment, Forest and Climate Change.
- **Mandate: Conservation of seven big cats:** Tiger, Lion, Leopard, Snow Leopard, Cheetah, Jaguar, Puma.
- **Purpose:**
  - Facilitate global collaboration and synergy among stakeholders.
  - Share and replicate successful conservation practices in range countries.
- **Funding:**
  - The Union Government has allocated ₹150 crore for IBCA activities from 2023–24 to 2027–28.
- **Membership and Global Reach**
  - **Founding Members (16):** Armenia, Bangladesh, Bhutan, Cambodia, Egypt, Ethiopia, Ecuador, India, Kenya, Malaysia, Mongolia, Nepal, Nigeria, Peru, Suriname, Uganda.
  - **Range Countries:** 95 countries fall within the natural distribution ranges of big cats, including Canada, China, Congo, Ghana, Brazil, Iran, Nepal, Pakistan, Russia, United States, etc.
  - **Confirmed Members (as of Sept 2024):**
    - 25 countries, including Bangladesh, Nigeria, Egypt, Suriname, Ecuador, Peru, Kenya, and Rwanda.
  - **Open Membership:**
    - All UN member countries can join IBCA by signing the framework agreement and conveying consent via Note Verbale (formal diplomatic note).

Rationale Behind IBCA

- **Announcement:**
  - Made by PM Narendra Modi in 2023 at Mysuru, commemorating **50 years of Project Tiger.**
- **Historical Context:**
  - India's tiger population declined from ~40,000 at Independence to ~1,800 by 1970, mainly due to hunting and poaching.
  - Project Tiger (1973) was launched to reverse this decline.
- **Ecological Importance of Big Cats:**
  - Apex predators regulate prey populations.
  - Maintain ecosystem balance and reduce risks like overgrazing, wildfires, and zoonotic diseases.
  - Protecting big cats supports biodiversity, climate adaptation, and carbon sequestration.

Project Tiger: A Precursor to IBCA

- **Initial Reserves (1973):**
  - **9 reserves** in Assam, Bihar, Karnataka, MP, Maharashtra, Odisha, Rajasthan, UP,
  - and West Bengal.
  - **Famous ones:** Kanha (MP), Jim Corbett (Uttarakhand), Bandipur (Karnataka).
- **Current Status:**
  - India hosts over 3,600 tigers, accounting for 70% of the global tiger population.
  - Ongoing issues: Deforestation, human-wildlife conflict, and evolving poaching methods.
    - E.g., leaner poaching syndicates collaborating with narcotics and arms traffickers.

Institutional Development

- **Headquarters Agreement:**
  - Signed during the June 2025 assembly, enabling IBCA to establish its headquarters and offices in India.
- **Leadership Emphasis:**
  - Minister Bhupender Yadav called for collective global action to advance conservation efforts and combat growing threats to big cats.

Significance of Big Cat Conservation

- **Ecosystem Balance:** Big cats are keystone species—they regulate prey populations, maintaining ecological balance.
- **Climate Mitigation:** Preserving big cat habitats protects forests, carbon sinks, and watersheds.
- **Livelihoods & Ecotourism:** Conservation efforts support local communities through tourism and jobs.
- **Disaster & Disease Mitigation**: Healthy ecosystems mitigate wildfires, soil erosion, and pandemic risks.

Conservation Status of Big Cats

Species	Scientific Name	IUCN Status	CITES Status	Wildlife Protection Act (India)
Tiger 	*Panthera tigris*	Endangered	Appendix I	Schedule I
Lion 	*Panthera leo*	Vulnerable	Appendix I	Schedule I
Leopard 	*Panthera pardus*	Vulnerable	Appendix I	Schedule I
Snow Leopard 	*Panthera uncia*	Vulnerable	Appendix I	Schedule I

Cheetah 	*Acinonyx jubatus*	Vulnerable	Appendix I	Schedule I
Jaguar 	*Panthera onca*	Near Threatened	Appendix I	Not Found in India
Puma 	*Puma concolor*	Least Concern	Appendix I	Not Found in India

Q. With reference to Project Tiger, which of the following statements is/are correct?

1. It was launched in 1973 with 9 tiger reserves.
2. It was the first national wildlife conservation programme initiated post-independence.
3. It has helped India retain over 70% of the world's wild tiger population.

Select the correct answer using the code below: ***[UPSC Pre. Practice Question]***

(a) 1 and 3 only (b) 2 and 3 only

(c) 1 and 2 only (d) 1, 2 and 3

Ans. (a) 1 and 3 only

Q. Despite being apex predators, many big cat species face extinction threats globally. Explain how ecological roles, international frameworks, and national policies can converge to ensure long-term survival of these species. ***[UPSC MAINS Practice Question]***

5.9. GHUMOT, THE KEEPER OF CULTURAL PAST

Why in the News?

In 2019, the Goa State Cabinet officially recognized the **Ghumot** as the state's **heritage musical instrument**. However, this recognition came with a significant change—**the traditional use of monitor lizard skin was banned**, prompting debates over its acoustic authenticity and cultural aesthetics.

About Ghumot

The **Ghumot** (also spelled *Ghumat*) is a **traditional percussion instrument** integral to the folk and ritualistic music of Goa. It is classified as a **membranophone**, producing sound through the vibration of a stretched membrane.

Construction and Design

- The body of the Ghumot is crafted from **baked earthen clay**.
- One end remains **open**, while the other is **covered with animal hide**.

- Historically, the membrane was made from the **skin of the Indian monitor lizard**; however, due to wildlife protection concerns, **goat skin** is now predominantly used.
- Before performance, the membrane is gently **warmed over a fire** to increase tension, enhancing tonal sharpness and resonance.
- The player **strikes the membrane** rhythmically to produce crisp, percussive beats.

Cultural and Religious Significance

The Ghumot occupies an **important place in both Hindu and Christian communities** of Goa, cutting across religious lines:

Community	Ceremonial Use
Hindus	Played during **Ganesh Chaturthi**, especially for *Ganapati Arati*, *Stotra*, and *Visarjana* rituals
Christians	Features in the traditional **pre-wedding 'roce' ceremony**, enhancing community celebrations
Common Practices	Commonly heard during **Shigmo** (Holi) festivals and the **Zagor** harvest rituals organized by local village bodies (*mandd*)

Originally, this folk instrument was **crafted and played by Goa's tribal communities**, who preserved its form and function across generations.

The Ghumot stands as a vibrant symbol of **Goa's multicultural folk traditions**, uniting diverse religious groups through rhythmic expression. Its **recognition as a heritage instrument**, minus the use of endangered animal products, reflects India's evolving stance on **cultural preservation** intertwined with **wildlife protection**.

Q. With reference to the traditional Goan musical instrument Ghumot, consider the following statements:

1. The Ghumot is a membranophone made with an earthen clay body and animal skin membrane.
2. Its use was historically associated only with Hindu religious festivals in Goa.
3. The use of monitor lizard skin in its construction has been banned due to wildlife conservation concerns.
4. The Ghumot has been officially declared Goa's state heritage musical instrument.

Which of the statements given above are correct? ***[UPSC Pre. Practice Question]***

(a) 1, 3, and 4 only (b) 1 and 2 only

(c) 2 and 4 only (d) 1, 2, 3, and 4

Ans. (a) 1, 3, and 4 only

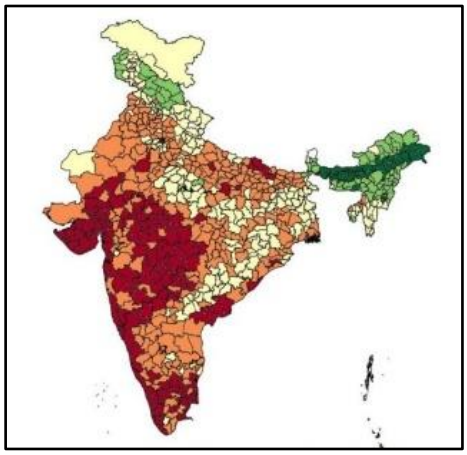
5.10. INDIA'S ESCALATING HEAT VULNERABILITY: OVER HALF OF DISTRICTS AT SEVERE RISK

Why in the News?

According to the new study ***"How Extreme Heat is Impacting India: Assessing District-level Heat Risk"***, residents of Delhi, Maharashtra, Goa, Kerala, Gujarat, Rajasthan, Tamil Nadu, Andhra Pradesh, Madhya Pradesh, and Uttar Pradesh are among those facing the highest levels of heat-related risk across the country.

Background of the News

- A recent study by the ***Council on Energy, Environment and Water (CEEW)*****,** titled 'How Extreme Heat is Impacting India', reveals that 57% of India's districts, accounting for 76% of the population, are at high or very high risk from extreme heat events.
  - CEEW, a prominent climate think tank based in New Delhi, conducted the analysis by creating a Heat Risk Index (HRI).
- The HRI assessed **734 districts using 35 indicators**, such as:
  - Rise in the frequency of extremely hot days
  - Population density
  - Share of persons with disabilities
  - Changes in land use and land cover patterns



Heat Risk Explained: Beyond Heatwaves and Stress

- **Heatwaves vs. Heat Stress**
  - **Heatwaves** refer to prolonged spells of abnormally high temperatures in a region but lack a standard global definition.
  - **Heat stress** occurs when the human or animal body temperature exceeds 37°C, impairing the ability to cool down. This can lead to cramps, exhaustion, and even **heatstroke** if temperatures **surpass 40°C.**
- **What is Heat Risk?**
  - **Heat risk** is the likelihood of heat-related illness or death due to exposure to extreme temperatures.
  - It is a broader and more complex concept than just heatwaves, encompassing various environmental and social factors.
  - **Key Determinants of Heat Risk:** According to the CEEW study, heat risk is shaped by three critical components:
    - **Heat intensity** – including **temperature levels and humidity**.
    - **Exposure** – the **extent and duration** of contact with high heat.
    - **Vulnerability** – underlying conditions such as **population density, disability levels, housing quality**, and socio-economic status.

Understanding Drivers of Rising Heat Risk in India

- **Increase in Very Warm Nights**
  - Between 2012 and 2022, over **70% of Indian districts** experienced five or more additional very warm nights per summer (March–June).
  - Elevated night temperatures hinder the body's ability to cool down after daytime heat, increasing the risks of heatstroke and aggravating non-communicable diseases (e.g., **diabetes and hypertension**).
- **Rising Relative Humidity in North India**
  - Relative humidity in North India, especially the Indo-Gangetic Plain, has increased from 30–40% (1982–2011) to 40–50% (2012–2022).
  - Higher humidity makes it harder for the body to cool down through sweating once body temperature exceeds 37°C.

- This heightens the risk of heat stress and heat-related illnesses, especially in peak summer months.

- **High Population Density and Urbanisation**
  - High-density urban areas like Mumbai and Delhi face greater exposure due to a high concentration of people.
  - Rapid urbanisation in Tier II and III cities (e.g., Pune, Thoothukudi, Gurugram) is linked with hotter nights.
  - This is attributed to concrete infrastructure absorbing heat during the day and releasing it at night, intensifying urban heat island effects.
- **Regional Vulnerabilities**
  - States including Andhra Pradesh, Maharashtra, Haryana, Punjab, Chhattisgarh, Bihar, and Uttar Pradesh face elevated risk due to:
- High temperatures
- Socio-economic vulnerabilities (e.g., elderly population)
  - Health challenges like the high prevalence of non-communicable diseases (NCDs).

Key Highlights of the Study

- **Record-Breaking Heat in 2024**
  - 2024 was the warmest year on record globally, including India.
  - Global temperature rose over 1.5°C above pre-industrial levels (1850–1900).
  - India's temperature in 2024 was about 1.2°C higher than the 1901–1910 average.
- **Rising Health Impact of Heatwaves**
  - India experienced its longest recorded heatwave since 2010 during 2024.
  - The country recorded over 44,000 heatstroke cases in the same year.
  - This signals a rising public health emergency linked to climate change.
- **Gaps in Heat Action Plans (HAPs)**
  - India's Heat Action Plans—preparedness frameworks for extreme heat—remain inadequate.
  - A study by Sustainable Futures Collaborative (SFC) found that:
- Many HAPs lack long-term strategies to address worsening heat risk.
- Cities that do have long-term strategies have failed in effective implementation.
- **Implications for the Future**
  - Inadequate planning and implementation of HAPs could lead to:
  - Increased heat-related mortality
  - Greater vulnerability to more frequent, intense, and prolonged heatwaves in coming years.

Q. How does rapid urbanization contribute to India's increasing exposure to heat stress? Suggest mitigation measures. ***[UPSC MAINS Practice Question]***

5.11. NEWS IN SHORTS

5.11.1. INDIA'S FIRST E-WASTE RECYCLING PARK

Why in the News?

The Delhi government has announced the development of India's first electronic waste (e-waste) eco park in Holambi Kalan, North Delhi.

E-Waste Recycling Initiatives in India

- **E-Waste Management Rules, 2022** – Enforces **Extended Producer Responsibility (EPR)** for safe disposal and recycling.
- **CPCB EPR Portal** – Tracks producer compliance and e-waste movement digitally.
- **Authorised Recyclers** – 500+ certified recyclers recover valuable materials responsibly.
- **Awareness Drives** – Campaigns like **Swachh Digital Bharat** promote responsible disposal.
- **State Initiatives** – Delhi's **E-Waste Eco Park**, Maharashtra and Karnataka's collection networks lead the way.
- **Informal Sector Inclusion** – Training programs integrate informal workers into formal recycling.
- **Circular Economy Push** – Linked with **PLI scheme** to reduce e-waste and boost sustainable manufacturing.

Benefits of Park

- **Waste Management Leadership**: Positions Delhi as a pioneer in scientific e-waste recycling.
- **Environmental Gains**: Reduces toxic landfill burden and promotes resource recovery.
- **Economic Boost**: Generates revenue and creates green jobs in the formal recycling sector.
- **Circular Economy**: Promotes reuse, recovery, and sustainability in urban development.
- **Worker Welfare**: Aims to integrate and uplift informal waste workers into the formal sector.

The e-waste eco park is a landmark initiative in India's journey toward sustainable urban infrastructure and environmental responsibility. By blending global expertise with local implementation, Delhi is setting a model for **resource efficiency, inclusive green growth, and circular economy transformation**.

Q. Discuss the strategic significance of the E-Waste Eco Park announced in Delhi in the context of India's transition towards a circular economy. In your answer, examine its potential environmental, economic, and social benefits, as well as the role of regulatory and PPP frameworks in ensuring sustainable e-waste management. ***[UPSC MAINS Practice Question]***

5.11.2. TWO NEW RAMSAR SITES IN RAJASTHAN

Why in the News?

Recently, the wetlands of Khichan (Phalodi) and Menar (Udaipur) in Rajasthan have been designated as Ramsar Sites, increasing India's total to 91—the highest number in Asia. This recognition underscores India's commitment to wetland conservation and sustainable management.

Khichan and Menar: New Ramsar Sites

- **Khichan:** Renowned for its massive gatherings of migratory Demoiselle cranes, attracting thousands of these birds each winter.
- **Menar (Bird Village):** Celebrated for successful community-driven bird conservation efforts, exemplifying local stewardship in ecological protection.

With these additions, Rajasthan now hosts four Ramsar Sites, including Sambhar Lake and the famous Keoladeo Ghana National Park.

Understanding Wetlands

Wetlands are ecosystems where water saturates the land, either permanently or seasonally. These include marshes, peatlands, fens, and shallow marine areas (up to six meters deep). Serving as transitional zones between terrestrial and aquatic environments, wetlands are vital for biodiversity, water purification, flood control, and climate regulation.

Ramsar Convention and India's Role

The Ramsar Convention, established in 1971 in Ramsar, Iran, is an international treaty aimed at conserving wetlands and promoting their sustainable use. India became a signatory in 1982 and has since made significant strides in wetland protection.

Montreux Record: Wetlands Under Threat

The Montreux Record is a list within the Ramsar framework that identifies wetlands facing ecological degradation from human activities or pollution. India has two wetlands on this list:

- **Keoladeo National Park, Rajasthan (since 1990):** Also a UNESCO World Heritage Site.
- **Loktak Lake, Manipur (since 1993):** Known for its unique Phumdis—floating vegetation mats crucial for local ecology.

Chilika Lake was listed in 1993 but successfully restored and removed from the Montreux Record in 2002, becoming the first Asian wetland to achieve this.

The inclusion of Khichan and Menar as Ramsar Sites highlights India's growing leadership in wetland conservation, balancing ecological preservation with community involvement. Protecting these habitats is essential for sustaining biodiversity, supporting migratory species, and maintaining ecological health.

Q. Consider the following statements:

1. Ramsar Sites are wetlands recognized under an international treaty for conservation.
2. India joined the Ramsar Convention in 1982.
3. Chilika Lake is currently listed in the Montreux Record.

Which of the above statements is/are correct? ***[UPSC Pre. Practice Question]***

(a) 1 and 2 only (b) 2 and 3 only

(c) 1 and 3 only (d) All of the above

Ans. (a) 1 and 2 only

5.11.3. ENVISTATS INDIA 2025

Why in the News?

MoSPI has released the 8th edition of *EnviStats India 2025*, a detailed report assessing India's environmental status to support data-driven policymaking.

About EnviStats India 2025:

Prepared annually by the National Statistics Office since 2018, the report follows the UN's FDES 2013 framework for standardized, comparable environmental data. The latest edition expands its scope, restructures data presentation, and adds new indicators on access to electricity, transport, and sanitation.

