Current Affairs
(CONSOLIDATION)

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Polity and Governance

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APAAR: One Nation One Student ID Card

Why in News?

Recently, the National Conference on **APAAR: One Nation One Student ID Card** was held in New Delhi.

➢ Vital interconnection between **APAAR IDs, the Academic Bank of Credit, and Digilocker,** facilitating streamlined operations, was also highlighted in the event.

What is APAAR?

➢ **About**: APAAR, an acronym for **Automated Permanent Academic Account Registry,** is a specialised identification system designed for all students in India, beginning from an early age.

 ○ It is introduced in accordance with the **National Education Policy (NEP) of 2020** and the **National Credit and Qualifications Framework (NCrF).**

 ○ Registration for an APAAR ID is voluntary, not mandatory.

➢ **Objective**: It aims to streamline and enhance the academic experience for students throughout India by assigning a **unique and permanent 12-digit ID to each student,** consolidating their academic records into a single accessible platform.

 ○ It is emphasised as not only a vital tool for tracking the educational progress of 260 million students in India but also as an **aspirational and globally recognized document for students.**

➢ **Benefits:**

 ○ APAAR ensures accountability and transparency in education by tracking student progress and streamlining academic records.

○ It enhances efficiency, combats fraud, and includes co-curricular achievements for holistic student development.

○ With multiple use cases, APAAR facilitates a smooth transfer process and supports **data-driven decision-making** in educational institutions.

○ It also enables students to easily share their academic records for enhanced access to employment.

➢ **Related Concerns:**

○ **Privacy Concerns:** Consolidating academic records into a centralised database raises concerns about the privacy and security of student data.

● The proliferation of digital identities through APAAR IDs may increase the risk of **identity theft or fraudulent activities,** requiring robust security measures.

○ **Digital Divide:** There is a risk that students from **marginalised or remote communities** may not have equal access to digital platforms, potentially widening existing educational disparities.

What is the Academic Bank of Credits and DigiLocker?

➢ **Academic Bank of Credits:** As per NEP 2020, the Academic Bank of Credits (ABC) has been envisaged to facilitate the **academic mobility of students** with the freedom to study across the education Institutions in the country with an appropriate **"credit transfer" mechanism** from one programme to another.

○ If the student changes schools, whether within the state or to another state, all their data in the ABC gets transferred to her/his new school just by sharing the **APAAR ID.**

➢ **DigiLocker:** It is a cloud-based platform that allows users to store, issue, and verify documents and certificates digitally.

○ It is a flagship initiative of the **Ministry of Electronics & IT (MeitY)** under **Digital India programme.**

○ The issued documents in DigiLocker system are deemed to be at par with original physical documents as per **Rule 9A of the Information Technology (Preservation and Retention of Information by Intermediaries providing Digital Locker facilities) Rules, 2016**.

Smart Gram Panchayat

Why in News?

Recently, the Union Minister of Rural Development and Panchayati Raj inaugurated the **'Smart Gram Panchayat: Revolution towards Digitization of Gram Panchayat'** Project at Paprour Gram Panchayat of Begusarai District, Bihar signalling a significant leap towards **digital empowerment** in rural India.

What is the Smart Gram Panchayat Project?

➢ The project aims to extend the **PM-WANI (Prime Minister's Wi-Fi Access Network Interface) Service** to Gram Panchayats in Begusarai, marking a paradigm shift in rural connectivity.

○ Begusarai leads the digital transformation in Bihar by equipping all Gram Panchayats with Wi-Fi services under the **PM-WANI Scheme.**

➢ It is funded under the revamped **Rashtriya Gram Swaraj Abhiyan (RGSA),** the project targets 455 Gram Panchayats across 37 Blocks in Begusarai and Rohtas Districts in Bihar. The Ministry of Panchayati Raj implements it**.**

➢ Emphasis is placed on **using technology to enhance access to online services** in critical sectors like health, education, and skilling, improving the quality of life in rural areas.

○ Students, farmers, artisans, and Women **Self-Help Groups (SHGs)** are among the beneficiaries of this initiative.

➢ Robust mechanisms for Operation & Maintenance (O&M) will be instituted to sustain the project's impact over time.

➢ The project aims to **bridge the rural-urban divide**, foster accountability, and efficiency in **local self-governance**, and empower communities through digital footprints.

Rashtriya Gram Swaraj Abhiyan (RGSA):

➢ The RGSA is a scheme of the **Ministry of Panchayati Raj,** launched in, 2018. Later it was revamped and the **Centrally Sponsored Scheme** of RGSA was approved for implementation from **2022-23 to 2025-26** for capacity **building of elected representatives** (ERs) **of Panchayati Raj Institutions (PRIs)**.

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➢ The primary objective of Revamped RGSA is to develop the governance capabilities of the Panchayats to deliver on **Sustainable Development Goals (SDGs)** which are covered within the purview of Panchayats.

➢ Under the scheme basic orientation training for ERs of Panchayats is to be ensured within 6 months of election and refresher training within 2 years. The funding pattern for the State components is in the ratio of **60:40 among Central** and **States** respectively, except Northeast Hilly States and UT of J & K where Central and State Share is in the ratio **of 90: 10. For other UTs, the Central share is 100%.**

➢ **RGSA focuses on:**

➢ **Strengthening Panchayat-SHG convergence** and training at various levels on **e-Governance** and **Localization of SDGs.**

➢ Utilising emerging technologies for interactive capacity building and standardised training. Capacitating PRIs on digital literacy and leadership roles.

What is PM-WANI?

➢ **About:**

○ PM-WANI, launched by the **Department of Telecom (DoT)** in December 2020, promotes **public WiFi hotspots for nationwide digital connectivity.** Any entity can set up hotspots, aligning with the **National Digital Communications Policy, 2018 (NDCP)** aims for robust digital infrastructure in rural areas.

➢ **PM-WANI Ecosystem:**

○ **Public Data Office (PDO):**

● PDOs set up and manage PM-WANI Wi-Fi hotspots, providing **last-mile broadband connectivity** to subscribers by procuring internet bandwidth.

○ **Public Data Office Aggregator (PDOA):**

● PDOA will provide **aggregation services** such as authorisation and accounting to PDOs, thereby facilitating PDOs in providing services to the end consumer.

○ **App Provider:**

● App Providers develop **apps for user registration, Wi-Fi hotspot discovery,** and authentication for accessing PM-WANI compliant services.

○ **Central Registry:**

● It will maintain the details of App Providers, PDOAs, and PDOs. It is currently maintained by the **Centre for Development of Telematics (C-DoT).**

➢ **Benefits:**

○ PM-WANI will boost **broadband availability and affordability in rural areas,** fostering entrepreneurship and **digital inclusion**. It complements **BharatNet initiatives.**

○ It can provide an affordable and convenient option for internet access, as compared to mobile **technologies like 5G,** which require high investment and subscription costs.

MGNREGA Unemployment Benefits Disbursement

Why in News?

The **Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA),**2005 has been a crucial lifeline for **rural workers in India**. However, a recent report by the **Parliamentary Standing Committee on Rural Development and Panchayati Raj** has shed light on a concerning issue regarding the implementation of the scheme.

What are the Key Highlights of the Report?

➢ **Limited Distribution of Benefits:**

○ The report reveals that out of 7,124 eligible workers in the last five years, only 258 received benefits, accounting for **approximately 3% of the total.**

● According to Section 7(1) of MGNREGA, 2005, individuals **not employed within 15 days are entitled to a daily unemployment allowance**.

➢ **State-specific Data:**

○ State governments are responsible for providing unemployment allowance based on their economic capacity.

○ **Karnataka** reported the highest number of eligible workers (2,467) but **none received benefits.**

○ Rajasthan ranked second, with 1,831 eligible workers, of which only nine received benefits.

● Bihar, West Bengal, Jharkhand, and Uttar Pradesh also showed poor distribution records.

- ❍ Despite eligibility, workers in these states either received inadequate benefits or none at all.
- ➤ **Pending Compensation for Delayed Wages:**
  - ❍ The committee was informed that from the financial year 2018-19 until November 21, 2024, a total of over Rs 13 crores was sanctioned for compensation, and **only around Rs 10 crores were paid, leaving a significant amount pending.**
    - The responsibility of paying interest lies with the **state government,** according to the **Department of Rural Development.**
  - ❍ The MGNREGA states that **if wages are not paid within 15 days** of the closure of the muster roll, workers are entitled to compensation for the delay. The **compensation is 0.05%** of the unpaid wages per day of delay beyond the sixteenth day of closure of the muster roll.
- ➤ **Recommendations by the Committee:**
  - ❍ The committee recommended coordinated efforts between the **Central Rural Development Department and state governments** to ensure proper disbursement of benefits.
  - ❍ Measures should be taken to address the non-payment of unemployment benefits.

Mahatma Gandhi National Rural Employment Guarantee Act

- ➤ MGNREGA is one of the largest work guarantee programs in the world launched in **2005 by the Ministry of Rural Development.**
- ➤ MGNREGA is a **demand-based wage employment scheme** that provides at least **100 days of guaranteed wage employment** to each family per fiscal year to improve the livelihood security of families in rural areas of the country.
  - ❍ It provides livelihood security, which means that rural households have **alternative sources of income** when better employment opportunities are unavailable.
  - ❍ There are **14.32 crore registered Job Cards,** with 68.22% active Job Cards, and a total of 25.25 crore workers, of which 56.83% are active workers.
- ➤ **Achievements of MGNREGA in 2022-23:**
  - ❍ 11.37 crore households availed employment.
  - ❍ 289.24 crore person-days employment has been generated out of which:
    - 56.19% were for women
      - ▪ 19.75% were for Scheduled Castes (SCs)
      - ▪ 17.47% were for Scheduled Tribes (STs).

Potential of India's AVGC-XR Sector

Why in News?

India's **Animation, Visual Effects, Gaming & Comics and Extended Reality (AVGC-XR) sector** is all set for a quantum leap in the next five to six years.

What is the Outlook of India's AVGC-XR Sector?