Key Findings and Highlights

- **Rising Temperatures:** India's annual mean temperature has increased from 25.05°C in 2001 to 25.74°C in 2024. Both minimum and maximum temperatures have also shown steady upward trends, signaling ongoing climate warming.
- **Rainfall Patterns:** Rainfall data from 2001 to 2024 exhibits significant annual variability due to monsoon fluctuations, but no definitive long-term trend in overall precipitation has been observed.
- **Biodiversity:** Of the world's 247,605 marine faunal species, India accounts for 20,613, highlighting its rich marine biodiversity.
- **Fish Production:** Inland fish production nearly doubled in a decade, rising from 61.36 lakh tonnes (2013-14) to 139.07 lakh tonnes (2023-24), reflecting growth in aquaculture and freshwater fisheries.
- **Environmental Expenditure:** The Environment Sustainability sector saw the highest expenditure in 2021-22 at Rs. 2433.24 crore, followed by rising investments in Conservation of Natural Resources. The Agro-Forestry sector had the lowest expenditure among these major environmental sectors.

Significance of EnviStats India 2025

This publication is a vital tool for monitoring India's environmental progress, aligning national data with international standards, and aiding policy formulation for sustainable development. The data trends underscore the pressing need to address climate change impacts, conserve biodiversity, and boost sustainable resource management to meet India's environmental goals.

Q. "Discuss the significance of the EnviStats India report in supporting India's environmental policy framework. How can statistical data help address emerging environmental challenges?"

[UPSC MAINS Practice Question]

5.11.4. JUMPING SPIDER

Why in the News?

A newly identified jumping spider species named *Spartaeus karigiri* has been discovered in Karnataka, marking the first documented occurrence of the *Spartaeus* and *Sonoita* genera in India—genera that were previously only known from parts of Southeast Asia and Africa.

Spartaeus karigiri: A New Discovery in Indian Biodiversity

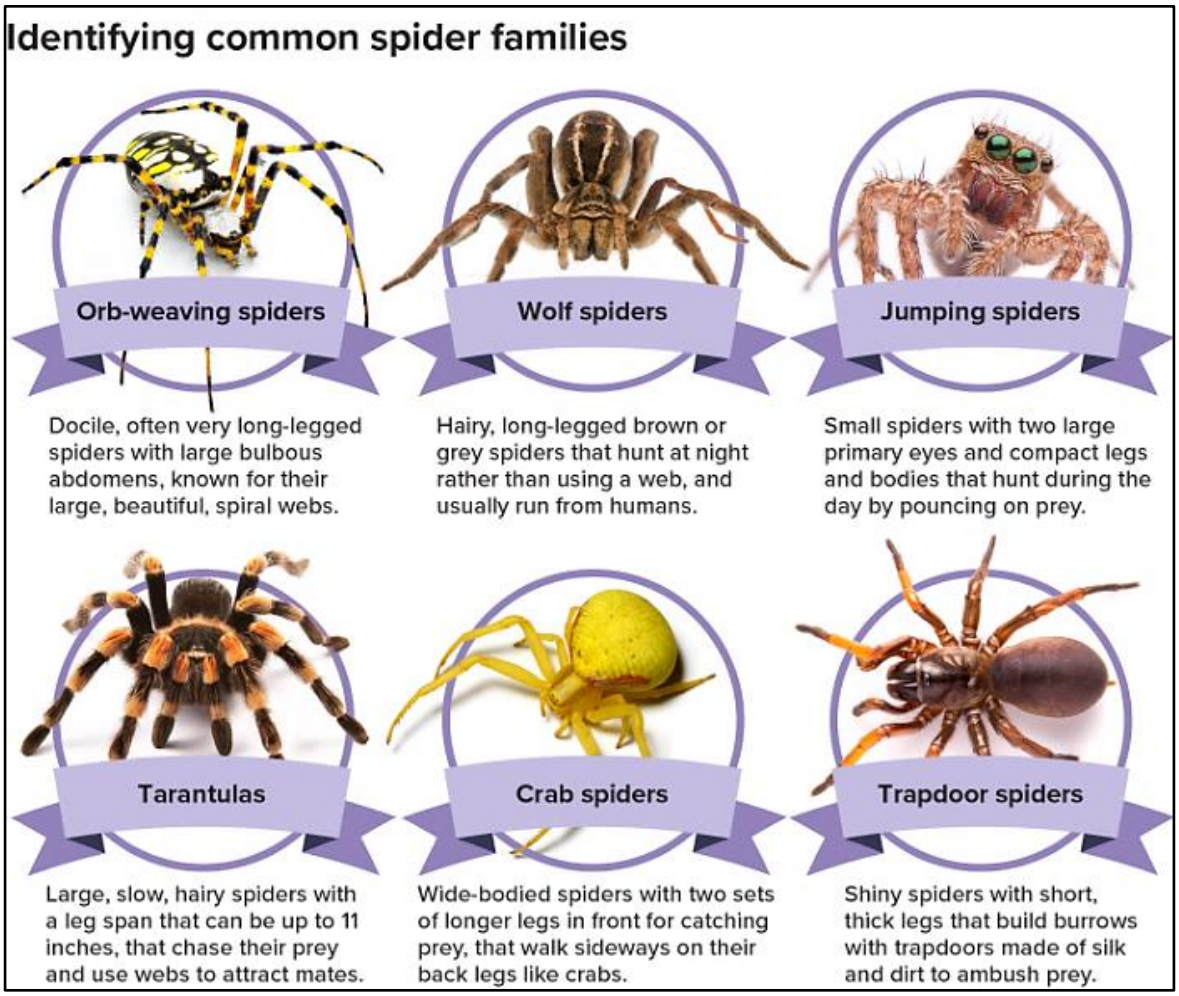
Overview of the Discovery

The species *Spartaeus karigiri* has been named after **Karigiri (Elephant Hill)** in Karnataka, where it was first found. This discovery has also led to the identification of *Sonoita cf. lightfooti* in the same region—previously thought to be native only to Africa—indicating either an extension of its natural range or a case of species introduction.

Jumping Spiders: A Global Family

Jumping spiders belong to the **Salticidae family**, the largest among all spider families, comprising over **5,000 species**. They fall under the **Spartaeinae subfamily** of the **Order Araneae** and **Class Arachnida**.

- **Habitat Range**: These spiders are widespread across all continents except Antarctica, thriving particularly well in tropical climates.



- **Physical Features**: Generally small (less than 0.5 inches), they are covered in fine hairs and possess **eight eyes**, with two prominent front-facing ones that provide excellent vision—crucial for tracking prey, navigating environments, and mating rituals.
- **Locomotion**: They excel in jumping and climbing and use a silk thread as a safety line during leaps.

Unique Hunting and Survival Traits

- **Feeding Habits**: Jumping spiders are **active hunters**, often feeding on small insects. They employ tactics such as stalking, blending in with surroundings, or even **mimicking ants** to catch prey. Some species have also been observed feeding on **nectar and pollen** opportunistically.
- **Jumping Ability**: Their leaps can exceed **50 times their body length**, achieved through a **hydraulic mechanism** that increases leg pressure, rather than muscular force.

Reproduction and Lifecycle

- Female jumping spiders are protective of their offspring, guarding **egg sacs spun from silk** until the young spiderlings hatch and molt through several stages to reach maturity.

Q. With reference to jumping spiders, consider the following statements:

1. They belong to the family Salticidae, which is the largest spider family globally.
2. Spartaeus karigiri, a newly discovered species in India, was named after a hill located in Tamil Nadu.
3. Some jumping spiders are known to feed on plant material such as nectar and pollen.
4. Their jumping ability is powered by a hydraulic mechanism rather than muscle contractions.

Which of the statements given above are correct? ***[UPSC Pre. Practice Question]***

(a) 1, 2, and 3 only (b) 1, 3, and 4 only

(c) 2 and 4 only (d) 1, 2, 3, and 4

Ans. (b) 1, 3, and 4 only

5.11.5. HIMACHAL'S FIRST SOLAR MODEL VILLAGE – RAJA KHAS

Why in the News?

Raja Khas village in Kangra district, Himachal Pradesh, has been declared the state's first solar model village, marking a significant step toward rural energy self-reliance and sustainable development in the Himalayan region.

Himachal Pradesh's First Solar Model Village: Raja Khas

Nestled in the Indora block of Kangra district, Raja Khas has emerged as a pioneering example of rural clean energy adoption under the PM Surya Ghar Muft Bijli Yojana. Among 43 villages selected, Raja Khas stands out for achieving the highest solar power capacity, setting a benchmark for sustainable energy transformation in the state.

Key Features of the Solar Model Village

- **Funding and Infrastructure:** The village received a central grant of ₹1 crore to develop solar infrastructure, including a solar power plant, solar street lighting, and solar water heaters.
- **Solarization of Public Institutions:** All government-run facilities such as schools, panchayat offices, health centres, anganwadis, and community halls are now powered by solar energy.
- **Community Participation:** The model encourages active community involvement in maintenance and wider adoption of solar technologies, ensuring sustainability and local ownership.

Significance of Raja Khas as a Solar Model Village

- **Clean Energy Access:** Promotes renewable and decentralized energy, reducing dependence on conventional fossil fuels and cutting carbon emissions.
- **Rural Self-Reliance:** Empowers the village to meet its energy needs sustainably, enhancing resilience and reducing energy costs.
- **Replicable Model:** Serves as a blueprint for other hill and rural areas to transition toward green energy solutions.
- **Local Empowerment:** Strengthens grassroots governance and climate-conscious decision-making, fostering environmental stewardship.

Raja Khas exemplifies how solar energy can drive rural sustainability, empower communities, and serve as a replicable model for India's green energy transition.

Q. "Discuss the importance of solar model villages like Raja Khas in promoting sustainable rural development and energy self-reliance in India." ***[UPSC MAINS Practice Question]***

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SCIENCE & TECHNOLOGY

6.1. BHARAT GEN' – INDIA' S FIRST INDIGENOUSLY AI BASED MULTIMODAL LLM

Why in the News?

Recently, the Ministry of Science & Technology has launched "BharatGen," the world's first government-funded multimodal large language model, developed by IIT Bombay under NM-ICPS. BharatGen aims to enhance public service and citizen engagement using AI tailored to India's diverse languages and cultures.

BharatGen: India's Indigenous Multimodal AI Revolution

BharatGen represents a pioneering step towards building India-centric foundational AI models that process language, speech, and computer vision data across multiple modalities. Unlike conventional language models that primarily handle text, BharatGen's multimodal design enables it to understand and generate information through text, speech, and images, offering a holistic AI solution.

Key Features:

- **Multilingual & Multimodal:** Designed to support India's vast linguistic diversity by training on rich, India-specific datasets.
- **Open Source:** The platform will be openly accessible to encourage research, innovation, and broad-based AI development within India.
- **Government-led & Atmanirbhar:** Aligning with the Atmanirbhar Bharat vision, it strengthens India's data sovereignty and reduces dependence on foreign AI technologies.
- **Completion Target:** Expected to be fully developed by 2026, with ongoing expansions in AI applications across sectors.

Significance:

BharatGen ensures AI technology is more inclusive by representing underserved Indian languages and dialects often neglected in global models. It empowers government agencies, educational institutions, and private enterprises with customized AI tools, driving efficiency and innovation while preserving India's digital autonomy.

What are Large Language Models (LLMs)?

LLMs are deep learning AI models pre-trained on massive datasets to understand, interpret, and generate human language. Their advanced capabilities extend beyond text, incorporating structured and unstructured data such as speech and images. This makes them valuable across sectors including healthcare, customer service, and education.

BharatGen stands as a landmark project, reflecting India's commitment to harnessing AI tailored to its unique needs and fostering technological self-reliance for a digital future.

Q. Discuss the significance of BharatGen, India's first government-funded multimodal large language model, in promoting AI-driven public service delivery and linguistic inclusivity.

[UPSC MAINS Practice Question]

6.2. INDIA'S RARE EARTH MAGNETS CRISIS

Why in the News?

Recently, China's export restrictions on rare earth magnets threaten India's automobile and defense sectors, highlighting India's dependence on China for these critical materials.

India's Rare Earth Magnets Crisis: Challenges and Imperatives

Rare earth magnets, primarily made from elements such as neodymium and samarium, are vital components in modern technology. Despite their name, rare earth elements are relatively abundant in the earth's crust but are difficult to extract economically due to dispersed deposits and environmentally sensitive mining processes.

Key Uses of Rare Earth Magnets:

- **Electric Vehicles:** Essential for Permanent Magnet Synchronous Motors (PMSMs) that provide high torque, efficiency, and compactness to EV propulsion.
- **Internal Combustion Engine Vehicles:** Used in power steering, electric windows, cooling fans, and various sensors.
- **Defense Sector:** Integral in guidance systems, missile actuators, and radar technology.
- **Consumer Electronics:** Found in smartphones, speakers, and hard drives.

India's Current Position:

China dominates over 85% of the global rare earth magnet supply chain, controlling mining, refining, and manufacturing. India, though rich in rare earth reserves—particularly monazite sands found in Kerala, Tamil Nadu, and Odisha—faces several challenges:

- Lack of advanced refining infrastructure.
- Absence of a downstream magnet manufacturing industry.
- Insufficient R&D investment and limited private sector engagement.

Way Forward:

- Invest in advanced refining technologies to process rare earth elements domestically.
- Develop and expand domestic rare earth magnet manufacturing capacities.
- Promote research and innovation in rare earth materials and magnet technologies.
- Forge strategic partnerships with global and domestic stakeholders to secure supply chains.
- Implement sustainable and environmentally responsible mining practices.
- Encourage private sector participation and public-private collaborations in the rare earth sector.

Building a robust and self-reliant rare earth magnet ecosystem is vital for India's technological advancement, industrial growth, and national security, reducing dependence on external suppliers and enhancing resilience.

Q. Consider the following statements regarding rare earth magnets:

1. Neodymium and samarium are key elements used in their production.
2. Rare earth elements are geologically rare and found in very limited deposits worldwide.
3. China controls the majority of global rare earth magnet production.

Which of the statements is/are correct? ***[UPSC Pre. Practice Question]***

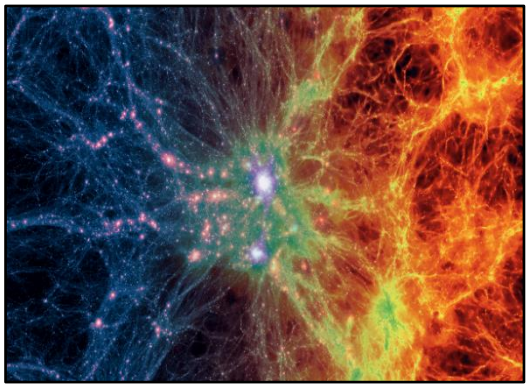
(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2, and 3

Ans. (b) 1 and 3 only

6.3. SCIENTISTS FINALLY FOUND THE UNIVERSE'S MISSING MATTER

Why in the News?

A new **landmark study** conducted by **Harvard, Smithsonian (CfA)** and **Caltech** has, for the first time, **detected the universe's missing ordinary (baryonic) matter** using powerful cosmic signals known as **Fast Radio Bursts (FRBs)**.



Ordinary (Baryonic) Matter Vs Dark Matter

- **Ordinary Matter (Baryonic Matter):** Comprises gas, dust, stars, planets, and everyday substances like water.
  - Interacts with electromagnetic radiation (i.e., light), making it visible.
  - Accounts for approximately 15% of all matter in the universe.
  - Made up of baryons, such as protons and neutrons.

Distribution of Ordinary Matter	
Component of Universe	**Share of Ordinary Matter**
Intergalactic Medium (IGM)	76%
Galaxy Halos	15%
Within Galaxies (Stars, Dust)	9%

- **Dark Matter:** A mysterious, invisible substance that forms around 85% of the universe's matter.
  - Does not interact with light, hence cannot be directly observed.
  - Interacts very weakly or not at all with ordinary matter.
- **Similarities:**
  - Both have mass and occupy space.
  - Both exert gravitational force, influencing the structure and behavior of the universe.

What is Fast Radio Bursts (FRBs)?

- **Definition**: Short, intense bursts of electromagnetic radiation in **radio waves** from distant galaxies.
- **Duration**: Range from milliseconds to a few seconds.
- **Significance**: Proven to be a **reliable cosmological probe** for detecting matter distribution across space.

Role of FRBs in Tracing Missing Matter

- Fast Radio Bursts (FRBs), acting as **cosmic beacons**, disperse into various wavelengths as they travel through space—**like light through a prism.**
- The level of dispersion reveals the amount of matter they pass through, allowing scientists to directly **map matter distribution across the universe** and confirm FRBs as an **effective cosmological probe**.

Q. Consider the following statements regarding Fast Radio Bursts (FRBs):

1. FRBs are long-duration bursts of visible light from nearby galaxies.
2. FRBs are used to map the distribution of matter in the universe.
3. FRBs are considered a useful cosmological probe.

Which of the statements given above is/are correct? ***[UPSC Pre. Practice Question]***

(a) 1 and 2 only (b) 2 and 3 only

(c) 1 and 3 only (d) 1, 2 and 3

Ans. (b) 2 and 3 only

6.4. INDIA'S LEAP IN GLOBAL ANIMAL HEALTH: SECURING RINDERPEST CONTAINMENT

Why in the News?

India's ICAR-National Institute of High Security Animal Diseases (**NIHSAD**) in Bhopal has been designated a **Category A Rinderpest Holding Facility** (RHF) by the World Organisation for Animal Health (WOAH) and the UN's Food and Agriculture Organization (FAO). This places India among just six countries globally entrusted with safeguarding Rinderpest Virus-Containing Material (RVCM).

Historical Context

- **Definition and Nature**:
  - Rinderpest, known as "**cattle plague**," is a highly contagious viral disease caused by a Morbillivirus from the Paramyxoviridae family.
  - It primarily affects cloven-hoofed animals, especially cattle and buffalo, with mortality rates up to 100% in susceptible herds.
- **Transmission and Symptoms**:
  - Transmitted through direct contact via nasal secretions and other body fluids.
  - Symptoms include fever, mouth lesions, nasal and ocular discharge, diarrhea, and dehydration, often leading to death within 10–15 days.
- **Impact on Other Species**:
  - Milder effects in sheep, goats, and certain wild animals like zebus, antelopes, and giraffes.
  - Catastrophic impact on cattle and buffalo populations.
  - One of the most destructive livestock diseases until its global eradication in 2011.
- **Post-Eradication Status**:
  - Eradication marked a landmark achievement in veterinary science.
  - Rinderpest virus-containing material (RVCM) stored in select high-security laboratories, posing risks if mishandled.

Government Initiative

- **Designation of ICAR-NIHSAD**:
  - In 2012, India designated ICAR-NIHSAD as the national repository for RVCM.
  - NIHSAD is a Biosafety Level-3 (BSL-3) facility and a WOAH reference laboratory for avian influenza.
- **Evaluation and Certification**:
  - Underwent rigorous evaluation, culminating in a joint FAO and WOAH.
  - Earned Category A Rinderpest Holding Facility (RHF) status for a one-year term due to robust biosafety protocols, meticulous inventory control, and comprehensive emergency preparedness.
- **Biosecurity Measures**:
  - Stringent protocols established at NIHSAD for secure storage and research of RVCM.
  - Ensures compliance with global biosecurity standards.

Way Forward

- **Maintaining Category A RHF Status**:
  - India must uphold high standards of biosecurity and inventory management at NIHSAD.
  - Regular evaluations by WOAH and FAO to ensure compliance with global protocols are conducted.
- **Research and Collaboration**:
  - Ongoing research at NIHSAD could advance veterinary science.

- Collaboration with other Category A RHF facilities in the UK, USA, France, Japan, and Ethiopia to prevent rinderpest re-emergence.

- **Significance**:
  - Enhances India's stature in global animal health.
  - Underscores the importance of sustained investment in high-security laboratories.

India's designation as a Category A Rinderpest Holding Facility (RHF) marks a major step in global efforts to prevent the return of rinderpest. It highlights India's commitment to biosecurity and veterinary public health by meeting top standards for safely managing the virus. This recognition strengthens global disease preparedness and reinforces India's leadership in animal health.

Q. Critically examine how India's designation as a Rinderpest Holding Facility contributes to global health diplomacy. What strategic advantages does it offer in strengthening India's role in international veterinary and biosafety governance? ***[UPSC Mains Practice Question]***

6.5. INDIA TO BE WORLD'S 4TH LARGEST ELECTRIC CAR MAKER BY 2030

Why in the News?

India is witnessing a remarkable surge in its electric vehicle (EV) manufacturing capacity. According to a recent report by the **Rhodium Group**, India's planned production of electric four-wheelers is projected to **increase over tenfold** to reach **2.5 million units by 2030**, making it one of the fastest-growing EV hubs globally.

India's Rising Position in the Global EV Landscape

- **Aiming for Global Leadership:** By 2030, India is expected to become the **fourth-largest electric car manufacturer**, trailing only behind **China**, the **European Union**, and the **United States**. This positioning reflects India's aggressive industrial push combined with strategic trade policies and investment in localisation.

Factors Driving India's EV Manufacturing Growth

1. **Capacity Expansion**
   - Current EV four-wheeler capacity: **0.2 million units**
   - Planned capacity by 2030: **2.5 million units**
   - Growth: **Over 10 times**
2. **Domestic Demand vs Supply**

Metric	Estimate by 2030
Domestic EV Demand	0.4 to 1.4 million units
Planned Production Capacity	2.5 million units
Surplus Production	1.1 to 2.1 million units

This production surplus opens a major **export opportunity**, especially if India can lower manufacturing costs and compete globally, particularly against **Chinese EVs**.

Role of Indian Automakers

Indian manufacturers are currently dominating the domestic EV market:

- **Tata Motors**, **MG Motor**, and **Mahindra** contributed nearly **90%** of India's EV sales in 2024–25.
- **EV penetration** in 2024 stood at just **2%**, indicating massive potential for future growth.

Despite the low market share, India is outpacing countries like **Japan** and **South Korea** in **planned manufacturing capacity**.

Government Policy Framework and Industrial Strategy

India's EV boom is closely tied to **policy-driven industrial development**:

Policy Tool	Objective
Consumer Subsidies	Incentivise domestic purchases and localisation
Production-Linked Incentives (PLI)	Promote battery and component manufacturing
High Import Tariffs (70–100%)	Protect domestic firms from global competition
Charging Infrastructure Push	Support EV adoption nationwide

While these steps help grow local production, they also raise **consumer prices** and limit **vehicle options**.

Battery Manufacturing: Progress and Challenges

- **Module and Cell Production:** India is rapidly scaling up in the **battery module segment**, emerging as the **largest producer outside** China, the EU, and the US. However, most of this growth depends on **projects under development**, so implementation remains a key concern.

Global Cell Manufacturing Capacity (2030 Estimate)

Country/Region	Capacity (GWh)
China	4,818
USA	1,169
Europe	997
India & Others	567

While India will **surpass Japan, South Korea, and Malaysia**, it will still trail **China**, **Europe**, and **North America** in cell production.

Comparative Global EV Manufacturing Capacity by 2030

Country/Region	Projected EV Production (Units)
China	29 million
European Union	9 million
United States	6 million
India	2.5 million
South Korea	1.9 million
Japan	1.4 million

India is projected to **leap ahead of Japan and South Korea**, which currently have more operational plants but fewer expansion plans.

India's electric vehicle sector is undergoing a **transformational shift**, propelled by aggressive policy support, industrial planning, and market-driven innovation. The country is positioning itself not just as a large consumer but as a **global manufacturing and export hub**.

However, success in this space will require:

- Efficient execution of battery and EV plant projects
- Competitive pricing against global rivals
- Continued support for R&D and supply chain localisation

If managed well, India could emerge as a **major player in the global EV revolution**, contributing to both economic growth and climate resilience.

Q. *"India's electric vehicle sector is not just a climate imperative but an industrial opportunity."* Discuss the key drivers of growth in India's EV manufacturing sector and highlight the challenges that must be addressed to position India as a global EV export hub.

[UPSC MAINS Practice Question]

6.6. NAKSHATRA: SUPERCOMPUTING LEAP FOR GENOMIC INNOVATION

Why in the News?

The Indian Council of Medical Research (ICMR) has introduced **NAKSHATRA**, a high-performance computing (HPC) system located at the National Institute of Virology (NIV) in Pune, to revolutionize India's capacity in genomic research and disease surveillance.

What is NAKSHATRA?

NAKSHATRA is a state-of-the-art computational facility set up to process large-scale biological data rapidly. Developed under the **Pradhan Mantri Ayushman Bharat Health Infrastructure Mission (PM-ABHIM)**, it aims to bolster India's preparedness against emerging infectious threats by enhancing genomic surveillance.

Host Organization: ICMR

- **Indian Council of Medical Research (ICMR)** is India's apex body for promoting and coordinating biomedical research.
- Originated as the **Indian Research Fund Association (IRFA)** in 1911, it was renamed ICMR in 1949.
- It operates under the **Ministry of Health and Family Welfare**, funded through the Department of Health Research.
- ICMR launched India's **Clinical Trials Registry** in 2007 to ensure transparency and accountability in clinical trials.

Key Features of NAKSHATRA HPC Facility

- Set up at **NIV Pune**, this facility comprises **12 compute nodes**, with **700 computing cores** and **1 petabyte of storage**, supporting intensive bioinformatics operations.
- It drastically cuts down data processing time for genome analysis—from months to just **1–2 days**.
- It facilitates advanced computational research in:
  - **Next-Generation Sequencing (NGS)**
  - **Transcriptomics** (comprehensive RNA studies)
  - **Phylogenetics** (evolutionary studies)
  - **Metagenomics** (analysis of genetic material from environmental samples)
  - **Structural Bioinformatics**

Strategic Importance

- **Rapid Disease Detection**: The supercomputing capacity enables timely identification of emerging pathogens, strengthening outbreak preparedness.
- **Faster Biomedical Discoveries**: It provides infrastructure for developing **AI-based vaccines and therapeutics**, enhancing research speed and precision.
- **National Health Resilience**: NAKSHATRA boosts India's genomic monitoring systems for diseases like **Nipah**, **Zika**, and **avian flu (H5N1)**, contributing to the broader vision of **Viksit Bharat 2047**—a future-ready, health-secure India.

Q. With reference to the NAKSHATRA computing facility, consider the following statements:

1. It has been set up by ICMR at its virology institute in Pune.
2. Its main focus is to upgrade infrastructure for regular laboratory-based disease testing.
3. It plays a key role in expediting AI-based vaccine and drug innovation.

How many of the above statements are accurate? ***[UPSC Pre. Practice Question]***

(a) Only one (b) Only two

(c) All three (d) None

Ans. (b) Only two

6.7. NEWS IN SHORTS

6.7.1. SYNTHETIC APERTURE RADAR

Why in the News?

On June 12, 2025, NASA announced that the **NASA-ISRO Synthetic Aperture Radar (NISAR)** satellite had arrived at ISRO's launch facility in **Sriharikota**. The mission is now in its final stage before launch.

Background of the News

Once deployed, NISAR will use dual-frequency Synthetic Aperture Radar (SAR) to scan nearly all of Earth's land and ice surfaces **twice every 12 days**, delivering high-resolution, real-time data on the planet's dynamic systems — including ecosystems, crustal movements, glaciers, and sea level changes.

About Synthetic Aperture Radar (SAR)

- **Definition:** Synthetic aperture radar (SAR) is a type of **active data collection** where an instrument sends out a pulse of energy and then records the amount of that energy reflected back after it interacts with Earth.
  - It is a way to make sharp pictures even when it's dark or cloudy.
- **Creation of SAR Imagery:** Unlike optical imagery, which is a passive data collection technique based on emitted energy, SAR imagery is created from the reaction of an emitted pulse of energy with physical structures (like mountains, forests, and sea ice) and conditions like soil moisture.
- **Applications:** SAR has been used in a wide range of applications, including studying Antarctic icebergs, tracking the paths of oil spills into sensitive marshes, and mapping the wetlands of Alaska.

Working of Synthetic Aperture Radar (SAR)

- **Key Element:** The key element is the antenna that receives the echoes. Typically, a longer physical antenna gives better resolution, but building and maintaining a large antenna is difficult.
- **Synthetic Aperture Simulation**: SAR uses a small antenna mounted on a moving satellite to record echoes from multiple positions. These are stitched together using precise timing and phase data to simulate a large antenna, enhancing resolution.
- **All-Weather, Day-Night Capability**: SAR operates with microwave signals that can penetrate clouds, smoke, and light rain, allowing for continuous 24/7 data collection.
- **High-Resolution Surface Imaging**: It can map vast land areas—hundreds of kilometres wide in a single pass—with high accuracy, regardless of atmospheric conditions.
- **Material Differentiation**: Different surfaces (soil, vegetation, water, metals) reflect microwaves differently, enabling SAR to detect subtle changes that optical sensors may miss.

Q. Which of the following are valid applications of Synthetic Aperture Radar (SAR)?

1. Mapping wetlands and forests
2. Tracking oil spills in sensitive marshes
3. Monitoring Antarctic iceberg movement
4. Detecting earthquakes in real time

Select the correct answer using the code below: ***[UPSC Pre. Practice Question]***

(a) 1, 2 and 3 only (b) 2 and 4 only

(c) 1, 3 and 4 only (d) 1, 2, 3 and 4

Ans. (d) 1, 2, 3 and 4

6.7.2. ISRO'S SMALL SATELLITE LAUNCH VEHICLE (SSLV)

Why in the News?

For the first time in India's space journey, the complete technology of ISRO's Small Satellite Launch Vehicle (SSLV) is being handed over to a private Indian firm. Hindustan Aeronautics Limited (HAL), a public sector aerospace giant, has secured this landmark technology transfer, allowing it to take full control of the SSLV's development, production, and commercial deployment.

SSLV Technology Transfer

- The Small Satellite Launch Vehicle (SSLV) is a compact, cost-effective launch platform developed by ISRO, specifically aimed at catering to the growing market for small satellite launches. Now, for the first time, this entire technology is being formally transferred from ISRO to an Indian entity outside the organization.
- HAL will not only be able to manufacture the SSLV independently but will also be permitted to market and operate it commercially. This marks a significant step in boosting the involvement of India's private sector in space-related activities.

Who Is Involved in the Transfer?

This technology transfer is the result of a coordinated effort among several key stakeholders in India's space ecosystem:

- **ISRO (Indian Space Research Organisation)**: The developer and current operator of the SSLV.
- **IN-SPACe (Indian National Space Promotion and Authorization Center)**: The space sector regulator facilitating private participation.

- **NSIL (NewSpace India Limited)**: ISRO's commercial arm overseeing monetization of space assets.
- **HAL (Hindustan Aeronautics Limited)**: The recipient of the technology and now the sole owner and future operator of SSLV.

Strategic Significance and Production Capability

- This move is part of a larger push to open up India's space sector to private players. The goal is to expand commercial satellite launch services, reduce ISRO's operational load, and enable companies like HAL to tap into the growing global demand for small satellite launches.
- Once the technology is fully absorbed, HAL plans to manufacture between **six to ten SSLV rockets each year**, making it a prominent player in the global small satellite launch segment.

About Hindustan Aeronautics Limited (HAL)

- HAL, India's premier aerospace and defence enterprise, has a rich legacy spanning over eight decades. Established in 1940 in Bengaluru, the company has played a pivotal role in building India's air and space capabilities. Operating under the **Ministry of Defence**, HAL has been instrumental in producing key aircraft such as the MiG-21, Jaguar, Su-30MKI, and the indigenously developed LCA Tejas.
- In addition to its aircraft and helicopter divisions, HAL is a vital contributor to India's space missions. The company provides critical hardware for ISRO's rockets, including structures for the GSLV Mk-III, components for the Mars Orbiter Mission, and systems for the upcoming Human Spaceflight Program. HAL also supports cryogenic engine development and space launch vehicle fabrication.
- Publicly listed since 2018, HAL continues to expand its presence in both defence and space manufacturing, with multiple divisions across the country dedicated to MRO services, avionics, composites, and now, independent space launch capability through SSLV.
- This groundbreaking SSLV technology transfer not only strengthens HAL's role in India's space ecosystem but also marks a new era of privatization and commercialization in Indian space ventures. By empowering firms like HAL to take the lead, India is positioning itself to be a major global player in affordable and reliable satellite launches.

Q. Consider the following:

List-I	List-II
A. ISRO	1. Commercial arm responsible for monetizing space assets
B. IN-SPACe	2. Developer of the SSLV and current operator
C. NSIL	3. Space sector regulator facilitating private sector participation
D. HAL	4. Recipient of SSLV technology, now responsible for production and operation

Choose the correct options given below: ***[UPSC Pre. Practice Question]***

(a) A-2, B-3, C-1, D-4 (b) A-3, B-2, C-4, D-1

(c) A-1, B-4, C-2, D-3 (d) A-4, B-1, C-3, D-2

Ans. (a) A-2, B-3, C-1, D-4

6.7.3. CYBER SURAKSHA

Why in the News?

India has rolled out a major national-level cybersecurity initiative named **'Cyber Suraksha'**, introduced by the Defence Cyber Agency (DCyA). The multi-stage exercise is designed to enhance the nation's preparedness against evolving cyber threats, particularly within the defence sector.

About Cyber Suraksha

Cyber Suraksha is a comprehensive cybersecurity simulation crafted to mirror real-life cyber threat scenarios. Set in a dynamic and gamified framework, the drill aims to evaluate and strengthen the capabilities of national defence personnel and institutions in dealing with sophisticated cyber incidents.

Who Initiated It

The exercise is spearheaded by the **Defence Cyber Agency (DCyA)**, an integral arm of India's Ministry of Defence, responsible for overseeing the cyber defence posture of the armed forces.

Primary Objectives

- Reinforce cybersecurity resilience across national defence systems.
- Equip security personnel with the skills to counter modern and complex cyberattacks.
- Promote a proactive cybersecurity culture across military establishments.

Key Components of the Exercise

- **Training Modules:** Participants undergo intensive and targeted learning to understand and mitigate cyber threats.
- **Assessment and Evaluation:** The programme includes detailed performance evaluations to identify gaps and strengths.
- **Leadership Development:** Special sessions are held for decision-makers through leadership capsules and strategic briefings.
- **CISOs Conclave:** A high-level forum for Chief Information Security Officers to discuss policies, strategic insights, and cyber risk frameworks.
- **Simulated Decision-Making:** Table-Top Exercises mimic high-stakes crisis scenarios requiring real-time decisions and coordination.
- **Interactive Learning:** Combines formal instruction with hands-on experiences to ensure practical knowledge transfer and readiness.

Defence Cyber Agency (DCyA)

What It Does:

DCyA functions as a tri-service organisation integrating cyber defence efforts across the Indian Army, Navy, and Air Force. It plays a critical role in developing and executing cyber strategies for military security.

When It Was Formed:

The agency became fully operational in **November 2019**.

Core Mission:

- To shield India's military networks and digital infrastructure from cyber intrusions and attacks.
- To foster collaborative cyber capabilities across the armed forces.