- ➤ **Industry Landscape:**
  - ❍ India boasts a robust ecosystem with over 4,000 studios, with key hubs in Mumbai, Bengaluru, Pune, Hyderabad, and Chennai. Additionally, smaller towns are witnessing a **surge in studio establishments**, highlighting the sector's widespread expansion.
  - ❍ India's rich cultural heritage, diverse art forms, and skilled artists serve as the foundation for its prowess in visual arts. The industry is now recognizing the immense potential for value creation and employment generation within this domain.
- ➤ **Employment:**
  - ❍ Most of the direct job positions will come for content developers, animators, pre- and post-production artists, pre-visualisation artists, compositors, etc.
  - ❍ The industry is witnessing a high pace of growth with some segments within AVGC-XR already growing at 30 or 35% annually.
- ➤ **Projected Growth:**
  - ❍ The AVGC-XR sector, currently employing 2.6 lakh individuals, anticipates creating 23 lakh direct jobs by 2032, with revenues expected to soar to over USD 26 billion by 2030 from the current USD 3 billion.
  - ❍ India's contribution to the global AVGC-XR sector is a mere 0.5%, as per the government data, India has the potential **to capture 5% (USD 40 billion)** of the **global market share by the year 2025**, with an annual growth of **around 25-30% and creating over 1,60,000 new jobs annually.**

What are the Challenges Associated to AVGC Sector?

- ➤ **Lack of Authentic Data:**
  - ❍ Non-availability of data such as employment, industry size, education intuitions, etc. for the AVGC sector, makes decision-making tougher for entities.

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➢ **Skill Gap in Education and Employment sector:**
  - ❍ Creation of the AVGC ecosystem within the country requires a workforce with specialised skills for various roles such as animators, developers, designers, localization experts, product managers, etc.

➢ **Infrastructure Constraints:**
  - ❍ In the absence of adequate training infrastructure, there is deterioration in the quality of training being delivered to students, thus impacting the quality of output and human resources for the AVGC industry.

➢ **Less focus on Research Development:**
  - ❍ There is also a need to develop research related narrative for the AVGC-XR sector, so that dedicated focus can be given to it.

➢ **Absence of an AVGC Academic Reference Point:**
  - ❍ There is no apex institute in India for the AVGC sector unlike other sectors such as engineering, design, management, packaging, etc.

➢ **Availability of Funds:**
  - ❍ At present there is no dedicated fund available for the promotion of the AVGC sector which acts as an obstacle for the growth of the sector in India.

➢ **Lack of Globally-Popular Indian IPs:**
  - ❍ The AVGC sector in general has suffered a lack of original Indian **intellectual property** as most work in this sector is outsourced.
  - ❍ Animation industry is dominated by services to other countries and thus it is important to incentivize local production with additional concessions to increase local IP.

What are the Government Initiatives to Promote the AVGC-XR Sector?

➢ **Educational Integration:**
  - ❍ The **National Education Policy (NEP) 2020** has integrated creative arts, design, and sports into the school curriculum from Class 6 onwards, fostering a conducive environment for nurturing talent in AVGC-XR.
  - ❍ Around 5,000 CBSE and state board schools have introduced AVGC-XR learning, with plans for expansion nationwide. This initiative aims to redefine animation as a form of family entertainment suitable for all ages.

➢ **Policy Framework:**
  - ❍ To unleash the scope of the AVGC sector, **Union Budget 2022-23** announced for setting up of an

AVGC Promotion Task Force to recommend ways to realise and build domestic capacity for serving Indian markets and the global demand.
  - ❍ Collaborative efforts between industry bodies like FICCI, ABAI (Association of Bangalore Animation Industry), SAIK (Society of AVGC Institutions in Kerala), and government entities are underway to formulate robust policies tailored to each state.
    - States like Karnataka, Maharashtra, and Telangana have already implemented proactive measures to support the sector's growth.

Ministry of Information and Broadcasting, Government of India

Making India the global hub for AVGC

Recommendations of the AVGC Task Force for promotion & growth of the AVGC sector

Enhancing Technology & Financial Viability for Indian AVGC Industry

Enhanced **Ease of Doing Business** in AVGC sector

Start-Up India to provide **technical, financial & market access assistance** to AVGC entrepreneurs

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Ministry of Information and Broadcasting, Government of India

Making India the global hub for AVGC

Recommendations of the AVGC Task Force for promotion & growth of the AVGC sector

Domestic Industry Development for Global Access

'Create in India' campaign for Content Creation In India, For India & For the World!

National Centre of Excellence (COE) for **skilling, education, industry development & research & innovation** for the AVGC sector

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Nazool Land

Why in News?

Recently, violence erupted in the Haldwani city of Nainital District, Uttarakhand's Haldwani district after the city administration **conducted a Demolition Drive** to remove Encroachment at the site of a mosque and madrasa, allegedly on **Nazool Land**.

➢ As per the Haldwani district administration, the property where the two structures are situated is registered as the **Municipal Council's Nazool land.**

What is Nazool Land?

➢ **About:**
  ○ Nazool land is **owned by the government** but most often not directly administered as state property.
    ● The state generally allots such land to any entity **on lease for a fixed period**, generally between **15 and 99 years.**
  ○ In case the lease term is expiring, one can approach the authority to **renew the lease by submitting a written application** to the Revenue Department of the local development authority.
  ○ The government is **free to either renew the lease or cancel it** — taking back Nazool land.
    ● In almost all major cities of India, **Nazool land has been allotted to different entities** for a variety of different purposes.

➢ **Emergence of Nazool Land:**
  ○ During British rule, kings and kingdoms which opposed the British frequently **revolted against them**, leading to **several battles between them** and the British Army. Upon defeating these kings in battle, the British would **often take their land away from them**.
  ○ After India got Independence, the **British vacated these lands.** But with kings and royals often lacking proper documentation to prove prior ownership, these **lands were marked as Nazool land** — to be owned by the **respective state governments.**

➢ **Purpose of Nazool Land:**
  ○ The government generally use**s Nazool land for public purpose**s like building schools, hospitals, Gram Panchayat buildings, etc.
  ○ Several cities in India have also seen **large tracts of land denoted as Nazool land** used for housing societies, generally on lease.

  ○ While several states have brought in government orders for the purpose of framing rules for Nazool land, **The Nazool Lands (Transfer) Rules, 1956** is the law mostly used for Nazool land adjudication.

What is an Encroachment?

➢ **About:**
  ○ It is the **unauthorised use or occupation of someone else's property.** This can occur on abandoned or unused spaces if the legal owner is not actively involved in its upkeep. It is important for **property owners to be aware of the legal steps** to take and their rights in such cases.
  ○ Urban encroachment refers to the **unauthorised occupation** or use of land or property within urban areas.
  ○ This could include **illegal construction, squatting, or any other form of occupation** without proper permission or legal rights.
    ● Land encroachment, as defined by **Section 441 of the Indian Penal Code (IPC), 1860**, is the act of unlawfully entering someone else's property without permission to commit an offence, threaten possession of the property, or stay on the land uninvited.

➢ **Procedure for Removing Illegal Encroachments:**
  ○ Before taking any action, the **municipal authorities are usually required to issue notices** to the individuals or establishments involved in illegal encroachments.
  ○ Courts, including the Supreme Court, have emphasised the importance of due process and have often ruled that **proper notice and opportunity to be heard are essential before any demolition is carried out.**
    ● In the *1985 Olga Tellis case,* emphasising the right to livelihood and rights of slum dwellers, SC had noted that the right to livelihood is a part of right to life.
  ○ If the individuals fail to respond or do not provide a satisfactory explanation, the municipal authorities **may proceed with the demolition process.**
  ○ The authorities are generally expected to act proportionally, considering the nature of the violation and the response taken to adhere to principles of natural justice.

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Safeguarding Children in Digital Spaces

Why in News?

Recently, heightened concerns have emerged regarding **children's safety in digital spaces**. Rising incidents of **online exploitation** have prompted calls for urgent action. Amid evolving digital landscapes, safeguarding children's rights is paramount.

What are the Challenges for Children in the Digital Spaces?

➢ **Cyberbullying:**
  ○ **Definition:**
    ● **Cyberbullying** is the use of digital platforms to harass, threaten, humiliate, or harm another person, especially a peer.
  ○ **Forms:**
    ● Abusive messages, rumours, hurtful comments, sharing private or embarrassing photos or videos, impersonating someone, or excluding someone from online groups.
  ○ **Impact:**
    ● Negative effects on children's mental health, self-esteem, academic performance, and social relationships. It can also lead to anxiety, depression, isolation, self-harm, or suicide.

➢ **Online Sexual Exploitation and Abuse:**
  ○ **Definition:**
    ● It is the use of digital platforms to **engage children in sexual activities or expose them to sexual content**, for the gratification or profit of the offender.
  ○ **Forms:**
    ● Producing, distributing, or accessing child sexual abuse material, grooming children for sexual purposes, soliciting children for sexual acts, livestreaming sexual abuse, or **sextortion.**
  ○ **Effects:**
    ● Can have devastating effects on **children's physical, psychological, and emotional health**, and can cause lifelong trauma and damage.

➢ **Privacy and data protection:**
  ○ **Definition:**
    ● Privacy and data protection is the right of children to control their personal information and how it is collected, used, shared, or stored by others, especially online.
  ○ **Violations:**
    ● It can be violated by tech companies, advertisers, hackers, or other third parties, who may collect, use, or sell children's data without their consent or knowledge, for commercial or malicious purposes.
  ○ **Consequences:**
    ● Can have harmful consequences for children, such as **identity theft, fraud, targeted marketing, manipulation, discrimination,** or exposure to inappropriate or dangerous content or contacts.

➢ **Digital literacy and citizenship:**
  ○ **Definition:**
    ● Digital literacy and citizenship is the ability and responsibility of children to use digital platforms effectively, safely, and ethically, and to participate in the online world as informed and active citizens.
  ○ **Challenges:**
    ● It can be challenged by the **proliferation of misinformation, disinformation, and hate speech** online, which can mislead, confuse, or harm children, and undermine their trust and values.
  ○ **Consequences:**
    ● Digital literacy can be hindered by the **lack of access, affordability, or quality of digital platforms** and technologies, which can create digital divides and inequalities among children.

➢ **Metaverse and Virtual Reality (VR):**
  ○ **Definition:**
    ● The metaverse is a virtual world that uses virtual reality, augmented reality, and other advanced technology to allow people to have lifelike experiences online.
  ○ **Forms:**
    ● Exploitation by virtual predators and **economic exploitation** through scams. **Harassment and discrimination** thrive in virtual environments, fostering cyberbullying and online discrimination based on users' identities.