Key Responsibilities:

- Serves as the primary body for cyber operations and incident response within the defence ecosystem.
- Coordinates intelligence gathering, cyber threat mitigation, and strategic response planning.
- Facilitates training programmes, conducts security audits, and performs threat analysis for defence installations.
- Operates under the **Chief of Defence Staff (CDS)** through the **Integrated Defence Staff (IDS)**.

Q. What are the objectives of the 'Cyber Suraksha' initiative launched by India's Defence Cyber Agency? How does it contribute to strengthening national defence cybersecurity?

[UPSC MAINS Practice Question]

6.7.4. STAR A980

Why in the News?

Researchers from the Indian Institute of Astrophysics (IIA), Bengaluru have discovered a rare helium-dominated star named **A980**, notable for its unusual elemental makeup, which poses a challenge to established theories of how stars evolve and produce elements.

About Star A980

Located in the Ophiuchus constellation, Star A980 is situated roughly 25,800 light years away from Earth. It is classified as a cool Extreme Helium (EHe) star, a rare type of evolved star composed predominantly of helium and nearly devoid of hydrogen. These stars are believed to originate from the merger of two white dwarfs—one rich in helium and the other in carbon and oxygen.

Scientific Significance of the Discovery

- This star is the first of its kind where scientists have observed **singly-ionized germanium (Ge II)**, with the concentration of germanium recorded at **eight times higher** than that found in our Sun. Traditionally, stellar models predict that such heavy elements form either during supernova explosions or in Asymptotic Giant Branch (AGB) stars—not in EHe stars.
- The presence of such elevated germanium levels in an EHe star like A980 points to a **new potential pathway of element formation**, possibly occurring during white dwarf mergers. This finding highlights a gap in existing stellar evolution theories and suggests that current models may need significant updates to incorporate such phenomena.

Indian Institute of Astrophysics (IIA)

The **Indian Institute of Astrophysics (IIA)**, operating under the **Department of Science and Technology (DST)**, is a leading research body focused on astronomy, astrophysics, and allied disciplines. The institute originated from the **Madras Observatory**, established in **1786**, later moved to **Kodaikanal in 1899**, and was renamed IIA in **1971**. Since **1975**, its headquarters has been located in **Bengaluru**.

Q. Star A980, recently discovered by researchers from the Indian Institute of Astrophysics, is notable because: ***[UPSC Pre. Practice Question]***

(a) It is the closest star to Earth in the Ophiuchus constellation.

(b) It is a cool Extreme Helium star with unusually high levels of singly-ionized germanium.

(c) It is composed mainly of hydrogen and oxygen and is a newly formed star.

(d) It confirms that heavy elements form only during supernova explosions.

Ans. (b) It is a cool Extreme Helium star with unusually high levels of singly-ionized germanium.

6.7.5. OPERATION MIDNIGHT HAMMER

Why in the News?

The United States recently executed a high-profile military operation, codenamed Midnight Hammer, targeting critical nuclear infrastructure in Iran.

Overview of Operation Midnight Hammer

- **What is it:** A secretive U.S. military campaign aimed at neutralizing Iran's nuclear facilities through precision strikes.
- **Initiated by:** U.S. Department of Defense.
- **Purpose:** To significantly impair Iran's nuclear weapon development and assert U.S. air dominance.

Weapons Deployed:

- **B-2 Spirit Stealth Bombers:** Equipped with GBU-57A/B Massive Ordnance Penetrators, designed to destroy fortified targets.
- **Tomahawk Cruise Missiles:** Launched from a U.S. submarine for long-range precision strikes.
- **Support Aircraft:** Decoy planes and fighter jets to neutralize enemy air defenses.

B-2 Spirit Stealth Bomber

What is it: A cutting-edge, low-observable strategic bomber in the U.S. Air Force, capable of delivering both conventional and nuclear payloads with near-undetectable radar signatures.

Developed by: Northrop Grumman in the late 1980s.

Key Specifications:

- **Cost:** Approximately $2.1 billion per aircraft, making it the priciest in the world.
- **Range:** Capable of flying over 6,000 nautical miles without refueling, enabling global operations.
- **Payload Capacity:** Up to 40,000 lbs, including two GBU-57A/B bunker-buster bombs or 16 B83 nuclear warheads.
- **Crew:** Operated by two pilots with highly automated systems.
- **Stealth Features:** Minimal radar cross-section, comparable to a small bird, allowing it to bypass sophisticated air defense systems.

Armament:

- **Massive Ordnance Penetrator (MOP):** A 30,000-lb bomb designed to penetrate over 200 feet of reinforced concrete.

- **Other Weapons:** Includes JDAM, JSOW, and JASSM-ER for diverse conventional missions, plus nuclear warheads for strategic deterrence.

Strategic Importance:

- Showcases U.S. ability to conduct precise, high-impact strikes on fortified targets.
- Reinforces U.S. global military dominance and deterrence capabilities.
- Proven in operations across regions like Afghanistan, Libya, and now Iran.

Q. Recently seen in news, "Operation Midnight Hammer" is related to:

[UPSC Pre. Practice Question]

(a) A counter-insurgency operation in Northeast India

(b) A crackdown on illegal cyber activities across multiple states

(c) An anti-narcotics operation by the Indian Navy in the Arabian Sea

(d) Military campaign aimed at neutralizing Iran's nuclear facilities

Ans. (d) Military campaign aimed at neutralizing Iran's nuclear facilities

6.7.6. KOUNIS SYNDROME

Why in the News?

The recent passing of a well-known Indian business magnate due to a bee sting has sparked widespread discussion about Kounis Syndrome, a rare condition linking severe allergic reactions to sudden cardiac events, even in seemingly healthy individuals.

Kounis Syndrome

Kounis Syndrome is an uncommon medical condition where an allergic reaction precipitates a cardiac issue. It falls under the umbrella of Acute Coronary Syndrome (ACS), which encompasses heart attack-like conditions triggered by an immune response. Often dubbed allergic angina or allergic heart attack, it arises when an allergen prompts a cascade of physiological responses affecting the heart.

Mechanism: Exposure to certain triggers activates the body's immune system, particularly mast cells, which release potent chemicals like histamine and cytokines. These substances can:

- Induce spasms or constriction in the coronary arteries.
- Destabilize or rupture pre-existing arterial plaques, exacerbating blockages.
- Restrict blood supply to the heart, causing ischemia (oxygen deprivation) or infarction (tissue damage).

Variants of Kounis Syndrome

- **Type I:** Affects individuals with healthy coronary arteries. The allergic response triggers arterial spasms, reducing blood flow and potentially causing a heart attack.
- **Type II:** Occurs in those with pre-existing coronary artery disease. The allergic reaction aggravates plaques, leading to their rupture and a severe heart attack.
- **Type III:** Involves patients with coronary stents, where an allergic reaction may cause clot formation within the stent, obstructing blood flow.

Potential Triggers

Kounis Syndrome can be sparked by various allergens, including:

- Bites or stings from insects like bees or wasps.

- Medications, such as antibiotics or non-steroidal anti-inflammatory drugs (NSAIDs).
- Foods like nuts, shellfish, or kiwi.
- Environmental allergens, including latex or medical contrast dyes.
- Pre-existing conditions like mastocytosis, which involves an overabundance of mast cells.

Symptoms

Individuals with Kounis Syndrome may experience:

- Chest discomfort or pain.
- Skin reactions like rashes, hives, or swelling (angioedema).
- Breathing difficulties or wheezing.
- Low blood pressure.
- Electrocardiogram (ECG) abnormalities, such as ST-segment changes indicating heart stress.

Treatment Approaches

Managing Kounis Syndrome requires addressing both the allergic and cardiac components:

- **Allergic Reaction Treatment:** Administering antihistamines, corticosteroids, or epinephrine to control the immune response.
- **Cardiac Care:** Providing oxygen, nitrates, and anticoagulants to stabilize heart function, following standard protocols for acute coronary events.

Q. Kounis Syndrome has highlighted the complex interplay between allergic reactions and cardiovascular health. In the context of recent incidents, discuss the pathophysiology, variants, and clinical significance of Kounis Syndrome. What implications does it have for emergency medical care and public awareness in India? ***[UPSC MAINS Practice Question]***

6.7.7. GWADA NEGATIVE

Why in the News?

France's blood authority, the Établissement Français du Sang (EFS), has unveiled a novel blood group system, informally termed "Gwada negative," which has earned global recognition from the International Society of Blood Transfusion (ISBT). This discovery marks a significant milestone in transfusion medicine.

About Gwada Negative

- Formally known as EMM-negative, this blood group system is nicknamed "Gwada negative" to honor the Guadeloupean heritage of its sole known carrier, a woman from the Caribbean island. It is officially cataloged by the ISBT as ISBT042, defined by the absence of the EMM antigen—a high-frequency antigen typically present on red blood cells in nearly all individuals.
- **Significance of Absence:** The lack of the EMM antigen, a high-incidence marker, renders this blood type exceptionally rare and medically critical, as it poses unique challenges for blood transfusions.
- **Criteria for Recognition:** A new blood group system must be genetically inherited, detectable through serological or molecular methods, and associated with a specific antibody. The EMM-negative system fulfills these standards, securing its place as the 48th recognized blood group system worldwide, expanding the previous tally of 47 systems.
- **Uniqueness of the Case:** Currently, the Guadeloupean woman is the only identified individual with this blood type globally. Her condition stems from inheriting a rare genetic mutation from both parents, each carrying a single copy of the variant, resulting in the complete absence of the EMM antigen in her red blood cells.

International Society of Blood Transfusion (ISBT)

Establishment: Founded in 1935 in Paris, France.

Objectives:

- Tackles scientific and operational challenges in blood transfusion.
- Fosters collaboration among professionals in the field.
- Promotes standardization of techniques, equipment, and protocols to enhance transfusion safety and efficacy.

Headquarters: Located in Amsterdam, Netherlands.

Q. With reference to the recently discovered "Gwada Negative" blood group system, consider the following statements:

1. It is officially recognised as the 48th blood group system by the International Society of Blood Transfusion (ISBT).
2. The system is characterised by the presence of the EMM antigen, which is rare in humans.
3. It was discovered in a woman of Guadeloupean origin who inherited the rare gene from only one parent.
4. High-incidence antigens are typically absent in most human populations.

Which of the statements given above is/are correct? ***[UPSC Pre. Practice Question]***

(a) 1 only (b) 1 and 3 only

(c) 2 and 4 only (d) 1, 2 and 4

Ans. (a) 1 only

*****

ART & CULTURE

7.1. POSON POYA

Why in the News?

Sri Lanka recently released several prisoners pardoned by President Gotabaya Rajapaksa to mark **Poson Poya**, a deeply significant Buddhist festival commemorating the island's introduction to Buddhism.

What is Poson Poya?

Poson Poya marks the arrival of **Arahat Mahinda Thero** in the 3rd century BCE, who brought the teachings of the Buddha to Sri Lanka. It is the **second most sacred Buddhist day** in the country, celebrating the birth of Buddhism on the island.

Cultural and Spiritual Significance

Observed mainly in **Anuradhapura**, the festival includes **pilgrimages, meditation, alms-giving (Dansalas), and Dhamma sermons**. Devotees dress in white, reflect on moral teachings, and perform acts of kindness and charity.

Symbol of Forgiveness and Renewal

The presidential pardon symbolizes **compassion and spiritual cleansing**, aligning with the core Buddhist values of **forgiveness, peace, and unity**.

More than a religious observance, **Poson Poya** reflects Sri Lanka's enduring commitment to Buddhist values and national harmony, offering a moment of **reflection, renewal, and shared purpose**.

Q. Poson Poya, an important Buddhist festival celebrated in Sri Lanka, commemorates:
[UPSC Pre. Practice Question]

(a) The birth of Lord Buddha
(b) The arrival of Arahat Mahinda Thero and introduction of Buddhism to Sri Lanka
(c) The first sermon of Buddha at Sarnath
(d) The establishment of the Buddhist monastic order (Sangha)

Ans. (b) The arrival of Arahat Mahinda Thero and introduction of Buddhism to Sri Lanka

7.2. NONIA REBELLION

Why in the News?

Union Agriculture, Farmers' Welfare, and Rural Development Minister Shri Shivraj Singh Chouhan took part in the 100th anniversary commemoration of martyr Buddhu Nonia held in Patna, Bihar. He lauded the **Nonia community's contribution** through their role in the **Nonia Rebellion of the 18th century**.

About the Nonia Rebellion

Aspect	Details
Period	Around **1770**, continued for **~30 years**
Region	Epicentre in **Hajipur, Tirhut, Saran, and Purnia** regions of **Bihar**

Community Involved	**Lonia (Nonia)** community
Objective	To **drive out British rule**
Background	Linked with **salt-making communities**—word "Lonia" comes from Sanskrit "Lavan" (salt)
Economic Role	Associated with production of **saltpetre, sulfur, and acid**
Legacy	An example of **indigenous grassroots resistance** predating 1857 Revolt

Buddhu Nonia's Role in Salt Satyagraha

- Responding to **Mahatma Gandhi's call during the Salt Satyagraha (1930)**, Buddhu Nonia engaged in **salt-making as an act of defiance**.
- He was **arrested deceitfully and killed**, becoming a **martyr** in the Indian freedom struggle.

Q. Evaluate the significance of salt-making communities in India's freedom struggle through pre-1857 uprisings and Gandhi's Salt Satyagraha. ***[UPSC MAINS Practice Question]***

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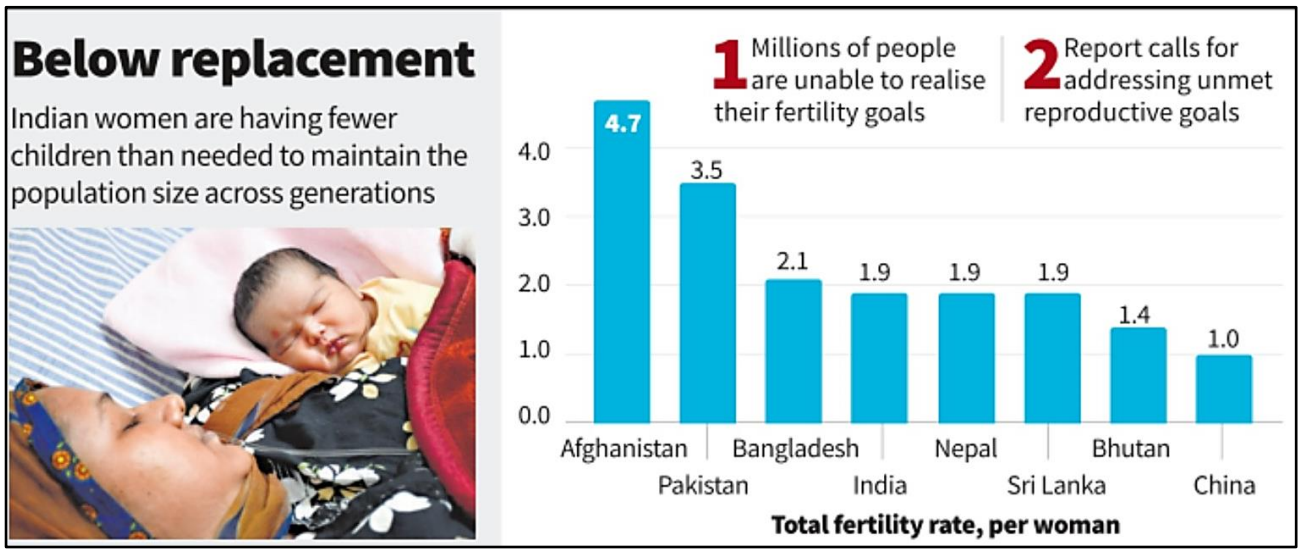
SOCIAL ISSUES

8.1. INDIA'S POPULATION HITS 146.39 CRORE: UNFPA

Why in the News?

The **United Nations Population Fund (UNFPA)** in its latest report titled "State of the World Population 2025" has estimated India's population at 146.39 crore as of April 2025. The report highlights a significant demographic milestone — India's Total Fertility Rate (TFR) has declined to 1.9, falling below the replacement level of 2.1, signalling a major shift in the country's population dynamics.



Key Findings (UNFPA 2025)

- **Falling Fertility**: TFR dropped to **1.9**, below replacement level (2.1), indicating long-term population stabilisation.
- **Population Peak**: Expected to reach **170 crore** in ~40 years before declining.
- **Demographic Dividend**: **68%** in working-age (15–64), **26%** in youth (10–24); a major growth opportunity.
- **Ageing Trend**: **7%** aged 65+, rising with **life expectancy** (71 for men, 74 for women).
- **Fertility Autonomy**: Report stresses **reproductive choice**, not overpopulation, as the key issue.
- **Census Delay**: Census postponed to **March 2027**; last one held in **2011**.

Implications for India

- **Policy Reorientation**: Falling TFR demands policies that **prioritise reproductive health, elder care, and skilling of youth**.
- **Labour Market and Education**: A large working-age population offers **economic potential**, but requires **education reform, job creation, and health infrastructure**.
- **Ageing Challenge**: Growing elderly population implies the need for **pension reforms**, **geriatric care**, and **social security expansion**.
- **Urban Planning**: Slower population growth gives scope for better **infrastructure planning**, **resource management**, and **climate resilience**.

Way Forward: Managing India's Demographic Transition

- **Invest in Health & Reproductive Services:** Ensure **universal access to contraception**, maternal care, and fertility-related counselling to support **reproductive autonomy**.
- **Skilling the Youth:** Launch targeted programmes for **skill development**, digital literacy, and vocational training to harness the **demographic dividend**.
- **Create Quality Employment:** Focus on **labour-intensive sectors**, MSMEs, and green jobs to absorb the large **working-age population**.
- **Strengthen Education Systems:** Improve access to **quality education**, especially for girls and adolescents, to delay early marriages and enhance productivity.
- **Prepare for Ageing Population:** Develop policies for **pensions, elderly healthcare, and age-friendly infrastructure** to address future **geriatric needs**.
- **Speed up Census and Data Systems:** Expedite the **2021 Census** and strengthen demographic data systems to guide **evidence-based policymaking**.
- **Promote Gender Equality:** Enhance **women's participation in the workforce** and decision-making to make growth more inclusive.

India stands at a demographic crossroads — **fertility has fallen, but opportunity remains vast**. The focus now must shift from population control to **population empowerment**. With timely investments in **health, education, and workforce readiness**, India can convert its numbers into a **demographic dividend**, while preparing for an ageing future with equity and resilience.

Q. *"India's demographic transition, marked by a falling fertility rate and a growing working-age population, offers both opportunities and challenges."* In light of the UNFPA's *State of the World Population 2025* report, examine the implications of India's changing population profile and suggest measures to harness its demographic potential while addressing emerging concerns.

[UPSC MAINS Practice Question]

8.2. INDIA'S 2027 CASTE CENSUS

Why in the News?

The Government of India has officially announced that the **16th Census of India** will be conducted in two phases, with reference dates set as March 1, 2027, for most of the country and October 1, 2026, for snow-bound and remote regions such as Ladakh, Jammu & Kashmir, Himachal Pradesh, and Uttarakhand.

Background of the News

- The Census will mark the first nationwide caste enumeration since 1931, making it a historic milestone in India's demographic data collection.
- A Gazette notification under **Section 3 of the Census Act, 1948**, was issued on June 16, initiating house-listing and housing enumeration ahead of the 2027 population count.

Importance of Census in India

Function	Role
Political Representation	Determines **delimitation** of electoral constituencies (Article 82); reservation for SC/ST (Articles 330 & 332).
Resource Allocation	Central grants, subsidies, food rationing based on population data.
Policy Planning	Used by Ministries (e.g., Rural Development, Education) for infrastructure like schools, PHCs.

Legal and Academic Utility	Judiciary and researchers use it for analysing trends in **migration, fertility, employment** etc.
Welfare Targeting	Identifies underserved communities, supports **better governance and service delivery**.

Methodology: How Census is Conducted

- **Two Phases**
- **House-listing and Housing Census** (Expected in 2026):
  Captures housing characteristics like:
  - Head of the household, number of household members.
  - Use of building (residential, commercial, etc.)
  - Construction materials used, number of rooms, ownership status
  - Sources of water and electricity
  - Type of toilet
  - Fuel used for cooking
  - Availability of household assets (e.g., TV, phone, vehicle)
  - **Timeline**: For Census 2027, the exercise is expected in **2026**, with state-wise scheduling flexibility.
- **Population Enumeration** (Feb 2027):
  Collects personal data on:
  - Name, age, sex, date of birth, relationship to the head of household
  - Marital status, education, occupation, religion, caste/tribe, disability status, and migration history.
  - Homeless individuals are also covered.
  - **Timeline: Provisional data** expected within 10 days; **final data** in 6 months.
- **Preparatory Steps**: Prior to starting enumeration, states undertake key actions such as freezing administrative boundaries, carrying out mapping operations, and conducting enumerator training.

Digital Roadmap for India's 2027 Census

- **Key Features**
  - The Census will employ **mobile applications, online self-enumeration**, and **real-time progress monitoring**.
  - This tech-enabled approach replaces the traditional paper-based data collection methods for most users.
- **Self-Enumeration Process**
  - Households will be allowed to log into a government portal or mobile app to fill out Census details themselves.
  - After completion, a unique ID will be generated.
  - Enumerators visiting households will verify details using this unique ID—no redundant data entry required.
- **Field-Level Digital Enumeration**
  - Enumerators will use smartphones or handheld devices loaded with the Census app.
  - Though a **dual mode (digital + paper)** is available, most enumerators will use digital tools due to higher incentives and smartphone ubiquity.

- This system is expected to:
  - Reduce human errors
  - Accelerate data processing
  - Enhance quality assurance

- **Technological Backbone and Monitoring**

Lead Agency	**Registrar General & Census Commissioner of India (RGI)**
Enumerator Training Includes	- Mobile app usage - Geotagging tools - Cloud-based data upload systems
Real-Time Dashboard Functions	- Track progress - Flag inconsistencies - Push technical updates
CMMS (Census Management & Monitoring)	- Real-time supervision - Quick resolution of field-level issues

How Census 2027 Will Differ from Census 2011

Census 2027 introduces both methodological and technological advancements, marking a clear departure from traditional enumeration methods used in the 2011 Census.

- **Transition to Digital-First Approach**
  - Census 2027 will be India's first digital census.
  - Enables online self-enumeration—a first in the country's history.
  - Use of mobile apps and real-time dashboards to collect and monitor data.
- **Advanced Technological Features**

Feature	**Census 2011**	**Census 2027**
Mapping Tools	**Physical maps and area lists**	**GPS tagging and geofencing to avoid coverage gaps**
Error Detection	**No real-time error checks**	**Mobile validation alerts for errors like inconsistent age**
Device Usage	**Entirely paper-based**	**Smartphones and tablets for data entry**

Improved Data Collection & Processing: 2011 vs 2027 Census

Aspect	**Census 2011**	**Census 2027**
Data Entry Method	Manual writing by enumerators	Digital selection via pre-loaded drop-down menus (code directories)
Nature of Responses	Descriptive answers (e.g., spelling-based caste, occupation, language)	Standardised codes assigned for responses— on a mobile app. Standardized codes for things like - Caste/Tribe (SC/ST) - Languages - Occupations - Place of Birth

Processing Time	Slow; took years to release some datasets	Quick digital processing and uniform data
Risk Factors	Prone to spelling errors, bias, and inconsistencies	- Minimised human error and bias due to standardised inputs
Mapping Method	Physical maps and area lists	**GPS tagging** of households and **geofencing** to ensure full coverage
Error Detection	No real-time validation; manual post-checks	Mobile alerts for inconsistencies (e.g., unrealistic age/household size)

Addressing Operational Challenges in Census 2027

- **Digital Literacy & App Usability**
  - **Challenge**: Limited digital literacy among enumerators.
  - **Solutions:**
    - Comprehensive training modules and live simulations.
    - Region-specific language interfaces integrated into the app.
    - Intuitive app design using user-friendly prompts, drop-down menus, and offline sync capabilities for ease of use.
- **Connectivity in Remote Areas**
  - **Challenge:** Poor or no internet access in remote regions.
  - **Solution:**
    - App functionality is enabled offline, ensuring continued data collection.
    - Automatic syncing of data once connectivity is restored.
- **Technical Glitches & System Updates**
  - **Challenge:** Potential for app malfunctions or update failures in the field.
  - **Solutions:**
    - Enumerators equipped with diagnostic tools and technical field support.
    - Provision for real-time troubleshooting to avoid delays in data collection.
- **GPS Tagging & Geolocation Errors**
  - **Challenge:** GPS drift or inaccurate tagging of households.
  - **Solution:**
    - Field supervisors will verify coordinates and manually adjust geotags where discrepancies are detected.
- **Public Hesitation & Access Issues**
  - **Challenge:** Reluctance or fear among respondents to share information.
  - **Solutions:**
    - Enumerators trained in soft skills, community engagement, and awareness of legal provisions.
    - Mobile system includes alerts to log refusals or delays in access for transparency and follow-up.
- **Ensuring Quality Control**
  - **Quality Review Protocols:**
    - Supervisors conduct form reviews based on automatic flagging of anomalies (e.g., duplicate entries, unrealistic age).
    - Periodic checks by Census officers enhance oversight.
    - Real-time data validation enables early correction before final submission.

Q. Critically examine the technological innovations introduced in Census 2027. How do they address the limitations of the 2011 Census and ensure better data integrity?

[UPSC MAINS Practice Question]

8.3. PERFORMANCE GRADING INDEX (PGI) 2.0

Why in the News?

Chandigarh has been ranked as the **best performer** in school education for the academic year 2023–24, according to the Performance Grading Index (PGI) 2.0 report released by the Union Ministry of Education on June 18, 2025. Meghalaya, on the other hand, was placed at the **lowest tier** of the index.

What is PGI 2.0?

- PGI 2.0 serves as a diagnostic tool for evidence-based policymaking by identifying gaps in educational performance, enhancing inter-state benchmarking, and encouraging targeted interventions by state governments and education departments.
- **Genesis**: PGI was introduced in **2017** and revamped as **PGI 2.0 in 2021**.
- PGI 2.0 evaluates **six broad domains**, broken into **70+ indicators**:
  - **Learning Outcomes & Quality**
  - **Access**
  - **Infrastructure & Facilities**
  - **Equity**
  - **Governance Processes**
  - **Teacher Education & Training**
- **Data Sources**:
  - National Achievement Survey (NAS) 2021
  - UDISE+ (Unified District Information System for Education)
  - PM-POSHAN (mid-day meal scheme.
- **Grading Structure**
  - States/UTs are scored **out of 1000 points**, classified into **10 grades**.
  - **No state/UT** has reached the top grade range of **761–1000 (Utkarsh Grade)**.
  - **Scoring Example**: If 50% students in Grade 5 achieved minimum proficiency in Mathematics (weight: 20), the score = 20 × 0.5 = **10**.

Key Rankings and State Performances (2023–24)

Grade Level	Score Range	States/UTs
Prachesta-1	701–760	**Chandigarh** (703) – *only region in this grade*
Prachesta-3	581–640	Punjab (631.1), Delhi (623.7), Gujarat, Kerala, Odisha, Haryana, Goa, Maharashtra, Rajasthan, Dadra Nagar Haveli and Daman Diu, Maharashtra
Akanshi-1	521–580	Puducherry, Himachal Pradesh, Andaman and Nicobar Islands, Tamil Nadu, Karnataka, Lakshadweep, West Bengal, Madhya Pradesh, Sikkim, Uttar Pradesh, Jammu & Kashmir, Uttarakhand, and Ladakh

Akanshi-2	461–520	Bihar (471.9), Mizoram (464.2), Nagaland (468.6), Arunachal Pradesh (461.4), Jharkhand, Assam, Chhattisgarh, Tripura, Manipur, Telangana
Akanshi-3	401–460	**Meghalaya** (417.9) – *lowest scorer and only state in this category*

Year-on-Year Trends

- **25 out of 36 States/UTs** improved their scores in 2023–24 compared to 2022-23.
- The **maximum score** was 719 (Chandigarh), and the **minimum** was 417 (Meghalaya), highlighting **inter-state disparity**.
- In the 2022–23 PGI, Chandigarh emerged as the top performer with a score of 687.8, followed by Punjab (614.1), the Andaman and Nicobar Islands (606.4), and Gujarat (602.2).
- Notably, Chandigarh had also topped the PGI rankings in 2021–22 with a score of 659, ahead of Punjab (647.4) and Delhi (636.2).
- **Twelve states and Union Territories**, including Bihar, Andaman and Nicobar Islands, Chhattisgarh, Jharkhand, and Karnataka — experienced a drop in their PGI 2.0 scores.

Domain-wise Improvements

- **Access Domain (Enrolment, Retention)**
  - **Best Performers**: **Bihar** and **Telangana**
  - **Focus:** Transition to higher grades, inclusion of out-of-school children.
- **Infrastructure Domain**
  - **Assessed:** Working toilets, electricity, computers, internet, libraries, sports/playgrounds.
  - **Top Improvers**: **Delhi**, **Jammu & Kashmir**, **Telangana**

Challenges Highlighted

- **No state/UT in the top four grades** (Daksh, Utkarsh, Atti-Uttam, Uttam)
- **Wide performance disparities** between regions (e.g., Chandigarh vs. Meghalaya).
- Persistent **infrastructure and governance gaps** in many low-scoring states.

Q. Which of the following indicators is NOT directly assessed under the Performance Grading Index (PGI) 2.0? ***[UPSC Pre. Practice Question]***

(a) Learning Outcomes & Quality

(b) Access to Higher Education

(c) Infrastructure & Facilities

(d) Teacher Education & Training

Ans. (b) Access to Higher Education

Q. "The Performance Grading Index 2.0 reflects persistent inter-state disparities in school education outcomes." Discuss how PGI 2.0 helps bridge these gaps and examine the limitations that states must overcome. ***[UPSC MAINS Practice Question]***

8.4. INTEGRATION OF ELECTRIC VEHICLES (EVS) UNDER SWACHH BHARAT MISSION-URBAN (SBM-U)

Why in the News?

In the pursuit of a cleaner and greener India, the integrations of electric vehicles (EVs) into household waste collection marks a transformative step under the Swachh Bharat Mission-Urban (SBM-U).

Key Highlights of Swachh Bharat Mission-Urban

- The integration of EVs into waste collection systems by cities like **Guntur, Chennai, and Indore** signifies a paradigm shift in urban sanitation under SBM–U.
- The move aims to replace **diesel-powered garbage trucks** with **zero-emission electric vehicles**, aligning with SBM–U's **"Garbage-Free Cities"** goal.
- These EVs reduce **carbon emissions, noise, and air pollution**, while improving the **cost-efficiency and reliability** of urban solid waste management.
- The initiative promotes a synergy between **clean mobility**, **digital monitoring**, and **climate action** to enhance:
  - Environmental sustainability
  - Operational efficiency
  - Public engagement
  - Employment generation

SCIAP (2016) – At a Glance

- **Full Form:** Sustainable Cities Integrated Approach Pilot
- **Objective:** Promote sustainable urban planning and management
- **Funded by:** Global Environment Facility (GEF)
- **Executed by:** UNIDO & UN-Habitat
- **Partner Ministry:** Ministry of Housing and Urban Affairs (MoHUA)
- **Pilot Cities:** Bhopal, Guntur, Mysore, Vijayawada, Jaipur

City-wise Initiatives

Guntur (Andhra Pradesh)	Indore (Madhya Pradesh)	Chennai (Tamil Nadu)
- Deployment of 200+ electric autos for door-to-door waste collection. - Supported by **United Nations Industrial Development Organization** (UNIDO) and **Global Environment Facility** (GEF) under **Sustainable Cities Integrated Pilot Approach** (SCIAP) - **GPS-enabled** vehicles for **real-time monitoring**.	- Introduction of 100 electric vehicles for waste collection. - Focuses on core areas like Rajwada. - Vehicles equipped with **real-time GPS tracking**. - Monitored through the **Integrated Command and Control Center (ICCC)**.	- Separate bins for wet, dry, and hazardous waste: promotes source-level segregation. - Audio systems installed in E-rickshaws for public awareness and campaigns.

These innovative models pave the way for other Indian cities to replicate eco-friendly urban waste management strategies, reinforcing India's commitment to climate action and green urban development.

Q. Evaluate the environmental, operational, and socio-economic impacts of using electric vehicles for solid waste management in urban India. How can such innovations be scaled up across other urban local bodies? ***[UPSC MAINS Practice Question]***

8.5. DHARTIAABA JANBHAGIDARI ABHIYAN: EMPOWERING INDIA'S TRIBAL COMMUNITIES

Why in the News?

Recently launched, the **DhartiAaba Janbhagidari Abhiyan** is a nationwide tribal empowerment campaign focused on last-mile delivery of welfare schemes across 100,000+ villages, aligned with PM Modi's Antyodaya vision.

Historical Context

- **Adivasis**, India's tribal communities, are custodians of ancient heritage but have long faced marginalization and limited access to education, healthcare, and economic opportunities.
- **Particularly Vulnerable Tribal Groups (PVTGs)** face deeper challenges due to remote locations, small populations, and socio-economic vulnerabilities.
- Past efforts like the **Tribal Sub-Plan (TSP)** and schemes by the **Ministry of Tribal Affairs** aimed to reduce disparities but often struggled with last-mile delivery and community engagement.
- The **DhartiAaba Janbhagidari Abhiyan** builds on initiatives like **PM-JANMAN** and **DAJGUA**, focusing on a more **inclusive, participatory, and convergence-driven approach** to tribal development.

Government Initiative

DhartiAaba Janbhagidari Abhiyan is a flagship campaign by the **Ministry of Tribal Affairs** aimed at ensuring the comprehensive delivery of government schemes to tribal households. It emphasizes dignity, self-respect, and community ownership in building a *Viksit Bharat* (Developed India).

Key Highlights:

- **Extensive Reach**: Covers 549 tribal-dominated and 207 PVTG-dominated districts, spanning over 100,000 villages and habitations.
- **Benefit Saturation Camps**: Held at the village level to provide key services like Aadhaar updates, Ayushman Bharat cards, Jan Dhan accounts, PM-Kisan enrollments, pensions, scholarships, insurance, skill training, and livelihood support.
- **Community Mobilization**: Local administrations and stakeholders are actively involved in pre-campaign outreach to maximize participation.
- **Convergence Approach**: Integrates efforts across ministries and local bodies to ensure efficient, last-mile delivery without duplication.
- **People-Centric Model**: Promotes *Janbhagidari* (people's participation) in governance, aligned with PM-JANMAN and DAJGUA initiatives.

Way Forward

To ensure the long-term success of the DhartiAaba Janbhagidari Abhiyan, several steps can be taken:

- **Sustained Monitoring and Evaluation**: Establish robust mechanisms to track the campaign's progress, ensuring that benefits reach all intended beneficiaries and addressing any implementation gaps promptly.
- **Capacity Building**: Strengthen the capacity of local administrations and community leaders to sustain the momentum of the campaign beyond the initial phase.
- **Cultural Preservation**: Integrate efforts to preserve and promote tribal culture, languages, and traditional knowledge systems alongside economic and social empowerment.
- **Technology Integration**: Leverage digital tools, such as mobile apps and data analytics, to enhance transparency, monitor enrollments, and ensure real-time feedback from beneficiaries.
- **Focus on PVTGs**: Prioritize the unique needs of PVTGs by tailoring interventions to their specific socio-economic and geographical challenges.
- **Public-Private Partnerships**: Collaborate with NGOs, private organizations, and civil society to augment resources and expertise for skill development and livelihood programs.