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- Privacy violations are rampant, with **data mining and surveillance compromising** users' personal information and security.
  - **Negative Impacts of the Metaverse:**
    - Children may encounter graphic or violent content in virtual environments, leading to desensitization or emotional distress.
      - Continuous exposure to such content can desensitize children to violence or other inappropriate behaviours, impacting their emotional well-being.
- **Generative Artificial Intelligence (AI):**
  - **Definition:**
    - Generative AI refers to AI systems capable of producing new content, such as text, images, or music, based on patterns learned from existing data.
  - **Forms:**
    - Generative AI offers educational benefits and creative opportunities for children, but it also poses risks, including the **creation of persuasive disinformation and indistinguishable fake images, videos and information.**
  - **Vulnerabilities:**
    - Children's cognitive vulnerabilities make them susceptible to **misinformation, raising concerns** about the impact of AI-generated content on young minds.

Alarming Statistics on Online Child Safety

- **More than a third of young people** in 30 countries report being cyberbullied, with 1 in 5 skipping school because of it.
- 80% of children in 25 countries report feeling in danger of **sexual abuse or exploitation online.**
- **54% of those who regularly used the internet** as a child (now aged 18-20) were the victims of at least one online sexual harm, according to the WeProtect Global Alliance.

What Can Be Done to Keep Children Safe Online?

- **Prevention:**
  - Cyberbullying can be prevented and addressed by **educating children about online etiquette and empathy,** encouraging them to report any incidents, supporting the victims, and holding the perpetrators accountable.

- Teaching children **about responsible VR usage, digital citizenship, and online safety.**
- Digital literacy and citizenship can be enhanced by **teaching children how to access, evaluate, create, and share online content,** how to communicate and collaborate online, and how to respect and protect themselves and others online.
- **Tech Companies' Role:**
  - Tech firms must prioritize **'safety by design(SBD)',** acknowledging their role in safeguarding children's well-being online, as highlighted in recent Congressional hearings.
    - SBD puts user **safety and rights at the centre** of the design and development of online products and services. It focuses on the ways technology companies can **minimise online threats by anticipating, detecting and eliminating online harms** before they occur.
  - UNICEF recommends that tech companies apply the **highest existing data protection standards** to children's data in the **metaverse and virtual environments.**
- **Government Responsibilities:**
  - Assess and adjust **regulatory frameworks like the Child Abuse Prevention and Investigation Unit regularly to prevent violations** of children's rights in digital spaces.
  - Develop innovative initiatives like a **child online safety toolkit**, to help parents, educators, and other concerned adults protect children from online dangers.
  - Utilize regulatory power to combat harmful content and behaviour affecting children online.
- **Collective Responsibility:**
  - Recognize that **existing real-world rules for child protection** should extend to the online realm.
  - Emphasize the importance of collaboration between tech companies, governments, and organizations to ensure child safety online.

What are India's Initiatives Related to Cyber Security?

- **National Cyber Security Policy.**
- **Cyber Surakshit Bharat Initiative.**
- **Indian Cyber Crime Coordination Centre (I4C).**
- **Cyber Swachhta Kendra (Botnet Cleaning and Malware Analysis Centre).**

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➢ **Computer Emergency Response Team - India (CERT-In).**
➢ **Critical information infrastructure (CII).**

Water (Prevention and Control of Pollution) Amendment Bill, 2024

Why in News?

The two houses of the Parliament recently approved the **Water (Prevention and Control of Pollution) Amendment Bill, 2024.**

What are the Major Provisions of the Water (Prevention and Control of Pollution) Amendment Bill, 2024?

➢ **About**:
  ○ The **Water (Prevention and Control of Pollution) Act, 1974,** has long been a cornerstone of India's environmental legislation to ensure sustainable management of **water resources.**
  ○ The recent amendment seeks to address **certain shortcomings and adapt regulatory frameworks to contemporary needs**.
    ● Amendments in the Water Act are also necessary to make in line with the Air Act, as both laws contain similar provisions

➢ **Major Amended Provisions:**
  ○ **Decriminalisation of Minor Offences:** It focuses on **decriminalising minor offences** related to water pollution, alleviating fears of imprisonment for technical or procedural lapses.
    ● The rationale is to ensure penalties align with the severity of offences, promoting compliance without overly burdening stakeholders.
  ○ **Exemption for Certain Industrial Plants:** The amended bill empowers the central government to exempt specific categories of industrial plants from certain statutory restrictions, such as those outlined in **Section 25 regarding the establishment of new outlets and discharges.**
    ● This provision intends to streamline regulatory processes and reduce duplication of surveillance efforts, and alleviate unnecessary burdens on regulatory agencies, promoting efficiency.

  ○ **Enhanced Regulatory Oversight:** It introduces measures to enhance regulatory oversight and standardisation across states.
    ● It grants the central government authority to **prescribe guidelines for the nomination of chairpersons** of State Pollution Control Boards and issue directives regarding the **grant, refusal, or cancellation** of industry-related consents.
    ● It provides certain mandatory qualifications, experience, and procedures to ensure fair appointment of chairpersons.

➢ **Critiques:**
  ○ Critics argue that the bill also seeks to centralise all powers and is against the principle of federalism. They also argue that a subject like the environment is hard to tackle without some amount of stringent fear.
  ○ Some critics raise concerns about the potential impact on transparency in dealing with water pollution issues.
    ● They argue that by relaxing certain regulations, the accountability of industries and regulatory agencies might be compromised, leading to less transparency in environmental management.

What are the Salient Features of Water (Prevention and Control of Pollution) Act, 1974?

➢ **About**: It was enacted for the prevention and control of water pollution and maintaining or restoring the wholesomeness of water.
  ○ The Central and State Pollution Control Boards have been constituted under **Section 3 and 4** of the Act respectively.
  ○ The **Central Pollution Control Board (CPCB),** a statutory organization, was constituted in September, 1974 under the **Water (Prevention and Control of Pollution) Act, 1974.**
    ● Further, CPCB was entrusted with the powers and functions under the **Air (Prevention and Control of Pollution) Act, 1981.**
    ● It functions under the **Ministry of Environment, Forest and Climate Change (MoEFCC)** and coordinates with the State Pollution Control Boards and other agencies.
➢ **Previous Amendments**: The Act was amended in **1978 and 1988** to clarify certain ambiguities and to

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vest more powers in the Pollution Control Board. Salient obligations on the part of industries and local bodies are:

- **Prior consent** is required from the **State Pollution Control Boards** for establishing any industry or local body that discharges domestic sewage or trade effluent into water, streams, wells, sewers, or land.

- Upon receipt of the application, the State Board may grant consent with specific conditions and validity dates or refuse consent, providing reasons in writing.

- Similar provisions apply to industries discharging trade/effluent waste before the Act was enacted.

Performance of Information Commissions in India 2022-23

Why in News?

Recently, a report titled **"Report Card on the Performance of Information Commissions (ICs) in India, 2022-23"** by **Satark Nagrik Sangathan (SNS)** has revealed alarming statistics **regarding gender representation** and other **operational aspects** of these commissions based on an analysis of information accessed under the **Right to Information (RTI) Act, 2005** from 29 **information commissions** across India.

- SNS is an Indian non-governmental organization (NGO) promoting transparency and accountability, empowering citizens in democracy.

What are the Key Highlights of the Report?

- **Gender Disparity in Information Commissions:**
  - **Representation of Women:**
    - **Only 9%** of all Information Commissioners across the country are women, highlighting a significant gender disparity.
  - **Leadership Roles:**
    - Merely **5% of ICs have been headed by women**, and currently, none of them is led by a female commissioner.
  - **States Without Female Commissioners:**
    - **12 ICs,** constituting approximately 41%, **have never had a female commissioner** since their establishment.

- These states include Andhra Pradesh, Bihar, Chhattisgarh, Himachal Pradesh, Madhya Pradesh, Manipur, Meghalaya, Mizoram, Sikkim, Telangana, Uttarakhand, and West Bengal.

- **Background of Information Commissioners:**
  - **Retired Government Officials:**
    - Around 58% of ICs surveyed have a background as retired government officials.
  - **Legal Professionals:**
    - Approximately 14% of commissioners are lawyers or former judges, contributing to the diverse background of Information Commissions.

- **Functioning of Information Commissions:**
  - **Case Disposal Rates:**
    - Several ICs return a large number of cases without passing any orders, with the **Central Information Commission** and some **State Information Commissions returning 41% of received appeals or complaints.**
  - **Low Disposal Rates:**
    - Despite a high number of pending cases, some commissions have low **disposal rates per commissioner,** indicating potential **inefficiencies in case management.**
  - **Vacancies and Appointments:**
    - Lack of **timely and transparent appointments** is a significant issue, leading to several Commissions operating at reduced capacity and without a chief.
  - **Defunct Commissions:**
    - The **State Information Commissions** of Jharkhand, Telangana, and Tripura are **defunct due to the absence of new appointments**, affecting their ability to function effectively.
  - **Transparency Issues:**
    - The functioning of Information Commissions was found to be largely opaque, with only **8 out of 29 ICs stating that their hearings are open** for public attendance, highlighting transparency concerns.

What is the Central and State Information Commission?

- The Central Information Commission and State Information Commissions are **statutory bodies** established under the **Right to Information Act, 2005.**

➢ **Central Information Commission:**
  ❍ **Constitution:**
    ● Constituted by the Central Government via Gazette Notification.
    ● Includes **1 Chief Information Commissioner (CIC)** and up to **10 Information Commissioners (IC)** appointed by the President.
    ● Oath administered by the **President** as per the **First Schedule.**
  ❍ **Eligibility and Appointment Process for CIC/IC:**
    ● Candidates must be eminent in public life with expertise in various fields.
    ● **Cannot hold political office or any other office of profit.**
    ● The Appointment Committee comprises the Prime Minister (Chair), the Leader of the Opposition in Lok Sabha, and one Union Cabinet Minister nominated by the PM.
  ❍ **Term and Service Conditions of CIC and IC:**
    ■ CIC and IC hold office for a **5-year term or until age 65,** whichever is earlier **(not eligible for reappointment).**
    ■ CIC salary equivalent to **Chief Election Commissioner.**
    ■ IC Salary same as **Election Commissioner.**
    ■ **IC eligible for appointment as CIC** but limited to a total of five years, including the term as IC.
➢ **State Information Commission:**
  ❍ **Constitution of SIC:**
    ● Constituted by the State Government through Gazette notification.
    ● Includes 1 State Chief Information Commissioner (SCIC) and up to 10 State Information Commissioners (SIC) appointed by the Governor.
  ❍ **Eligibility and Appointment Process for SCIC/SIC:**
    ● The qualifications for appointment as SCIC/SIC shall be the **same as that for Central Commissioners.**
    ● The Appointments Committee will be headed by the Chief Minister. Other members include the Leader of the Opposition in the Legislative Assembly and one Cabinet Minister nominated by the Chief Minister.