The DhartiAaba Janbhagidari Abhiyan is a landmark step toward inclusive development, combining large-scale outreach with a participatory, community-led approach. By delivering essential services and honoring tribal heritage, it sets a model for convergence-based governance and empowers tribal communities as key partners in building a *Viksit Bharat*.

Q. Analyze the significance of the DhartiAaba Janbhagidari Abhiyan in the context of inclusive governance and tribal empowerment in India. Discuss the challenges in its implementation and suggest measures to ensure its long-term success. ***[UPSC MAINS Practice Question]***

8.6. MAHARASHTRA DECLARES HINDI AS DEFAULT THIRD LANGUAGE IN SCHOOLS

Why in the News?

The Maharashtra government has released a **revised Government Resolution (GR)** mandating the inclusion of Hindi as the third language for students in **Classes 1 to 5** in all Marathi and English medium schools across the state.

Hindi As The Third Language

- The Maharashtra School Education Department, as part of implementing the ***State Curriculum Framework for School Education 2024*** aligned with the *National Education Policy (NEP) 2020*, issued a revised Government Resolution (GR) on 17 June, 2025.
- **As per the Revised Government Resolution (GR):**
  - **Hindi will "generally" be taught as the third language** in Marathi and English medium schools from Classes 1 to 5.
  - **However, it is not mandatory** — students have the option to choose another Indian language.
  - If a **minimum of 20 students** per grade in a school opt for an Indian language other than Hindi, a teacher for that particular language will be made available or the language will be taught online.
  - The directive also mandates that in schools with mediums of instruction other than Marathi or English, the three-language formula must include the medium of instruction, Marathi, and English.

Three Language Formula

- **Historical Background**: First introduced in the **National Education Policy (NEP) of 1968**, following the recommendations of the **Kothari Commission (1964-66).** It proposed the inclusion of the mother tongue or regional language, the official language, and a modern Indian or foreign language in the curriculum.
- **NEP 2020 Update:** Reaffirms the three-language formula while emphasizing flexibility—at least two of the three languages should be native to India. The policy avoids imposing any particular language and considers the preferences of states, regions, and students.
- **Medium of Instruction**: Recommends that, where possible, the medium of teaching be the home language, mother tongue, or regional/local language until at least Grade 5—and preferably till Grade 8 or beyond.

Rationale for the Three-Language Policy

- **Constitutional Backing**: The policy aligns with **Article 350A**, which calls on states to provide instruction in the mother tongue at the primary level, especially for linguistic minorities. **Article 351** further encourages the promotion and development of the Hindi language.
- **Cultural and Educational Value**: Encourages multilingualism and multicultural integration, contributing to national unity while also offering cognitive benefits for children exposed to diverse languages early on.

Barriers to Effective Implementation

- **Political Sensitivities**: Language policies often trigger regional identity concerns, as seen in protests in Maharashtra and Karnataka that view multilingual mandates as a threat to local linguistic identities.

- **Voluntarism vs. Mandate**: Language learning should stem from choice rather than compulsion, to ensure inclusivity and acceptance.
- **Curricular Load**: The inclusion of three languages at the primary level may overburden students, especially in systems already struggling with foundational literacy and numeracy.
- **Operational Difficulties**: Implementing this policy in linguistically heterogeneous regions like Nagaland or among tribal populations poses challenges, especially where state capacity and teacher availability are limited.

Q. How does the NEP 2020's flexibility in language choice address the challenges of implementing multilingual education in India? ***[UPSC MAINS Practice Question]***

8.7. NEWS IN SHORTS

8.7.1. RECOUNTING VELPUR'S STORY IN ENDING CHILD LABOUR

Why in the News?

June 12 is observed as **World Day Against Child Labor**, drawing attention to the 160 million children still trapped in labor worldwide. The day highlights global efforts for eradication and celebrates successful models like **Velpur Mandal** in India.

Global and National Context

Child labor is most prevalent in **Africa, Asia, and the Pacific**, with **1 in 10 children** affected globally. In India, **43.53 lakh children (ages 5–14)** were engaged in labor (2011 Census), particularly in industries like **beedi-making, carpet weaving**, and **fireworks**, driven by **poverty and lack of education**.

Velpur Mandal: A Success Story

In **2001**, Velpur in Telangana became a **child labor-free zone within 100 days** through a community-driven campaign. Despite initial resistance and misinformation, awareness efforts, **employer cooperation**, and **₹35 lakh in debt forgiveness** enabled children to attend school.

Institutional Support

Village heads signed MoUs committing to full enrolment. Boards declaring "No child labor in our village" symbolize continued vigilance.

Wider Impact

Recognized by the **ILO**, **NHRC**, and **President A.P.J. Abdul Kalam**, the model is now used in **training programs** across India.

Velpur proves that **grassroots action, leadership, and education** can eliminate child labor—offering a powerful model for global replication.

Q. "Grassroots action and community participation are critical to eliminating child labour in India." Discuss this statement with reference to the success story of Velpur Mandal and the challenges in combating child labour nationwide. ***[UPSC MAINS Practice Question]***

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GOVERNMENT SCHEMES & INITIATIVES

9.1. PM INTERNSHIP SCHEME

Why in the news?

The Prime Minister Internship Scheme, recently promoted by Union Minister Nirmala Sitharaman with the launch of a mobile app, is a key initiative by the Indian government to offer valuable internship opportunities for young people.

The scheme is primarily aimed at individuals aged 21 to 24 from economically disadvantaged backgrounds, offering them one-year internships across the country's top 500 companies.

These internships cover 24 industries, including sectors like oil, gas, energy, tourism, hospitality, automotive, banking, and finance.

Eligibility Criteria include:

- Completion of 10th, 12th, ITI, Polytechnic, or Diploma courses.
- Recent graduates from non-premier educational institutions.
- Applicants from families with an annual income of Rs. 8 lakh or less.
- Applicants whose families have no government job holders.

To ensure inclusivity and provide opportunities to those from underrepresented communities, the program excludes students from top-tier institutions like IITs, IIMs, National Law Universities, and individuals with professional degrees (e.g., CA, MBA, MBBS).

This initiative is a part of a broader effort to enhance skill development and employment opportunities, aiming to bridge the gap between academic knowledge and practical work experience.

Q. With reference to the eligibility criteria for the Prime Minister Internship Scheme, consider the following statements:

1. Candidates who have completed 10th, 12th, ITI, Polytechnic, or Diploma courses are eligible to apply.
2. Applicants from families with an annual income above ₹8 lakh are eligible under the scheme.
3. Students from premier institutions such as IITs, IIMs, and National Law Universities are eligible to apply.

Which of the statements given above is/are correct? ***[UPSC Pre. Practice Question]***

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

Ans. (a) 1 only

9.2. NEWS IS SHORTS

9.2.1. PRADHAN MANTRI SHRAM YOGI MAANDHAN (PM-SYM) SCHEME

Why in the News?

Recently, the Pradhan Mantri Shram Yogi Maandhan (PM-SYM) Scheme completed 6 years; the scheme was launched in 2019.

Scheme Overview

- The PM-SYM Scheme offers universal pension coverage, ensuring financial security for unorganized workers and fostering a more inclusive social security system in India.

- The unorganized sector contributes approximately 50% of the nation's GDP, with over 30.51 crore workers registered on the e-Shram portal as of 2024.
- Upon reaching the age of 60, eligible beneficiaries receive a pension of ₹3,000 per month. In case the beneficiary passes away after retirement, the spouse is entitled to 50% of the pension. If the beneficiary dies before the age of 60, the spouse has the option to either continue or exit the scheme.

Objective: To provide pension security to unorganized sector workers, who form nearly 50% of India's GDP, in occupations such as street vending, construction, agriculture, and domestic work.

Eligibility:

- **Age**: 18–40 years
- **Monthly Income**: ₹15,000 or less
- **Exclusions**: Not covered under EPF, ESIC, or NPS.

Contribution and **Enrollment**:

The monthly contribution to the Pradhan Mantri Shram Yogi Maandhan (PM-SYM) Scheme ranges from ₹55 to ₹200, depending on the age at the time of joining. Enrollment can be done through Common Service Centers (CSC) or the Maandhan portal.

Implementation:

- Managed by the Ministry of Labour & Employment and Life Insurance Corporation of India (LIC).
- As of March 2025, 46.12 lakh enrollments across 36 States/UTs, with Haryana, Uttar Pradesh, and Maharashtra leading in registrations.

Q. Discuss the objectives, eligibility criteria, and implementation challenges of the Pradhan Mantri Shram Yogi Maandhan (PM-SYM) Scheme. Suggest measures to improve its outreach and sustainability. ***[UPSC MAINS Practice Question]***

9.2.2. LAKHPATI DIDI SCHEME

Why in the News?

On International Women's Day, PM Modi recently emphasized the significance of the Lakhpati Didi Scheme and its achievement.

Lakhpati Didi Scheme

It was launched in 2023 by the Ministry of Rural Development and aims to empower rural women by providing training and resources for sustainable income.

Key Features:

- The scheme focuses on training women in SHGs to achieve a sustainable annual income of at least Rs 1 lakh per household.
- It aims to equip women with skills and provide opportunities to generate income through various livelihood activities.
- The government intends to train 3 crore women, positioning them as influencers within their homes and communities, shifting the focus towards entrepreneurial success.
- It ensures a holistic approach by integrating efforts from government departments, private sector, and market players to create diversified livelihood opportunities.

Achievements of the Lakhpati Didi Scheme:

- **Empowered 3 crore women:** The scheme successfully trained millions of women in rural areas, helping them gain financial independence.
- **Boosted sustainable income:** Women in Self-Help Groups (SHGs) were able to achieve a sustainable income of at least Rs 1 lakh per annum per household.
- **Expanded livelihood options:** Facilitated diverse livelihood activities, offering women access to skills training and income-generating opportunities.
- **Introduced Drone Didi:** Approximately 15,000 women SHGs were provided drones to support precision farming, improving agricultural productivity and monitoring.
- **Skills development:** Women were trained in a wide range of skills, such as LED bulb making, plumbing, and other trades, broadening their employment prospects.

- **Converged government and private sector support:** The scheme successfully integrated resources from multiple sectors, including government departments, private companies, and market players, to ensure comprehensive livelihood support.
- **Promoted entrepreneurship:** Shifted the focus of social inclusion towards entrepreneurial success, empowering women as influencers in their homes and communities.

Q. Consider the following statements regarding the Lakhpati Didi Scheme:

1. The Lakhpati Didi Scheme was launched in 2023 by the Ministry of Rural Development to empower rural women by providing training for sustainable income generation.
2. The scheme aims to train 3 crore women and help them achieve an annual income of at least Rs 1 lakh per household through various livelihood activities.
3. One of the key features of the scheme is the provision of drones to approximately 15,000 women SHGs to support precision farming and improve agricultural productivity.
4. The scheme exclusively relies on government funding, without involving any private sector support.

Which of the statements given above is/are correct? ***[UPSC Pre. Practice Question]***

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

Ans. (a) 1, 2, and 3 only

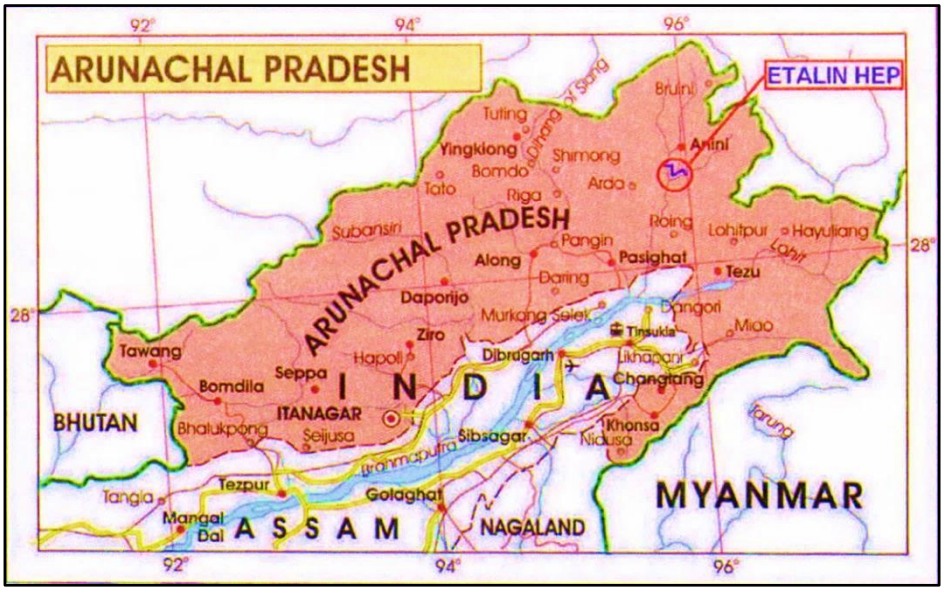
*****

PLACES IN NEWS

10.1. THE ETALIN HYDEL PROJECT

Why in the News?

The Environment Ministry's Forest Advisory Committee (FAC) has granted in-principle forest clearance to the 3,097-MW Etalin hydel project.



About Etalin Project

- **Capacity**: 3,097 MW run-of-the-river project.
- **Location**: Dibang Valley, Arunachal Pradesh, on Dri and Tangon rivers.
- **Forest Impact**: ~1,175 hectares of forest to be diverted; over 2.7 lakh trees to be felled.
- **Biodiversity Risk**: Located in a biodiversity hotspot; habitat for species like red panda, clouded leopard, and king cobra.
- **Tribal Concerns**: Affects Idu Mishmi tribal communities dependent on forest and river ecosystems.
- **Developer**: Joint venture of **Jindal Power** and **Hydropower Development Corporation of Arunachal Pradesh**; now under **SJVN Ltd**.
- **Clearance Conditions**: Approval linked to a ₹29.5 crore biodiversity management plan and restoration of temporary land use.

The Etalin project represents a critical test of balancing India's renewable energy goals with ecological preservation and indigenous rights. Moving forward, development must be pursued with transparency, scientific rigour, and deep sensitivity to local communities and biodiversity.

Q. The Etalin Hydel Project, recently in news, is located in which of the following states?

[UPSC Pre. Practice Question]

(a) Sikkim
(b) Arunachal Pradesh
(c) Himachal Pradesh
(d) Uttarakhand

Ans. (b) Arunachal Pradesh

10.2. NEWS IN SHORTS

10.2.1. ERUPTION OF MOUNT ETNA IN SICILY

Why in the News?

The recent eruption of **Mount Etna** in Sicily, Italy, has once again drawn global attention to the powerful and unpredictable nature of volcanic activity. As Europe's most active volcano, Etna's eruption serves as a reminder of the dynamic geological processes shaping our planet.

What is a Volcanic Eruption?

A volcanic eruption is the release of **molten rock (lava)**, **gases**, and **rock fragments** from within the Earth through surface vents, often triggered by rising magma and built-up pressure.

How Magma Forms and Moves?

- Deep underground, high temperature and pressure melt mantle rock to form **magma**.
- Being less dense, magma rises through the crust, accumulating in **magma chambers**.

Gas Pressure and Eruption Mechanism:

- Magma contains volatile gases (H_2O, CO_2, SO_2).
- As it nears the surface, pressure drops and gases expand, creating **bubbles**.
- If pressure becomes extreme, magma **erupts violently**, releasing lava, ash, and gases.

Where Do Eruptions Occur?

- **Tectonic plate boundaries**
- **Hotspots** or **mantle plumes**

Types of Volcanoes:

- **Stratovolcanoes:** Steep, explosive (e.g., Mt. Etna, Fuji)
- **Shield Volcanoes:** Wide, gentle slopes, fluid lava (e.g., Mauna Loa)
- **Cinder Cones:** Small, steep, single eruptions
- **Calderas:** Large craters from major eruptions (e.g., Yellowstone)
- **Lava Domes:** Formed by viscous, slow-moving lava

Impact of Volcanic Eruptions

Positive Effects:	**Negative Effects:**
• Enriches soil with **nutrient-rich ash** • Supports **geothermal energy** development • Creates new **landforms and islands**	• Destroys life and infrastructure • Disrupts **climate and weather patterns** (e.g., from sulfur aerosols) • Interrupts **air travel and communication networks**

Mount Etna's latest eruption is a powerful reminder of the Earth's ever-changing nature. While volcanic activity poses serious risks, it also plays a crucial role in shaping our environment and offering resources. Understanding these processes is essential for preparedness and harnessing their benefits responsibly.

Q. *"Volcanic activity, though destructive in nature, plays a significant role in shaping Earth's physical and ecological landscape."* Discuss with reference to the recent eruption of Mount Etna and explain the geophysical processes behind volcanic eruptions.

[UPSC MAINS Practice Question]

10.2.2. CHENAB RAILWAY BRIDGE

Why in the News?

The Prime Minister of India will inaugurate the Chenab Railway Bridge, marking the completion of the Udhampur–Srinagar–Baramulla Rail Link (USBRL) project. It stands as **the world's tallest railway bridge** and a testament to India's engineering capabilities.

About the Bridge:

- **Location:** Spans the Chenab River between Bakkal and Kauri villages in Reasi district, J&K.
- **Height:** 359 meters – 35 meters taller than the Eiffel Tower.
- **Built By:** Konkan Railway; executed by Afcons (India), Ultra Construction (South Korea), and VSL India.
- **Length:** 1,315 meters
- **Speed & Lifespan:** Trains can run at 100 km/h; designed lifespan of 120 years.
- **Resilience:** Earthquake (up to magnitude 8), wind (266 km/h), and blast-resistant (40 tonnes TNT).

Strategic and National Significance:

- **Connectivity to Kashmir:** Ensures seamless rail access to the Kashmir Valley, reducing dependency on roadways prone to weather disruptions.
- **National Integration:** Strengthens integration of the sensitive border region with the Indian heartland.
- **Engineering Feat:** Constructed in seismic zone V and across fractured Himalayan geology, it represents a pinnacle of design, safety, and precision.
- **Economic Upliftment:** Expected to boost tourism, trade, and employment in Jammu & Kashmir.
- **Security Importance:** Enhances military logistics and rapid troop movement in a strategically sensitive region.

A Symbol of New India:

The Chenab Railway Bridge exemplifies the vision of a connected, resilient, and forward-looking India. It reflects not just infrastructure development, but the integration of engineering excellence with national strategy.

Q. "The Chenab Railway Bridge represents not only an engineering marvel but also a strategic asset." Examine the implications of the bridge in the context of regional development, national security, and infrastructure advancement in India. ***[UPSC MAINS Practice Question]***

10.2.3. NEW ZEALAND SUSPENDS FUNDING TO COOK ISLANDS

Why in the news?

New Zealand suspended NZ$18.2 million in funding to the Cook Islands over its growing ties with China, following unconsulted strategic agreements signed in February.

Cook Islands

- **Geographical Overview**:
  - Consists of 15 islands spread over 2 million sqkm. in the South Pacific Ocean.
  - Located in the Polynesian Triangle, approximately halfway between Hawaii and New Zealand.

- Positioned east of Niue, Tonga, and Samoa; northeast of New Zealand; south of Kiribati; and west of French Polynesia.

- **Island Groups**:
  - **Northern Group**: Six low-lying coral atolls (Manihiki, Nassau, Penrhyn, Pukapuka, Rakahanga, Suwarrow), sparsely populated with light vegetation and white sand beaches.
  - **Southern Group**: Nine larger, volcanic islands (Rarotonga, Aitutaki, Atiu, Mangaia, Manuae, Mauke, Mitiaro, Palmerston, Takutea), densely populated.

- **Key Features**:
  - **Highest point:** Te Manga on Rarotonga.
  - **Capital:** Avarua, located on Rarotonga, the most populous island.
  - Named after Captain James Cook, who explored the islands in 1773.

- **Governance and Economy**:
  - Self-governing island country in free association with New Zealand since August 1965.
  - Cook Islanders hold New Zealand citizenship with free access to New Zealand and Australia.
  - **System of government:** Parliamentary democracy under a constitutional monarchy.

Q. Where are the Cook Islands located? ***[UPSC Pre. Practice Question]***

(a) In the Caribbean Sea, near Cuba

(b) In the South Pacific Ocean, within the Polynesian Triangle

(c) In the Indian Ocean, near the Maldives

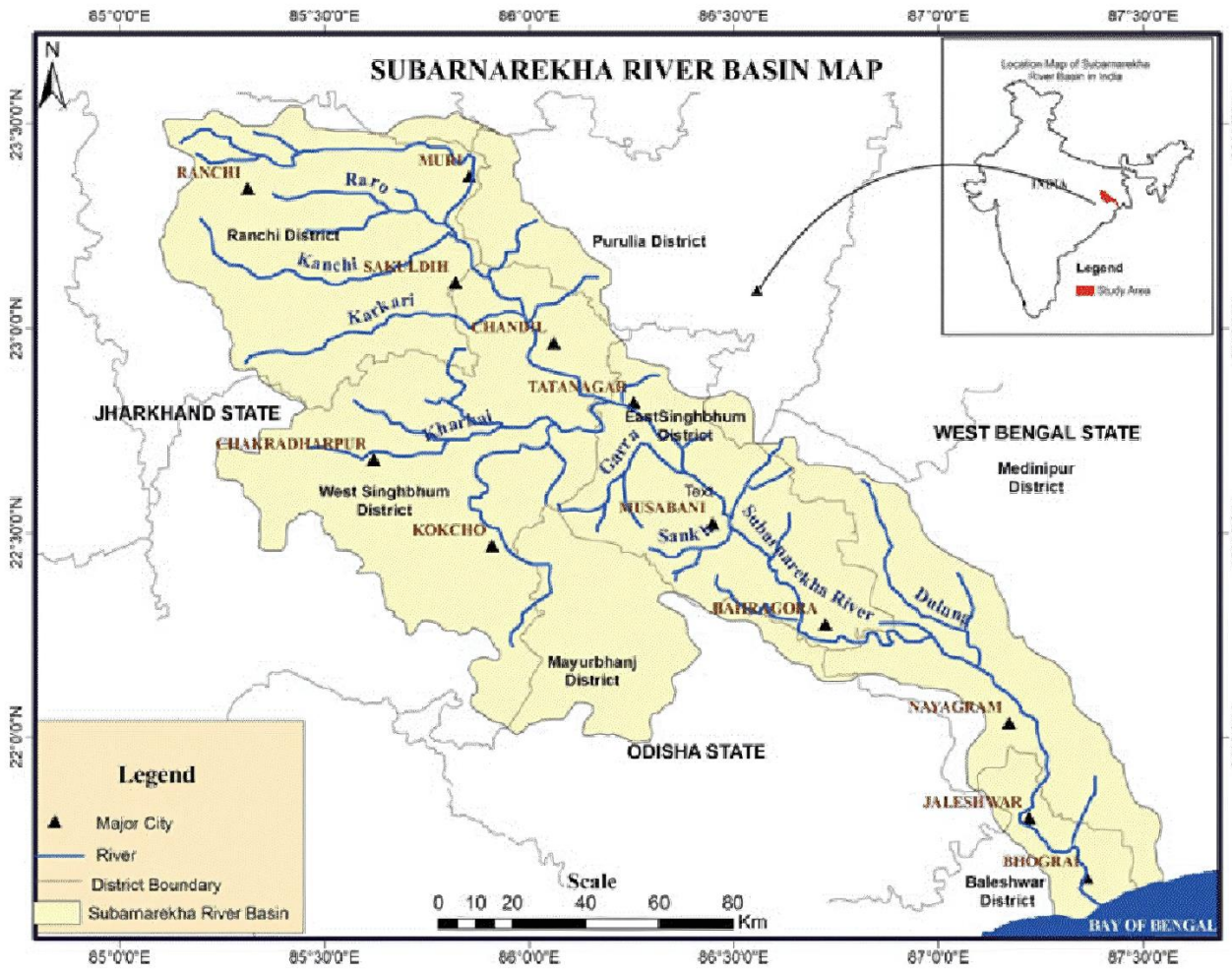
(d) In the North Atlantic Ocean, near Iceland

Ans. (b) In the South Pacific Ocean, within the Polynesian Triangle

10.2.4. ODISHA FLASH FLOOD IN SUBARNAREKHA RIVER

Why in the News?

Recently, the Subarnarekha River caused significant flooding in Odisha's Balasore district, affecting over 50,000 residents. Flash floods led to water entering hundreds of villages, damaging homes, farmlands, and road infrastructure. The situation prompted a large-scale evacuation and disaster relief response by the state and central agencies.



About Subarnarekha River

- **Origin and Course:** The Subarnarekha River originates near **Nagri village** in **Ranchi district** of **Jharkhand** at an altitude of around **600 meters**. From there, it flows eastward, traversing through the states of Jharkhand, Odisha, and West Bengal before draining into the **Bay of Bengal**.
- **Etymology:** The name **Subarnarekha** translates to "**Streak of Gold**", owing to traces of gold historically found in its sands, especially in the upper reaches.

Key Features of the River

- **Region**: Primarily flows through the **Chota Nagpur Plateau** and passes through mineral-rich areas, including copper mining zones.
- **Waterfall**: Descends the plateau via the notable **Hundrugbagh Waterfall**.
- **Tributaries**:
  - **Right-bank tributaries**: *Kanchi*, *Karkari*, and *Kharkai* Rivers.
- **Climatic Influence**: The basin is majorly influenced by the **Southwest Monsoon**, active from **June to October**.

River Basin

- **Geographical Spread**: Covers parts of **Jharkhand**, **Odisha**, and a small section of **West Bengal**.
- **Boundaries**:
  - North & West: **Chota Nagpur Plateau**
  - South: Ridges separating from the **Baitarani basin**
  - East: **Kasai Valley** of the **Kangsabati River**

- South-East: **Bay of Bengal**

Other Major Rivers in Odisha

River Name	Origin Location	Drains Into	Key Characteristics
Subarnarekha	Nagri, Ranchi (Jharkhand)	Bay of Bengal	Monsoon-fed; flows through copper-rich regions; flash flood-prone
Baitarani	Guptaganga Hills (Keonjhar)	Bay of Bengal	Important for agriculture; frequent flooding during monsoon
Budhabalanga	Similipal Hills (Mayurbhanj)	Bay of Bengal	Originates in forested area; flash flood-prone
Rushikulya	Daringbadi hills (Kandhamal)	Bay of Bengal	Does not form a delta; ecologically significant
Brahmani	Confluence of Sankh and South Koel	Bay of Bengal	Supports heavy industry and irrigation; second longest in Odisha
Mahanadi	Raipur district (Chhattisgarh)	Bay of Bengal	Major river; Hirakud Dam built on it; lifeline of Odisha

The Subarnarekha River, though lesser-known than the Mahanadi or Brahmani, holds immense geographical, ecological, and strategic importance for eastern India. The recent floods underscore the pressing need for sustainable river basin management and resilient infrastructure in monsoon-affected regions.

Q. Which of the following rivers are east-flowing rivers in India?

1. Mahanadi
2. Subarnarekha
3. Narmada
4. Godavari

Select the correct answer using the code below: ***[UPSC Pre. Practice Question]***

(a) 1, 2, and 4 only (b) 1, 3, and 4 only

(c) 2 and 3 only (d) 1, 2, 3, and 4

Ans. (a) 1, 2, and 4 only

10.2.5. MOUNT DENALI: NORTH AMERICA'S TOWERING GIANT

Why in the News?

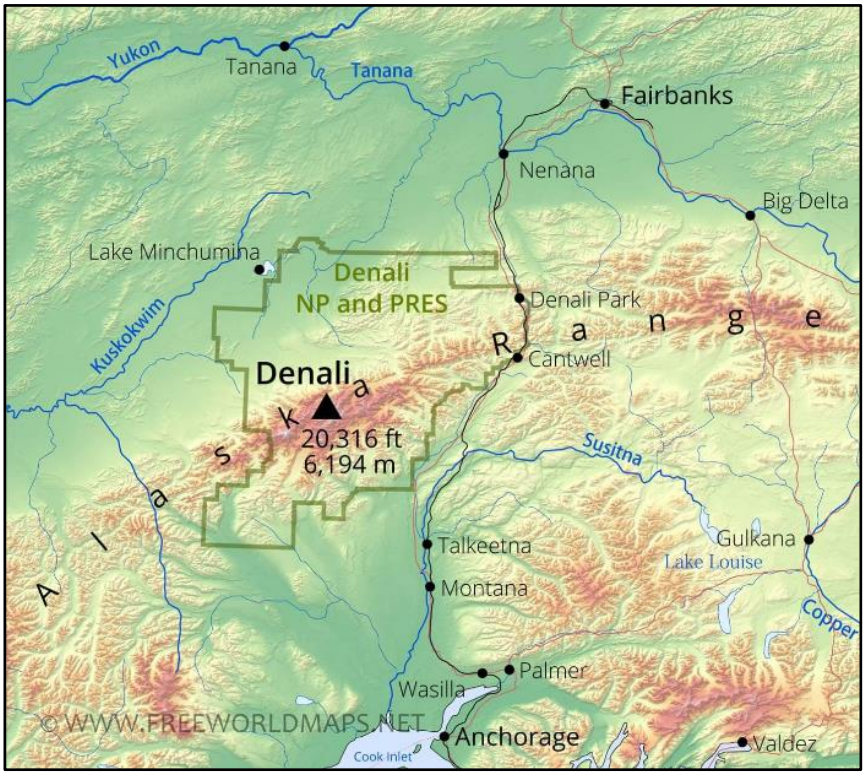
A team of mountaineers from Kerala found themselves stranded on Mount Denali while attempting a high-altitude expedition aimed at unfurling a banner in tribute to the Indian armed forces under **Operation Sindoor**.

Location

Mount Denali, also known as **Mount McKinley**, is the tallest mountain in **North America**, reaching an elevation of **6,190 meters**. Located in **Alaska**, it is the crown jewel of the **Alaska Range** and lies within the **Denali National Park and Preserve**.

Geological Significance

Denali was formed through intense **tectonic activity** approximately **60 million years ago**, resulting from the subduction of the **Wrangellia Composite Terrane** (an oceanic plate) beneath the **North American Plate**. The mountain is primarily composed of granite and has undergone significant uplift due to continued geological forces.



Topographical Features

- **Twin Summits**: Denali consists of two prominent peaks, with the **southern summit** being the highest.
- **Glaciers**: Its snow-covered upper slopes feed several major glaciers, including **Kahiltna**, **Muldrow**, **Peters**, **Ruth**, and **Traleika**.
- **Extreme Climate**: The mountain is infamous for its unpredictable weather, steep vertical elevation gain, and dangerously low temperatures—posing serious challenges for climbers.

Global Mountaineering

Denali ranks as the **third-highest** among the **Seven Summits**—the tallest peaks across each continent—following Mount Everest (Asia) and Aconcagua (South America).

Historical Naming

Although widely referred to as **Mount McKinley** in the past, the name **Denali** was officially restored in **2015** to reflect the terminology used by the indigenous **Koyukon Athabaskan** people. However, in **2025**, the name **Mount McKinley** was reinstated by the U.S. President, reviving the earlier nomenclature.

Q. Consider the following pairs:

Mountain	**Country**
A. Mount McKinley	1. Nepal
B. Mount Aconcagua	2. United States
C. Mount Elbrus	3. Argentina
D. Mount Everest	4. Russia

Choose the correct option: ***[UPSC Pre. Practice Question]***

(a) A-2, B-3, C-4, D-1 (b) A-3, B-1, C-2, D-4

(c) A-1, B-2, C-3, D-4 (d) A-4, B-2, C-1, D-3

Ans. (a) A-2, B-3, C-4, D-1

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MISCELLANEOUS

11.1. MAGNA CARTA: THE 800-YEAR-OLD FOUNDATION OF MODERN DEMOCRACY

Why in the News?

The Magna Carta was signed on **June 15, 1215**, at **Runnymede Meadows** near London, but it was revoked only a few weeks later. Much of its content dealt with matters of local governance and administration.

Background of the News

- June 15, 2025, marked the **810th anniversary** of the signing of the *Magna Carta* (Latin for "Great Charter"), originally sealed on **June 15, 1215**, at **Runnymede Meadows near London**.
- Harvard University recently discovered a **1300 version** of the Magna Carta in its collection, emphasizing its long-lasting historical importance.

Historical Context

- The Magna Carta was drafted during a time of severe unrest in England under King John, who faced military failures and increased taxation pressure on barons and commoners.
- Barons rebelled following the defeat at the Battle of Bouvines (1214), demanding legal restrictions on the king's power.
- To avoid civil war, King John agreed to the charter under duress, though he soon sought to annul it with Papal support.

Core Provisions of the 1215 Magna Carta

- Composed of 63 clauses, many of which focused on feudal rights and local governance.
- **Clause 39:** "No free man shall be seized or imprisoned… except by the lawful judgment of his equals or by the law of the land."
- **Clause 40:** "To no one will we sell, to no one will we deny or delay, right or justice."
- These clauses became the foundation of due process and legal equality in common law traditions.

Political Fallout and Re-issuance

- Within 3 months, King John sought annulment; civil war followed.
- After John's death in 1216, his son Henry III was crowned and reissued a modified Magna Carta to regain baronial support.
- Multiple versions were issued throughout the 13th century. The 1297 version is a statute in UK law even today.

Long-Term Significance-Lasting Symbolism

- Though originally focused on elite rights, the Magna Carta evolved into a **symbol of constitutionalism and liberty.**
- Inspired concepts such as:
  - **Rule of Law:** This principle restricted arbitrary authority and required that all actions, even by monarchs, be legally justified.
  - **Habeas Corpus:** Guarding against arbitrary detention
- In the American Revolution, colonists cited Magna Carta to demand equal rights, which influenced the US Constitution and Bill of Rights.

Critiques and Limitations

- Applied only to "free men" — excluding serfs, most women, and peasants.
- Its democratic interpretation is retrospective, as its original goal was to negotiate power between monarchy and nobility, not democratize governance.

Present-Day Relevance

- Seen as a blueprint for democratic values like equal protection under law and justice delivery without delay.
- Clauses 39 and 40 remain part of British statute and influence global human rights law.

Q. Despite its limitations and context-specific origins, Magna Carta is celebrated as a global symbol of liberty and rule of law. Analyze this paradox in light of its historical scope and legacy.

[UPSC MAINS Practice Question]

11.2. NEWS IN SHORTS

11.2.1. LANDSLIDE HITS ARMY STATION IN SIKKIM

Why in the News?

Recently, a devastating landslide, triggered by intense and continuous rainfall, struck a military camp in the **Lachen district of Sikkim**, leading to casualties and significant property damage.