    ● The salary of the **SCIC will be the same as that of an Election Commissioner.** The salary of the SIC will be the same as that of the Chief Secretary of the State Government.
➢ **Powers and Functions of Information Commissions:**
  ❍ Duty to receive complaints regarding information requests and non-compliance.
  ❍ Power to order inquiry based on reasonable grounds.
  ❍ Authority akin to a Civil Court for summoning persons, requiring evidence, etc.
  ❍ Ensures compliance with decisions, including penalties for non-compliance.
  ❍ The Central Information Commission can exercise powers and perform functions autonomously without being subjected to directions by any other authority.
➢ **Location:**
  ❍ The headquarters of the Central Information Commission is in **Delhi**, with the authority to establish offices in other places in India with the Central Government's prior approval.

SC Questions Amendment of Preamble

Why in News?

Recently, a **Supreme Court** bench while hearing a petition seeking to delete the words 'socialist' and 'secular' from the Preamble, asked if the **Preamble** of the **Constitution** could have been amended without changing the date of its adoption on November 26, 1949.

➢ The Preamble was **amended only once in 1976** to introduce the words 'socialist' and 'secular' through **42nd Constitutional Amendment Act.**

What is the Preamble to the Indian Constitution?

➢ **About:**
  ❍ A preamble is an introductory statement in a document that explains the document's philosophy and objectives.
    ● It was inspired by the Preamble of the **Constitution of the USA**.

Note:

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○ In a Constitution, it presents the intention of its framers, the history behind its creation, and the core values and principles of the nation.

○ The ideals behind the Preamble to India's Constitution were laid down by **Jawaharlal Nehru's Objectives Resolution**, adopted by the **Constituent Assembly** on January 22, 1947.

● N A Palkhivala, an eminent jurist and constitutional expert, called the Preamble as the '*identity card of the Constitution.*'

➢ **Components:**

○ It is indicated by the Preamble that the **source of authority of the Constitution lies with the people of India**.

○ Preamble declares India to be a **sovereign, socialist, secular and democratic republic.**

○ The objectives stated by the Preamble are to secure justice, liberty, equality to all citizens and promote fraternity to maintain unity and integrity of the nation.

○ The date is mentioned in the preamble when it was adopted i.e. **November 26, 1949.**

➢ **Status and Amendability:**

○ **Berubari Union Case, 1960:** Through the **Berubari case**, the Court stated that 'Preamble is the key to open the mind of the makers' but it **can not be considered as part of the Constitution**. Therefore it is not enforceable in a court of law.

○ **Kesavananda Bharati vs State of Kerala Case, 1973:** In this **case**, for the first time, a bench of 13 judges was assembled to hear a writ petition. The Court held that:

● The Preamble of the Constitution will now be **considered as part of the Constitution**.

● It held that the **Preamble could be amended** under **Article 368**, subject to the condition that no amendment is done to the **'basic structure'** of the Constitution.

■ Consequently the Preamble was amended by the 42nd Amendment Act, 1976 and the terms 'Socialist', 'Secular', and 'Integrity' were added to the preamble.

◆ **'Socialist' and 'Secular' were added** between 'Sovereign' and 'Democratic'.

◆ 'Unity of the Nation' was changed to '**Unity and Integrity of the Nation**'.

■ Furthermore the court held that the Preamble is not the supreme power or source of any restriction or prohibition but it plays an important role in the interpretation of statutes and provisions of the Constitution.

➢ **S R Bommai vs Union of India Case, 1994:** The Supreme Court again held that the Preamble is an integral part of the Constitution.

THE CONSTITUTION OF INDIA

PREAMBLE

WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a ¹[**SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC**] and to secure to all its citizens :

JUSTICE, social, economic and political;

LIBERTY of thought, expression, belief, faith and worship;

EQUALITY of status and of opportunity and to promote among them all;

FRATERNITY assuring the dignity of the individual and the ²[unity and integrity of the Nation];

IN OUR CONSTITUENT ASSEMBLY this twenty-sixth day of November, 1949 do **HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.**

1. Subs. by the Constitution (Forty-second Amendment) Act, 1976, Sec.2, for "Sovereign Democratic Republic" (w.e.f. 3.1.1977)
2. Subs. by the Constitution (Forty-second Amendment) Act, 1976, Sec.2, for "Unity of the Nation" (w.e.f. 3.1.1977)

Bills to Include PVTGs to ST List in Odisha and AP

Why in News?

Recently, **Parliament** passed two bills that aim to modify the lists of **Scheduled Castes (SC)** and **Scheduled Tribes (ST)** in Andhra Pradesh and Odisha. The bills were passed by **voice vote** in the Lok Sabha.

➢ The bills seek to include certain tribes to **Particularly Vulnerable Tribal Groups (PVTGs) and certain communities of the SC list to ST list**, based on the recommendations of the state governments, after consultation with the **Registrar General of India** and the National Commissions for Scheduled Castes & Scheduled Tribes.

Note:

Voice Vote
➤ It involves the speaker putting a question to the house and then **asking the house to put forward its opinion in the forms of ayes (yes) or noes.** Based on a rough measure of which side was louder, the speaker decides if the motion was passed or fell through.

What are the Bills and What do they Propose?

➤ **Andhra Pradesh:** The **Constitution (Scheduled Tribes) Order (Amendment) Bill, 2024** seeks to amend the **Constitution (Scheduled Tribes) Order, 1950,** in relation to Andhra Pradesh.

  ○ The Order lists the **tribes deemed to be Scheduled Tribes** in states and union territories.

  ○ The Bill adds the following **Particularly Vulnerable Tribal Groups (PVTGs)** to the list of STs in Andhra Pradesh: **(i) Bondo Porja, (ii) Khond Porja, and (iii) Konda Savaras.**

➤ **Odisha:** The Constitution **(Scheduled Castes and Scheduled Tribes) Orders (Amendment) Bill, 2024** amends the **Constitution (Scheduled Castes) Order, 1950 and the Constitution (Scheduled Tribes) Order, 1950** to modify the list of SCs and STs in Odisha.

  ○ PVTGs added to the Scheduled Tribes list in Odisha:

    ● Pauri Bhuyan and Paudi Bhuyan (included as synonyms of Bhuyan Tribe).

    ● Chuktia Bhunjia (recognized as Bhunjia tribe).

    ● Bondo community (sub-tribe of Bondo Poraja).

    ● Mankidia community (synonym of Mankirdia tribe).

  ○ **Odisha's ST list expanded with two new entries: Muka Dora** (also Mooka Dora, Nuka Dora and Nooka Dora) and **Konda Reddy** (also Konda Reddi) tribes.

  ○ The Bill removes Tamadia and Tamudia communities from the list of SCs in Odisha and adds them to the list of STs.

Note: The bills only added synonyms, phonetic variations, and sub-tribes of existing STs in Odisha and Andhra Pradesh; **the count of PVTGs in India remains unchanged at 75.**

What is the Importance of these Bills?

➤ The amendment addresses **discrepancies in the treatment of certain tribes across different regions.**

  ○ Communities like **Konda Reddy and Muka Dora were recognized as ST in Andhra Pradesh** but faced discrimination in Odisha.

  ○ The inclusion of these groups in the ST list rectifies long-standing disparities, **ensuring equitable access to government provisions and services.**

➤ PVTGS listed as STs gain access to **reservation quotas in education, employment, and political representation.**

  ○ ST status ensures affirmative action in educational institutions, allowing PVTG students to compete on a level playing field.

What is a Particularly Vulnerable Tribal Group?

➤ **About:**

  ○ A **PVTG is a sub-classification of a Scheduled Tribe** or section of a Scheduled Tribe that is considered more vulnerable than a regular Scheduled Tribe. The Indian Government created the PVTG list to improve their living.

    ● There are **75 PVTGs in India, the maximum 13 are in Odisha**, followed by 12 in Andhra Pradesh.

  ○ Article 342(1): The President with respect to any State/UT (after consultation with the Governor in case of state) may specify the tribes/tribal communities/part of or groups within tribes/ tribal communities as a Scheduled Tribe in that State/UT.

    ● Parliament may by **law include in or exclude from the list** of STs specified in a notification issued under article 342(1) any tribe or tribal community or part of or group within any tribe or tribal community, but save as aforesaid a notification issued under the said clause shall not be varied by any subsequent notification.

➤ **Initiatives:**

  ○ **PM-JANMAN**

  ○ **Janjatiya Gaurav Divas.**

  ○ **Viksit Bharat Sankalp Yatra.**

  ○ **PM PVTG Mission.**

WORLD TRIBAL DAY 2023

"International Day of World's Indigenous People"

- **About:** Celebrated annually on 9th August since 1994, declared by the UN
- **Theme 2023:** "Indigenous Youth as Agents of Change for Self-determination."

Tribal Population in India ↓

India has the 2nd largest tribal population in the world after Africa

- **Major Tribes: Bhils (largest),** Gonds, Munda, Santhals, Toto, Warli, **Andamanese (smallest)**
- **Famous Dances:** Santhali (Santhal), Dhimsa (Porja), Bhagoriya (Bhils), Elelakkaradi (Irular)
- **Constitutional Provisions:**
  - **5th Schedule:** Tribes' Advisory Council in States having Scheduled areas
  - **6th Schedule:** Administration of tribal areas (Assam, Meghalaya, Tripura and Mizoram)

ARTICLES	PROVISION FOR TRIBALS
Article 342 (1)	President's power to specify tribes as ST
Article 15(4)	Special provisions for OBCs (including STs)
Article 29	Protection of the Interests of Minorities (including STs)
Article 330	Reservation for STs in the Lok Sabha
Article 332	Reservation for STs in State Legislature
Article 243	Reservation in Panchayats
Article 275	Allocation of special funds for states for the welfare of STs with a better administration

Fifth Schedule Areas
Sixth Schedule Areas

- **Related Initiatives:**
  - PM PVTG Mission **(Budget 2023-24)**
  - Anamaya – Tribal Health Collaborative **(2021)**
  - 1000 Springs Initiative **(2020)**
  - Pradhan Mantri Van Dhan Yojana **(2018)**
  - Pradhan Mantri Adi Adarsh Gram Yojna (PMAAGY) **(2009-10)**
  - Eklavya Model Residential Schools **(1997-98)**
  - TRIFED **(1987)**

- **Related Committees:**
  - Kaka Kalelkar Commission, 1953 **(First Backward Classes Commission)**
  - Elwin Committee, 1959
  - U.N. Dhebar Commission, 1961
  - The Lokur Committee, 1965
  - The Shilu Ao Committee, 1966
  - The Bhuria Committee, 1991 **(Recommended PESA Act, 1996)**
  - Xaxa Committee, 2013

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Pradhan Mantri Matsya Kisan Samridhi Sah-Yojana and FIDF

Why in News?