What is a Landslide?

landslide, the movement downslope of a mass of rock, debris, or soil (soil being a mixture of earth and debris). Landslides occur when gravitational and other types of shear stresses within a slope exceed the shear strength (resistance to shearing) of the materials that form the slope.

Causes of Landslides

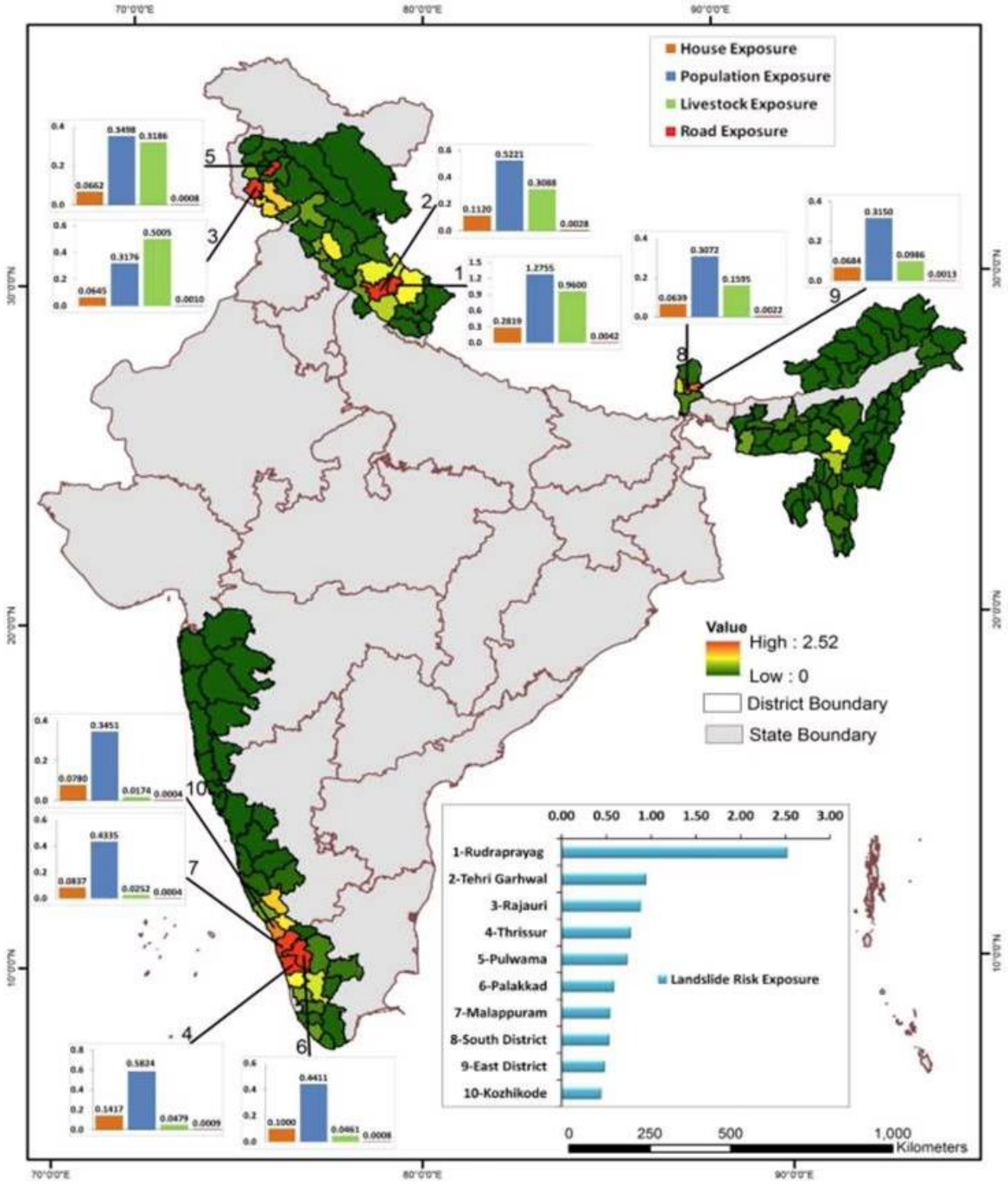
Natural Causes	Anthropogenic Causes
• **Heavy Rainfall:** Saturates soil, increasing pore water pressure and reducing slope stability. • **Erosion:** Removal of cohesive elements like clay and vegetation weakens the binding of soil particles. • **Earthquakes:** Ground shaking destabilizes rocks and soil, often leading to sudden slope failure. • **Volcanic Eruptions:** Ash and debris overload slopes while seismic activity contributes to instability.	• **Deforestation:** Vegetation plays a key role in stabilizing soil. Its removal increases the risk of slope failure. • **Encroachment on Vulnerable Terrain:** Unregulated construction in hilly regions increases stress on unstable slopes. • **Uncontrolled Excavation:** Poorly planned activities such as mining and quarrying undermine slope integrity.

Landslide Vulnerability in India

India is among the **top five most landslide-prone countries** in the world, primarily due to its tectonic activity and diverse topography. The **northward movement of the Indian Plate** at about 5 cm per year generates significant geological stress, contributing to frequent landslides.

According to the **Landslide Atlas of India** by ISRO:

- About **12.6%** of India's land area is vulnerable to landslides (excluding snow-covered areas).
- Of this, **66.5%** lies in the **North-Western Himalayas**, **18.8%** in the **North-Eastern Himalayas**, and **14.7%** in the **Western Ghats**.



Measures Taken by India

Legal and Policy Framework	Institutional Support	Technology and Early Warning
• **Disaster Management Act, 2005**: Provides the legal and institutional framework for managing disasters, including landslides. • **National Landslide Risk Management Strategy (2019)**: Covers hazard mapping, risk assessment, early warning systems, and capacity building. • **NDMA Guidelines (2009)**: Offer specific protocols for landslide hazard management.	• **National Institute of Disaster Management (NIDM):** Offers training, research, and support to disaster authorities. • **Landslide Hazard Zonation Maps (LHZM):** Developed by the **Geological Survey of India (GSI)** and **National Remote Sensing Centre (NRSC)** to guide safe land use planning.	• **Ensemble Prediction System**: Enhances weather forecasting to predict rainfall-related hazards like landslides. • Use of **GIS, LiDAR**, and **remote sensing** tools to map and monitor vulnerable zones.

Way Forward

- **Regular Update of Hazard Zonation Maps**: Using modern tools such as drones, LiDAR, and GIS for accurate and timely mapping.
- **Reforestation and Slope Stabilization**: Promote afforestation using native species and adopt bioengineering techniques to strengthen slopes.
- **Climate-Adaptive Infrastructure**: Build resilient infrastructure and upgrade drainage systems to adapt to increasing rainfall events due to climate change.
- **Community Awareness and Preparedness**: Conduct awareness drives and training programs in vulnerable regions to enhance community resilience.

India's vulnerability to landslides, especially in ecologically sensitive and strategic regions like Sikkim, highlights the need for integrated disaster risk management, combining technology, regulation, and community involvement.

Q. With climate change intensifying extreme weather events, landslides are becoming more frequent and deadly in ecologically fragile regions like the Himalayas. Discuss the need for climate-adaptive infrastructure and community-based disaster risk reduction strategies.

[UPSC MAINS Practice Question]

11.2.2. SAFETY ISSUES IN INDIA'S AVIATION SECTOR

Why in the News?

The **crash of Air India Flight AI171**, shortly after takeoff from Ahmedabad on has raised serious safety concerns.

Key Aviation Safety Issues in India

- **Aircraft Technical Faults:** Past issues with Dreamliners include battery fires, engine icing, and flight deck glitches.
- **Operational Lapses:** Suspected flaws in **load planning**, **temperature handling**, and **wing settings** during takeoff.
- **Bird Strike Risks:** Inadequate wildlife hazard management near key airports.

- **Regulatory Shortcomings:** DGCA often acts reactively; lacks deep audit capabilities for widebody and long-haul operations.
- **Merger Transition Risks:** Air India's mega-merger may cause temporary disruptions in **safety SOPs**, crew standardisation, and training.
- **Aging Fleet and MRO Gaps:** Several aircraft over a decade old; predictive maintenance is underutilised.
- **Stressed Airport Infrastructure:** Congested terminals and overburdened ATC systems increase operational risks.

Aviation Safety Protocols in India

- **DGCA** – Main regulator for aviation safety under Ministry of Civil Aviation.
- **Civil Aviation Requirements (CARs)** – Rules for airworthiness, pilot training, duty hours, emergency response, etc.
- **Safety Management System (SMS)** – Mandatory system for airlines/airports to identify and manage safety risks.
- **Audits & Surveillance** – Regular checks by DGCA (ramp checks, inspections, airworthiness surveillance).
- **ICAO Compliance** – Follows global standards under ICAO Annexes (esp. Annex 6 & 13).
- **AAIB** – Independent body for aircraft accident investigations.
- **Pilot Training & Licensing** – Strict licensing, simulator checks, and periodic recertification.
- **e-GCA Portal** – Digital platform for regulatory compliance and safety records.
- **International Partnerships** – Aligns with IATA and ICAO for safety benchmarking.

Way Forward

- **Strengthen DGCA oversight** with real-time audits and global best practices.
- **Standardise training and safety protocols** across all merged airline entities.
- **Invest in AI-based predictive maintenance** and diagnostics.
- **Upgrade airport safety systems** and bird hazard management.
- **Foster transparency** in accident investigations and enforce follow-up actions.

India's ambition to lead in global aviation must be matched by a **non-negotiable commitment to safety**. The Air India tragedy is a wake-up call—**modern fleets, skilled crews, and credible regulation** must work in sync to ensure the country's aviation story doesn't soar with risk.

Q. Regarding safety issues in India's aviation sector, consider the following statements:

1. DGCA regulates safety via Civil Aviation Requirements for airworthiness and pilot training.
2. AAIB independently investigates aviation accidents to recommend safety measures.
3. e-GCA portal enables digital compliance and safety record monitoring.
4. India is exempt from ICAO safety standards.

Which of the statements given above are correct? ***[UPSC Pre. Practice Question]***

(a) 1, 2, and 3 only (b) 1, 3, and 4 only

(c) 2 and 4 only (d) 1, 2, and 4 only

Ans. (a) 1, 2, and 3 only

11.2.3. ASSAM AND MEGHALAYA TO SET UP JOINT HYDROPOWER PROJECT

Why in the News?

In a significant step toward regional cooperation, Assam and Meghalaya have announced a joint 55-MW hydropower and irrigation project on the Kulsi River. The initiative aims to tackle Guwahati's urban flooding and aid in resolving a 52-year-old border dispute between the two states.

Powering Progress: The Kulsi Hydropower and Irrigation Project

- The proposed project, to be developed on the **Kulsi River**, a tributary of the Brahmaputra, is set to **generate electricity for both states** while providing **irrigation support to Assam**. The river, also a known habitat of the **endangered Gangetic river dolphin**, makes this an ecologically sensitive development.
- Both state governments have committed to ensuring **local community involvement** through consultations, aiming to balance development with ecological preservation.

Combating Urban Flooding in Guwahati

Guwahati has long grappled with urban flooding. The new partnership includes plans to engage the **North Eastern Space Application Centre** for **satellite mapping** of flood-prone zones. Additionally, **IIT Roorkee** will assist in analyzing causes and devising long-term flood mitigation strategies—marking a major scientific collaboration for urban resilience.

Resolving a Longstanding Boundary Dispute

The two states have made notable progress in resolving their **decades-old border conflict**, agreeing on **six of the twelve disputed areas**. Plans are underway to install **boundary pillars in five sectors by August 15**, with remaining disputes being addressed through mutual negotiation and land adjustment discussions.

A Model for Cooperative Federalism

This joint initiative highlights the evolving nature of **collaborative governance** in India. Both **Chief Ministers, Himanta Biswa Sarma (Assam) and Conrad K. Sangma (Meghalaya)**, emphasized cooperation over conflict, especially in shared challenges like energy needs, natural disasters, and infrastructure development.

Looking Ahead: A Shared Future

Beyond power and flood control, this collaboration could unlock wider **economic, environmental, and tourism opportunities** for the region. If successfully implemented, the Kulsi project may become a **template for inter-state partnerships**, showcasing how dialogue-driven governance can fuel inclusive growth and harmony.

The Assam-Meghalaya partnership reflects a shift toward pragmatic, people-centric governance. With a focus on sustainability, mutual benefit, and conflict resolution, this initiative sets a strong precedent for cooperative federalism in India's northeastern states.

Q. Discuss the significance of scientific and technological interventions in managing urban flooding, with reference to the collaboration between Assam, Meghalaya, the North Eastern Space Application Centre, and IIT Roorkee in the Kulsi River hydropower project. How can such collaborations contribute to urban resilience and disaster risk reduction?

[UPSC MAINS Practice Question]

11.2.4. WORLD NO TOBACCO DAY

Why in the News?

World No Tobacco Day is observed annually on May 31 to raise awareness about tobacco's harmful effects and promote policies to reduce its use. Initiated by WHO in 1987 and recognized in 1988, it highlights the global tobacco epidemic.

World No Tobacco Day 2025:

Theme — **"Bright Products. Dark Intentions. Unmasking the Appeal."**

Focuses on tobacco industry tactics targeting youth through digital marketing, attractive packaging, and flavored products.

Significance of World No Tobacco Day 2025

The observance serves to:

- Raise public awareness about the severe health risks associated with tobacco and nicotine use.
- Expose the deceptive tactics of the tobacco industry aimed at expanding their consumer base, especially among adolescents and young adults.
- Advocate for strong policy measures such as higher taxes on tobacco products and mandatory health warnings on packaging.
- Celebrate success stories of individuals and groups who have successfully quit tobacco, encouraging others to follow suit.

Key Facts on Tobacco Use and Impact

- Tobacco causes approximately 8 million deaths worldwide every year, including over 1.2 million deaths from secondhand smoke exposure.
- Around 37 million adolescents aged 13 to 15 are addicted to tobacco products.
- E-cigarettes and vaping products have gained widespread popularity, particularly among youth.
- The global economic burden due to tobacco-related health costs and productivity losses exceeds $1.4 trillion annually.

Tobacco Control Initiatives: A Global and Indian Perspective

- **Global Efforts:** The Union for International Cancer Control (UICC) actively supports World No Tobacco Day by focusing on the link between tobacco and cancer, reinforcing the urgency of tobacco control.
- **India's Response:** The National Tobacco Control Program (NTCP) leads India's fight against tobacco by focusing on reducing tobacco cultivation, restricting production, limiting consumption, and supporting cessation efforts. The NTCP also works to implement strategies outlined in the WHO Framework Convention on Tobacco Control (FCTC), ensuring a comprehensive approach to combat tobacco use.

World No Tobacco Day 2025 highlights the need to expose tobacco industry's deceptive marketing and strengthen policies to protect public health, especially among youth.

Q. Discuss the health, economic, and social impacts of tobacco use and the challenges posed by industry marketing. Suggest effective policy measures for tobacco control, with a focus on protecting youth. ***[UPSC MAINS Practice Question]***

11.2.5. WHA'S LANDMARK RESOLUTION ON SKIN DISEASES

Why in the News?

For the first time ever, the **78th World Health Assembly** unanimously passed a resolution titled ***"Skin Diseases as a Global Public Health Priority"*,** marking a significant step in acknowledging that skin health is vital to the overall well-being and dignity of people worldwide.

Background and Rationale

- **Global Burden**: Skin diseases affect an estimated **1.9 billion people worldwide**, yet remain **under-recognized and underfunded**, particularly in **low- and middle-income countries (LMICs)**.
- **Advocacy and Sponsorship**:
  - Resolution spearheaded by countries like **Côte d'Ivoire, Nigeria, Togo**, and **Micronesia**.
  - Strongly supported by the **International League of Dermatologic Societies (ILDS)**—the largest global alliance of dermatology organizations

Key Provisions of the WHA Resolution

- **Global Action Plan** for:
  - **Prevention**
  - **Early detection**
  - **Effective treatment**
  - **Long-term care for skin diseases**
- **Investment and Research**:
  - Urges **dedicated health funding**
  - Expansion of **research, surveillance, and data collection**
  - Integration of skin care in **primary healthcare systems**
- **Policy Advocacy**:
  - Encourages inclusion of dermatologic care in **national health agendas**
  - Supports **insurance coverage** and **anti-stigma measures**

Regional Significance

- **For India, Africa, and LMICs:**
  - Chronic inflammatory diseases (e.g. **psoriasis**, **vitiligo**, **leprosy**) are **highly prevalent** but neglected.
  - Skin conditions are often **stigmatized**, especially in darker skin tones, impacting **self-esteem**, **employment**, and **social inclusion**.
  - Lack of **dermatology training** and **infrastructure** in public healthcare limits access to timely treatment.

What May Change

- **Policy Shifts**: Skin care integration into public health systems and awareness campaigns.
- **Research Expansion**: Greater representation of **skin-of-colour studies**.
- **Capacity Building**: Training frontline workers and community dermatology programs.

- **Global Awareness**: Official recognition of skin diseases reduces stigma and enhances patient support systems.

This landmark WHA resolution is a **milestone**, not a finish line. It calls upon global health systems to:

- Treat skin health as **essential**, not **superficial**,
- Empower patients with **dignity** and **access**, and
- Embed skin disease management into the broader framework of **universal health coverage**.

"Visible. Vulnerable. Vital. Skin health is finally being seen—for what it truly is."

Q. The term "skin diseases as a global public health priority", recently in the news, is associated with which of the following global forums? ***[UPSC Pre. Practice Question]***

(a) World Economic Forum

(b) G20 Health Ministers' Meeting

(c) World Health Assembly (WHA)

(d) International Dermatology Summit

Ans. (c) World Health Assembly (WHA)

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