Recently, the Union Cabinet approved the **"Pradhan Mantri Matsya Kisan Samridhi Sah-Yojana (PM-MKSSY)** and has granted an **extension to the Fisheries Infrastructure Development Fund (FIDF) for an additional 3 years** until 2025-26.

➢ The extension aims to cater to the infrastructure needs of the fisheries sector, ensuring sustained development and growth.

What is Pradhan Mantri Matsya Kisan Samridhi Sah-Yojana?

➢ **About:**
  - ○ PM-MKSSY, a **Central Sector Sub-scheme** under the **Pradhan Mantri Matsya Sampada (PMMSY)** for formalisation of the fisheries sector and supporting fisheries micro and small enterprises with an investment of over Rs. 6,000 crores over a period of next four years from FY 2023-24 to FY 2026-27 in all States/Union Territories.

➢ **Objectives:**
  - ○ **Gradual Formalisation of the unorganised fisheries sector** through self-registration of fishers, fish farmers and supportive workers under a **National Fisheries Sector Digital Platform (NFDP)**.

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- ❍ Facilitating access to **institutional financing** for fisheries sector micro and small enterprises.
- ❍ Providing a **one-time incentive** to beneficiaries for purchasing **aquaculture insurance**.
- ❍ Incentivising adoption and expansion of safety and quality assurance systems for fish, and fishery products and maintenance of jobs.

➢ **Intended Beneficiaries:**
- ❍ Fishers, **Fish (Aquaculture) Farmers**, fish workers, vendors, and other stakeholders in the fisheries value chain.
- ❍ Micro and Small enterprises - proprietary firms, partnership firms, cooperatives, federations, startups, **Fish FPOs** (FFPOs) and more engaged in fisheries and aquaculture.
  - ● FFPOs also include **Farmers Producer Organizations (FPOs).**
- ❍ Any other beneficiaries that may be included by the **Department of Fisheries** as targeted beneficiaries.

➢ **Implementation Strategy:**
- ❍ Component 1-A: Formalisation of Fisheries Sector:
  - ● NFDP to be established to formalise the unorganised fisheries sector by creating a national registry of stakeholders.
  - ● **Functions of NFDP:** Training, financial literacy improvement, project preparation assistance, and strengthening of fisheries cooperative societies.
- ❍ Component 1-B: Facilitating Adoption of Aquaculture Insurance:
  - ● Establishing insurance products for aquaculture, covering at least 1 lakh hectares, with a **maximum incentive of Rs. 1,00,000 per farmer** (farm size for the incentive is 4 hectares) and a 40% incentive for intensive aquaculture methods.
  - ● **Scheduled Castes (SCs), Scheduled Tribes (STs) and Women beneficiaries** receive an additional 10% incentive.
- ❍ Component 2: Supporting Microenterprises to Improve Fisheries Sector Value Chain Efficiencies:
  - ● Improving **value chain efficiencies** through the provision of performance grants. **Scale and Criteria for Performance Grants:**
    - ■ Microenterprises:
      - ◆ **General Category:** Grant capped at **25% of total investment or Rs. 35 lakhs.**

- ◆ **SC, ST, Women-owned:** Grant capped at **35% of total investment or Rs. 45 lakhs.**
  - ● **Village Level Organizations and Federations:** Grant not to exceed 35% of total investment or Rs. 200 lakhs (whichever is lower).
- ❍ Component 3: Fish and Fishery Product Safety and Quality Assurance Systems:
  - ● Incentivize fishery enterprises for **safety and quality,** fostering market **expansion and job creation,** particularly for women.
  - ● **Grants:**
    - ■ **Microenterprises:** Same as the one in Value Chain Efficiencies.
    - ■ **Small enterprises:** 25% of total investment or Rs. 75 lakhs (General Category), 35% of total investment or Rs.100 lakhs for (SC/ST/Women-owned).
    - ■ **Village-level orgs & Federations:** Same as the one in Value Chain Efficiencies.
- ❍ Component 4: Project Management, Monitoring, and Reporting:
  - ● Establishment of **Project Management Units (PMUs)** for managing, implementing, monitoring, and evaluating project activities.

Fisheries Sector in India:

➢ India's total fish output stood at **174 lakh tonnes in 2022-23**. India is the **third largest fish producer in the world**, contributing **8% to total global fish production.**

➢ Over a period of 10 years (2013-2023-24):
- ❍ Fish production increased by 79.66 lakh tonnes.
- ❍ Coastal aquaculture experienced robust growth during the period.
- ❍ **Shrimp** production surged by 270%.
- ❍ Shrimp exports more than doubled reflecting a 123% growth.
- ❍ Employment and livelihood opportunities created for ~**63 lakh fishers and fish farmers.**

➢ Coverage per fisherman under the **Group Accident Insurance Scheme (GAIS)** rose from Rs. 1.00 lakh to Rs. 5.00 lakh, benefiting a cumulative total of 267.76 lakh fishers.
- ❍ The extension of the **Kisan Credit Card (KCC) to fisheries in 2019** led to the issuance of 1.8 lakh cards.

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➤ Despite significant achievements, challenges persist in the sector, **including its informal nature, lack of crop risk mitigation, absence of work-based identities**, poor access to institutional credit, and sub-optimal safety and quality standards of fish sold by micro and small enterprises.

What is the Fisheries Infrastructure Development Fund (FIDF)?

➤ **About:**
  ○ It has been established by the Department of Fisheries (Ministry of Fisheries, Animal Husbandry & Dairying). **FIDF complements schemes like PMMSY and KCC.**
  ○ FIDF envisages the creation of fisheries infrastructure facilities both in marine and inland fisheries sectors.

➤ **Implementation Mechanism**
  ○ **Concessional Finance:** FIDF provides concessional finance to **Eligible Entities (EEs)** through Nodal Loaning Entities (NLEs) namely the **NABARD, National Cooperatives Development Corporation (NCDC)** and all **scheduled Banks.**
    ● EEs under FIDF include state governments, cooperatives, fisheries cooperative federations, NGOs, women entrepreneurs, private companies, and more.
  ○ **Interest Subvention:**
    ● Indian Government offers up to 3% per annum interest subvention.
    ● Repayment period spans 12 years, including a 2-year moratorium for providing the concessional finance by the NLEs at the minimum interest rate of 5% per annum.

FSSAI to Streamline Food Safety Regulations

Why in News?

In a recent meeting held in New Delhi, the **Food Safety and Standards Authority of India (FSSAI)** approved various amendments aimed at **simplifying food safety regulations and promoting ease of doing business.**

➤ FSSAI will issue a draft notification in this regard and will seek stakeholders' comments before finalising the amendments.

What are the Proposed Amendments in Food Safety and Standard Regulations?

➤ **Elimination of Multiple Certifications:**
  ○ The amendments aim to abolish the requirement for certification from the **Bureau of Indian Standards (BIS)** and **Agricultural Marketing (AGMARK)** certification for food products.
    ● Instead, **only certification from the FSSAI would be mandatory** if these changes are finalised.

➤ **Facilitation of Ease of Doing Business:**
  ○ The amendments align with the government's vision of **'One Nation, One Commodity, One Regulator,'** intending to simplify regulations and administrative processes for businesses operating in the food sector.

➤ **Expansion of Standards:**
  ○ Apart from the simplification of the certification process, the proposed amendments include the **establishment of standards for Mead (Honey wine)** and **Alcoholic Ready-to-drink (RTD) beverages**, and the introduction of standards for **'Haleem,'** a dish made of meat, pulses, grains, and other ingredients.
    ● Haleem currently lacks defined quality parameters.

What is the Food Safety and Standards Authority of India?

➤ **About:**
  ○ FSSAI is an **autonomous statutory body** established under the **Food Safety and Standards Act, of 2006.**
    ● The Act of 2006, consolidates various laws related to food, such as the **Prevention of Food Adulteration Act, 1954**, the **Fruit Products Order, 1955,** the **Meat Food Products Order, 1973,** and other acts that were previously handled by different ministries and departments.
      ■ The Act also aims to establish a **single reference point for all matters relating to food safety and standards**, by moving from multi-level, multi-departmental control to a single line of command.
  ○ FSSAI is responsible for **protecting and promoting public health** by regulating and supervising food safety and quality in India, operating under the **Ministry of Health & Family Welfare.**

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- ❍ FSSAI has a **headquarters in New Delhi** and regional offices in eight zones across the country.
- ❍ The Chairperson and Chief Executive Officer of FSSAI, appointed by central government. The Chairperson is in the **rank of Secretary to the Government of India.**

➢ **Functions and Powers:**
- ❍ Framing of **regulations and standards** for food products and additives.
- ❍ Granting of **licences and registration** to food businesses.
- ❍ Enforcement of food safety laws and regulations.
- ❍ **Monitoring and surveillance** of food safety and quality.
- ❍ Conducting **risk assessment and scientific research** on food safety issues.
- ❍ Providing **training and awareness** on food safety and hygiene.
- ❍ Promoting **food fortification** and organic food.
- ❍ Coordinating with other agencies and stakeholders on food safety matters.

➢ **Events and Campaigns:**
- ❍ **World Food Safety Day.**
- ❍ **Eat Right India.**
  - ● **Eat Right Station.**
    - ■ **Eat Right Mela.**
- ❍ **State Food Safety Index.**
- ❍ **RUCO (Repurpose Used Cooking Oil).**
- ❍ **Food Safety Mitra.**
- ❍ **100 Food Streets.**

Bureau of Indian Standards (BIS)

➢ BIS **is the National Standard Body** of India established under the BIS Act 2016. It operates under the **Ministry of Consumer Affairs**, Food, and Public Distribution.

➢ BIS is responsible for the harmonious development of standardisation, marking and quality certification of goods.
- ❍ BIS has its headquarters in New Delhi.

➢ The BIS Act, 2016, empowers the government to **authorise agencies beyond BIS for certification and enforcement of standards**.
- ❍ It includes consumer protection measures such as product recalls, compensation, and stricter penalties for non-conforming standard-marked products.

Agricultural Marketing(AGMARK)

➢ AGMARK is a **certification mark for agricultural produce,** assuring that they conform to a **grade standard** notified by the Directorate of Marketing & Inspection (DMI), Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture & Farmers Welfare under **Agricultural Produce (Grading Marking) Act, 1937.**

➢ These standards **differentiate between quality and 2-3 grades** are prescribed for each commodity.
- ❍ Till date, grade standards for 222 agricultural commodities have been notified.

Ladakh's Statehood Demand

Why in News?

Recently, the **Union Territory of Ladakh** observed a shutdown over demands for statehood and constitutional protection under the **Sixth Schedule**.

What are the Primary Demands Related to Ladakh?

➢ **Background:** Ladakh, once a part of the erstwhile **state of Jammu and Kashmir,** became a Union Territory following the abrogation of **Article 370** and the bifurcation of the state into two separate Union Territories in **August 2019.**
- ❍ Since then, the region has grappled with its newfound administrative status and has been **advocating for greater autonomy** and protection of its cultural and demographic identity.

➢ **Primary Demands:** The two socio-political organisations spearheading the movement are seeking protections for the UT previously enshrined under Article 370 and 35A. Their primary demands include:
- ❍ **Statehood for Ladakh:** Seeking to elevate Ladakh from its current Union Territory status to a full-fledged state, granting it greater political autonomy and decision-making powers.
- ❍ **Safeguards under the 6th Schedule:** Advocating for Constitutional provisions under the 6th Schedule to protect the **cultural, linguistic, and land rights** of the indigenous population.

Note:

○ **Reservation of Jobs:** Calling for reservations in employment opportunities for the youth of Ladakh, ensuring equitable access to economic resources and opportunities.

○ **Creation of Separate Parliamentary Constituencies:** Proposing the establishment of distinct Parliamentary constituencies for **Leh and Kargil,** reflecting the unique demographic and geographical characteristics of each region.

➢ The **Ministry of Home Affairs (MHA)** has set up a high-powered committee to engage with the representatives of the demands from Ladakh.

Note: Article 35A (no longer in effect) empowered the Jammu and Kashmir state's legislature to define "permanent residents" of the state and provide special rights and privileges to them which were not available to Indian citizens in general.

What are the Imperatives Behind Ladakh's Current UT Status?

➢ **Cultural and Demographic Differences:** Prior to its designation as a UT, Ladakh was part of the state of Jammu and Kashmir.

○ Ladakh's Buddhist majority contrasted significantly with the **Muslim-majority** population of the erstwhile state of J&K.

○ This difference often translated into concerns about resource allocation, political representation, and cultural preservation.

➢ **Security Considerations:** Ladakh borders sensitive regions like Pakistan and China, making strategic importance a significant factor.

○ Establishing it as a union territory allowed **for more direct and streamlined administration** from the central government in security matters.

➢ **Developmental Perspective:** The Indian government likely saw creating the union territory of Ladakh as a **way to address long-standing grievances**, improve administrative efficiency, and expedite development in the region.

What are the Constitutional Provisions Related to Formation of States in India?

➢ **Article 3** of the Indian Constitution grants **Parliament** the authority to undertake various actions regarding the **formation, alteration, or dissolution of states**. These actions include:

○ **Formation of New States**: Parliament can create a new state by separating territory from an existing state, uniting two or more states, or combining any territory with a part of an existing state.

○ **Increase or Decrease in State Area**: Parliament has the power to increase or diminish the area of any state.

○ **Alteration of State Boundaries**: Parliament can alter the boundaries of any state.

○ **Change of State Name**: Parliament can change the name of any state.

➢ **Conditions under Article 3:**

○ A bill proposing such changes must be **introduced in either house of the Parliament only with the prior recommendation of the President.**

○ Before recommending the bill, the President must refer it to the concerned state legislature to express its views within a specified period.

➢ **Additional Consideration:**

○ Parliament's authority to form new states includes the **ability to create a new state or union territory** by uniting a part of any state or union territory with another state or union territory.

○ Parliament is **not obligated to adhere to the views of the state legislature** and may accept or reject them, even if received on time.

○ For union territories, **no reference** needs to be made to the concerned legislature, and Parliament can take any action it deems appropriate.

○ Therefore, **India is an indestructible union of destructible states.**

What is the Sixth Schedule?

➢ **About: Sixth Schedule** contains special provisions for the administration of tribal areas in the four **northeastern states of Assam, Meghalaya, Tripura and Mizoram** under **Article 244(2) of the Indian Constitution**

Note:

➢ **Objectives:** It aims to safeguard tribal land and resources, **preventing their transfer to non-tribal entities**. It also strives to protect tribal communities from exploitation, ensuring their cultural and social identities are upheld and promoted.

➢ **Autonomous Districts and Regions:** The tribal areas within these states are to be administered as **Autonomous Districts**.

  ❍ In cases where different Scheduled Tribes inhabit an autonomous district, the Governor has the authority to divide the district into **Autonomous Regions**.

  ❍ The Governor is vested with the power to organise, reorganise, and alter the boundaries or names of autonomous districts.

➢ **District and Regional Council:** For each autonomous district, a **District Council** is to be constituted, comprising a maximum of 30 members.

  ❍ Of these, no more than **4 members are nominated by the Governor,** while the remainder are elected through adult suffrage.

  ❍ Likewise, a separate **Regional Council** is established for each area designated as an autonomous region.

Motion of Thanks

Why in News?

Recently, Prime Minister Narendra Modi replied to the **Motion of Thanks** on the **President's address** to **Parliament** in the **Rajya Sabha**, highlighting the significant milestones in India's journey towards the **75th Republic Day.**

What is a Motion of Thanks?

➢ The **Motion of Thanks is a parliamentary procedure** in which a formal motion is presented to express **gratitude or appreciation for the President's Address** to both Houses of Parliament.

  ❍ The President's Address is a **statement of policy of the Government** and, as such, is drafted by the Government. It contains a review of various

activities and achievements of the Government during the previous year and sets out the policies, projects and programmes which the Government wishes to pursue concerning important national and international issues.

➢ **Article 87 of the Constitution of India** states that the President will address both Houses of Parliament at the beginning of the **first session after each general election** and **at the beginning of the first session of each year**. The President will also inform Parliament of the reasons for its summons.

  ❍ The rules that govern the procedure of either House will make provisions for the allotment of time for discussion of the matters referred to in the address.

  ❍ Such an Address is called **a 'special address',** and it is also an annual feature.

➢ The address of the president, akin to the **'speech from the Throne' in Britain,** is **discussed in both Houses of Parliament** through a motion called the 'Motion of Thanks.'

  ❍ If any of the amendments are put forward and accepted then the Motion of Thanks is adopted in the amended form.

    ● Amendments may refer to matters contained in the Address as well as to matters which, in the opinion of the member, the Address has failed to mention.

  ❍ At the end of the discussion, **the motion is put to vote.**

➢ The discussion is concluded by the **reply of the Prime Minister or any other Minister.** Immediately thereafter, the amendments are disposed of and the Motion of Thanks is put to vote and adopted.

➢ The Motion of Thanks must be passed in the House. Otherwise, it amounts to the **defeat of the government.** It is one of the ways through which the Lok Sabha can also express a **lack of confidence in the government.**

➢ The **limitation** of motion of thanks is that the members cannot refer to matters that are not under the **direct responsibility of the Central Government** or mention the name of the President in the debate.

Note:

	Other Motions in Indian Parliament
Privilege Motion	▪ It is **moved by a member when he feels that a minister has committed a breach of privilege of the House** or one or more of its members by withholding facts of a case or by giving wrong or distorted facts. Its purpose is to censure **the concerned minister.** ▪ It **can be moved in Rajya Sabha as well as Lok Sabha.**
Censure Motion	▪ It **should state the reasons** for its adoption in the Lok Sabha. It **can be moved against an individual minister or a group of ministers** or the entire council of ministers. ▪ It is moved **to censure the council of ministers** for specific policies and actions. It **can be moved only in Lok Sabha.**
Call-Attention Motion	▪ It is introduced in the Parliament by a member **to call the attention of a minister to a matter of urgent public importance,** and to seek an authoritative statement from him on that matter. ▪ It **can be moved in Rajya Sabha as well as Lok Sabha.**
Adjournment Motion	▪ It is introduced in the Lok Sabha **to draw the attention of the House to a definite matter of urgent public importance.** It **involves an element of censure against the government.** ▪ It **can be moved only in Lok Sabha.**
No-Day-Yet-Named Motion	▪ It is a motion that has been admitted by the Speaker but **no date has been fixed for its discussion.** ▪ It **can be moved in Rajya Sabha as well as Lok Sabha.**
No Confidence Motion	▪ **Article 75 of the Constitution** says that the council of ministers shall be collectively responsible to the Lok Sabha. In other words, **the Lok Sabha can remove the ministry from office by passing a no-confidence motion.** The motion **needs the support of 50 members to be admitted.** ▪ It **can be moved only in Lok Sabha.**
Cut Motions	▪ A cut motion is **a special power vested in members of the Lok Sabha to oppose a demand being discussed for specific allocation by the government** in the Finance Bill as part of the Demand for Grants. ▪ If the motion is adopted, **it amounts to a no-confidence vote,** and if the government fails to jot up numbers in the lower House, it is obliged to resign according to the norms of the House. ▪ A motion may be moved to reduce the amount of a demand in any of the following ways: ○ **Policy Cut Motion:** It is moved so that the amount of the demand be reduced to Re.1 **(represents disapproval of the policy underlying the demand).** ○ **Economy Cut Motions:** It is moved so that the amount of the demand will be reduced by a **specified amount.** ○ **Token Cut Motions:** It is moved so that the amount of the demand is reduced by Rs.100 **(expresses a specific grievance).** ▪ It **can be moved only in Lok Sabha.**

Note:

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What are the Highlights of the President's Address?

➤ **Fastest-Growing Major Economy:**
- Despite global challenges, the President declared India as the **fastest-growing major economy,** maintaining a **growth rate of over 7.5%** for two consecutive quarters.

➤ **Macro-Economic Stability:**
- The government's focus on ensuring **macroeconomic stability** is credited for India's transformation from a **'fragile five' to a 'top five' economy.**
  - Macroeconomic Stability describes a national economy that has minimised vulnerability to external shocks, which in turn increases its prospects for sustained growth.
  - It acts as a **buffer against currency and interest fluctuations** in the global market.
    - Exposure to currency fluctuations, large debt burdens, and unmanaged inflation can cause **economic crises and a collapse in Gross Domestic Product (GDP).**

➤ **Impressive Export Figures:**
- **India's exports** witnessed substantial growth, surging **to over USD 775 billion,** showcasing the nation's economic resilience.

➤ **Foreign Direct Investment (FDI) Surge:**
- **FDI** flows doubled, contributing to India's economic strength.
- India stood at USD 45.15 billion in 2014-2015 and have since consecutively reached record FDI inflows for eight years. The year **2021-22 recorded the highest ever FDI at USD 83.6 billion.**
  - During FY 2022-23, FDI inflow of USD 71 billion (provisional figure) has been reported.

➤ **Khadi and Village Industries Boom:**
- Sales of **Khadi and Village Industries** products quadrupled from the **financial year 2013-14 to the financial year 2022-23**, reflecting the success of initiatives supporting indigenous industries.

➤ **Income Tax Returns Soar:**
- The number of people filing **income tax returns** increased significantly from about 3.25 crore in the assessment year (AY**)** 2013-14 to **approximately 8.25 crore in the A.Y. 2023-2024.**

➤ **Robust Forex Reserves:**
- The President announced that **India's forex reserves** now exceed USD 600 billion, underscoring the nation's financial stability.

➤ **PM-Kisan Samman Nidhi Scheme:**
- Under **PM-Kisan Samman Nidhi Yojana** farmers received over **Rs 2.8 lakh crore**, emphasising the government's commitment to supporting agricultural livelihoods.

➤ **Loans for Farmers:**
- Over the past decade, there has been a **threefold increase in easy loans for farmers from banks,** contributing to the financial well-being of the farming community.

➤ **Pradhan Mantri Fasal Bima Yojana Success:**
- The President highlighted the success of the **Pradhan Mantri Fasal Bima Yojana,** where farmers paid a premium of **Rs 30,000 crore and received a substantial claim of Rs 1.5 lakh crore.**

➤ **Ram Temple Construction:**
- The President highlighted the historic occasion of the **construction of the Ram Temple in Ayodhya.**
  - Emphasized that the centuries-old aspiration to build the temple had become a reality, symbolizing a **cultural milestone for the nation.**
- The President noted the role of the government in **promoting heritage tourism,** citing the significant turnout of 13 lakh devotees during the five days of consecration ceremonies in Ayodhya.

CBSE to Introduce Credit System

Why in News?

The **Central Board of Secondary Education (CBSE)** is planning significant changes to the academic framework of Classes 9, 10, 11, and 12 as part of its plan to implement **creditisation** , recommended by the **National Education Policy (NEP), 2020.**

➤ This move aims to revolutionise the education landscape by introducing a **unified framework** that bridges the gap between vocational and general education.

What is the Credit System?

➤ **About:** The credit system is a method used in education to **quantify and assess the amount of learning** a student has acquired.

○ It assigns **numerical values, known as credits**, to different courses or learning activities based on the time and effort required to complete them and demonstrate mastery of the subject matter.

➤ **Aims of Creditisation as per NEP 2020:** Creditisation aims to **establish academic equivalence between vocational and general education**, facilitating mobility between the two education systems, as proposed by the NEP 2020.

○ To implement this, the **University Grants Commission,** the higher education regulator, had come up with the **National Credit Framework (NCrF) in 2022.**

➤ **NCrF**: It is a unified credit framework for the **integration of training and skill development** into schools and higher education.

○ The credits earned by a student will be digitally stored in the **Academic Bank of Credits** and accessible through a **linked Digilocker** account.

○ To implement this in its affiliated schools, the CBSE formed a subcommittee in 2022 that suggested how the current academic framework should be redesigned to align it with NCrF.

What Changes did the CBSE Subcommittee Propose?

➤ **Notional Learning**: An academic year would comprise **1,200 notional learning hours**, equating to **40 credits for students.**

○ Notional learning refers to the **stipulated time an average student requires** to achieve specified outcomes.

○ Subjects are allocated specific hours to ensure a total of 1,200 learning hours per year for students to pass.

➤ **Curriculum Structure for Classes 9 and 10:** In Classes 9 and 10, students are required to complete **10 subjects**: **three languages and seven core subjects.**

○ Of the three languages**, at least two must be Indian languages** (e.g., Hindi, Sanskrit, or English).

○ The seven core subjects include math and computational thinking, social science, science, art education, physical education and well-being, vocational education, and environmental education.

➤ **Curriculum Structure for Classes 11 and 12**: For Classes 11 and 12, students should study **six subjects**: **two languages and four subjects** with **an optional fifth.**

○ At least **one language must be Indian.**

What are Micro-Credentials?

➤ **About:** Micro-credentials are brief learning activities with validated specific learning outcomes, offered through online, physical, or hybrid modes at various levels: **beginning, intermediate, or advanced.**

○ They **cater to lifelong learners**, including working professionals, who may not pursue formal degree programs.

➤ **Providers and Usage:** Various entities such as Atingi, Coursera, edX, and others offer micro-credentials. Many **universities globally are involved in providing them,** with an expectation of more organisations joining this trend.

➤ **Comparison with Formal Degrees:** Micro-credentials differ from macro-credentials like **undergraduate degrees**, which require several years of study.

○ While formal degrees use **'credits'** based on time spent in lectures, labs, etc., **micro-credentials assign credit based on acquiring defined competencies.**

➤ **Potential:** With the NEP 2020 focusing on skill-based education and employers seeking skilled employees, there is **increasing demand for micro-credentials in India.**

○ Indian **Higher education institutes (HEIs)** should **consider integrating them into their programs**, harmonising them with existing academic frameworks.

What are the Other Major Features of NEP 2020?

➤ **About:** The NEP 2020 aims at making **"India a global knowledge superpower".** It is only the 3**rd major revamp of the framework of education** in India since independence.

○ The two earlier education policies were brought in **1968 and 1986**.

➤ **Major Features:**

○ **Universal Access and Quality Education:** It aims to ensure universal access to education **from pre-primary to Grade 12.**

● Quality early childhood care and education for children aged 3-6 are emphasised.

○ **New Curricular and Pedagogical Structure:** Introduces a new structure of 5+3+3+4.

● Promotes **integration between arts and sciences,** curricular and extracurricular activities, and vocational and academic streams.

Note:

- **Assessment Reforms and Equity:** Establishes the **National Assessment Centre, PARAKH.**
  - It calls for a separate **Gender Inclusion fund** and Special Education Zones for disadvantaged regions and groups.
- **Technological Integration:** Establishes the **National Educational Technology Forum (NETF)** for technology integration.
- **Financial Investment and Coordination**: Aims to increase public investment in the **education sector to 6% of GDP.**
  - Strengthens the **Central Advisory Board of Education** for coordination and quality focus.
  - It also advocates for '**Light but Tight**' regulation.
- **Gross Enrolment Ratio(GER) Targets:** Aims to increase **GER to 100%** in **preschool to secondary level by 2030.**
  - Targets **GER in Higher Education**, including vocational education, to **reach 50% by 2035.**
  - Proposes holistic and multidisciplinary education with **multiple entry/exit options.**
- Major Initiatives Taken Under NEP 2020:
  - **PM Schools for Rising India (PM-SHRI)**
  - **NIPUN Bharat Mission**
  - **PM e-VIDYA Initiative**
  - **NISHTHA Program**
  - **National Digital Education Architecture (NDEAR)**

Finances of Panchayati Raj Institutions

Why in News?

The recently released report titled *'Finances of Panchayati Raj Institutions'* by the **Reserve Bank of India (RBI)** for the fiscal year 2022-23 sheds light on the financial dynamics of **Panchayati Raj Institutions (PRIs) in India.**

What are the Key Highlights of the Report?

- **Revenue Composition:**
  - Panchayats **earn only 1% of their revenue through taxes.**
  - Majority of their revenue comes from **grants provided by the Centre and the States.**
    - Data indicates that 80% of the revenue is from Central government grants, while 15% is from State government grants.

- **Revenue Statistics:**
  - In the fiscal year 2022-23, panchayats recorded a total revenue of Rs 35,354 crore.
    - Only Rs 737 crore was generated through their **own tax revenue.** Panchayats can earn this through **taxes** on profession and trades, land revenue, stamps and registration fees, taxes on property, and service tax.
    - **Non-tax revenue amounted** to Rs 1,494 crore, primarily from interest payments and Panchayati Raj programs.
  - Significantly, panchayats received Rs 24,699 crore in grants from the Central government and Rs 8,148 crore from State governments.
- **Revenue Per Panchayat:**
  - On an average each panchayat earned just Rs 21,000 from its own tax revenue and Rs 73,000 from non-tax revenue.
  - Conversely, grants from the Central government amounted to approximately Rs 17 lakh per panchayat, with State government grants totaling over Rs 3.25 lakh per panchayat.
- **State Revenue Share and Inter-State Disparities:**
  - Panchayats' share in their respective State's own revenue remains minimal.
    - For example, in **Andhra Pradesh, revenue receipts of panchayats form just 0.1%** of the State's own revenue, while in **Uttar Pradesh, it forms 2.5%, the highest among states.**
  - There are wide variations among states regarding average revenue earned per panchayat.
    - **Kerala and West Bengal lead with average revenues** of over Rs 60 lakh and Rs 57 lakh per panchayat, respectively.
    - The revenue was over Rs 30 lakh per panchayat in Assam, Bihar, Karnataka, Odisha, Sikkim, and Tamil Nadu.
    - States like Andhra Pradesh, Haryana, Mizoram, Punjab, and Uttarakhand have significantly **lower average revenues,** less than Rs 6 lakh per panchayat.
- **Recommendations of RBI:**
  - The RBI suggests promoting **greater decentralization and empowering local leaders and officials.** It advocates for measures to enhance financial autonomy and sustainability of Panchayati Raj.

Note:

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○ The report emphasised that PRIs can enhance resource utilisation by **adopting transparent budgeting, fiscal discipline,** community involvement in development prioritisation, staff training, and rigorous monitoring and evaluation.

○ Additionally, it highlighted the **necessity of raising public awareness** about PRI functions and encouraging citizen participation for effective local governance.

Chart 1| *The chart shows the revenue receipts of panchayats in 2022-23. Figures in %*
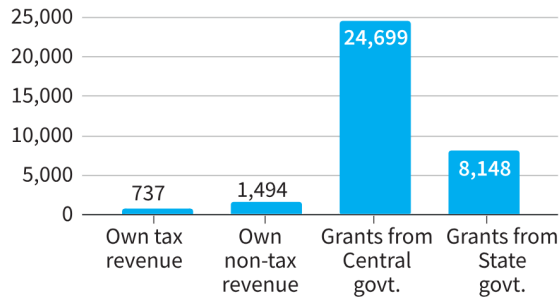
Chart 2 | *The chart shows the average revenue per panchayat in 2022-23. Figures in ₹ thousand*
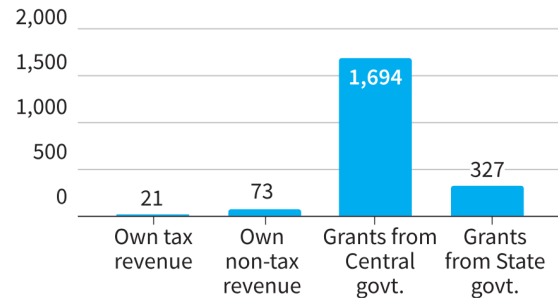
Chart 3 | *The chart shows the revenue per panchayat in percentage terms in 2022-23.*
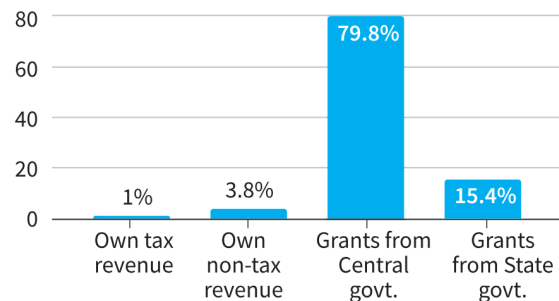
Chart 4 | *The chart shows the average revenue per panchayat across States in 2022-23. Figures in ₹ lakh.*
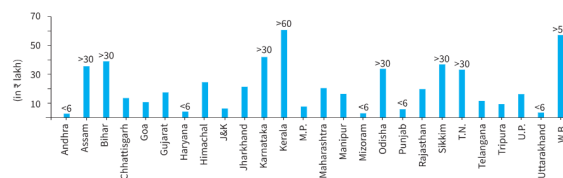
Chart 5 | *The chart shows the revenue of panchayats as a share of the State's own revenue in 2022-2023. Figures in %.*
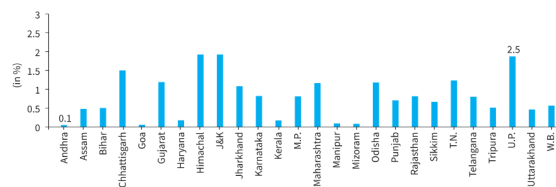
Why do Panchayats Face Funding Related Issues?

● **Limited Taxation:**
  ○ The PRI have **limited powers in respect of imposing cesses and taxes.** They have very little funds doled out to them by the State Government. Further, they are generally reluctant to raise necessary funds due to the fear of losing popularity with the masses.

➤ **Low Capacity and Utilization:**
  ○ PRI's **may lack the capacity and skills** to generate their own revenue from various sources, such as fees, tolls, rents, etc.

Note:

❍ They also face challenges in utilising the funds efficiently and effectively, due to poor planning, monitoring, and accountability mechanisms.

➢ **Fiscal Decentralisation Issues:**
   ❍ Insufficient devolution of **financial powers and functions from higher levels** of government to panchayats hampers their ability to mobilise resources independently. Limited fiscal decentralisation **undermines local governance and community empowerment.**

What are the Repercussions of Panchayats' Financial Dependence?

➢ Dependence on **external funding leads to interference from higher tiers of government.**

➢ Delayed release of funds by State governments forces **panchayats to use private funds.**

➢ Some regions have also reported non-receipt of funds under key schemes, impacting their functioning.
   ❍ The **Standing Committee on Rural Development and Panchayati Raj in March, 2023** said that **19 out of 34 State/UTs did not receive any funds** under the **Rashtriya Gram Swaraj Abhiyan scheme in FY23.**

What is a Panchayati Raj Institution?

➢ The **73ʳᵈ Constitutional Amendment Act, 1992** gave **constitutional status** to the Panchayati Raj Institutions (PRIs) and established a system of uniform structure (three tiers of PRIs), **elections**, reservation of seats for **Scheduled Caste, Scheduled Tribes** and women and **devolution of fund, functions and functionaries to PRIs.**
   ❍ **Panchayats act on three levels:** gram sabhas (village or group of small villages), panchayat samithis (block council), and zila parishads (district).

➢ **Article 243G** of the Constitution of India gives state legislatures the power to **provide Panchayats with the authority and powers** to function as self-government institutions.

➢ For financial empowerment of Panchayats, provisions have been made in terms of **Article 243H, Article 280(3)(bb) and Article 243-I** of the Constitution.
   ❍ Article 243H gives state legislatures the **power to authorize Panchayats to levy, collect, and appropriate taxes**, duties, tolls, and fees. It also allows them to assign these taxes, duties, tolls, and fees to Panchayats, subject to conditions and limits.

❍ Article 280(3) (bb), it shall be the duty of the Central Finance Commission to make recommendations to the President as to the measures needed to augment the **Consolidated Fund of a State to supplement the resources of the Panchayats** in the State on the basis of the recommendations made by the Finance Commission of the State.

❍ Article 243-I mandates the formation of state finance commissions every five years by the Governor. These commissions are tasked with **reviewing the financial status of panchayats and advising the Governor on:**
   ● Principles guiding the distribution of taxes, duties, tolls, and fees between the state and panchayats, including their respective shares and allocation among different levels of panchayats.
   ● Measures to improve panchayats' financial position.
   ● Any other finance-related matters referred by the Governor.

➢ The **Ministry of Panchayati Raj** looks into all matters relating to the Panchayati Raj and Panchayati Raj Institutions. It was created in May 2004.

Delimitation

Why in News?

The **Delimitation** of constituencies for the **Lok Sabha** and State Legislative Assemblies is to be carried out on the basis of the **First Census after 2026.**

➢ The 2021 Census was originally postponed due to the **Covid-19 pandemic** and subsequently due to delays on the part of the Central government.

What is Delimitation?

➢ **About:**
   ❍ Delimitation means the **process of fixing the number of seats and boundaries** of territorial constituencies in each State for the Lok Sabha and Legislative assemblies.
   ● It also includes determining the seats to be reserved for **Scheduled Castes (SC) and Scheduled Tribes (ST)** in these houses.
   ❍ This 'delimitation process' is performed **by the 'Delimitation Commission'** that is set up under an act of Parliament.

Note:

- Delimitation Commissions have been set up four times — **1952, 1963, 1973 and 2002** under the Acts of 1952, 1962, 1972 and 2002.
  - The first delimitation exercise was carried out by the President (with the help of the Election Commission) in 1950-51.

➢ **History:**
  ○ The last delimitation exercise that **changed the state-wise composition of the Lok Sabha** was completed in 1976 and done on the basis of the 1971 census.
  ○ The **Constitution of India** mandates that the allocation of seats in the Lok Sabha should be based on the population of each state so that the **ratio of seats to population is as close as possible to being equal across all states.** It is intended to ensure that each person's vote carries roughly the same weight, regardless of which state they live in.
    - However, this provision meant that states that took little intersst in population control could end up with a greater number of seats in Parliament.
  ○ To avoid these consequences, the **Constitution was amended 42nd Amendment** Act of 1976 **froze the allocation of seats** in the Lok Sabha to the states and the division of each state into territorial constituencies till the year 2000 at the 1971 level.
  ○ The **84th Amendment Act of 2001** empowered the government to **undertake readjustment** and rationalisation of territorial constituencies in the states on the basis of the population figures of 1991 census.
  ○ The **87th Amendment Act of 2003** provided for the delimitation of constituencies **on the basis of 2001** census and not 1991 census.
    - However, this can be done without altering the number of seats allotted to each state in the Lok Sabha.

➢ **Constitutional Provisions:**
  ○ Under **Article 82**, the Parliament enacts a **Delimitation Act after every Census.**
  ○ Under **Article 170**, States also get divided into territorial constituencies as per Delimitation Act after every Census.

What is the Significance of Delimitation?

➢ **Representation:**
  ○ Delimitation ensures fair representation in the Lok Sabha and State Legislative Assemblies by adjusting the **number of seats based on population changes.**
  ○ This is crucial for upholding the **democratic principle of "one citizen-one vote-one value."**

➢ **Equity:**
  ○ By readjusting the **boundaries of territorial constituencies**, delimitation aims to ensure **equitable distribution of seats** among different regions, considering population shifts over time.
  ○ This helps prevent underrepresentation or overrepresentation of specific areas.

➢ **Reserved Seats for SC/ST:**
  ○ Delimitation determines the allocation of reserved seats for **Scheduled Castes (SC) and Scheduled Tribes (ST)** in accordance with constitutional provisions, ensuring adequate political representation for marginalized communities.

➢ **Federalism:**
  ○ Delimitation impacts federal principles by influencing the distribution of political power among states. It is essential to **strike a balance between population-based representation and federal considerations** to maintain harmony among diverse regions.

➢ **Population Control Measures:**
  ○ Historically, the freezing of seats based on the **1971 Census aimed to incentivize population control** measures. However, the impending delimitation exercise raises questions about the effectiveness and implications of this policy in the context of changing demographics.

What are the Concerns Related to Delimitation?

➢ **Regional Disparity:**
  ○ Disparity in representation **between north and southern part of India** in the Lok sabha due to population as a deciding factor.
  ○ The delimitation based solely on population disregards the progress made by the southern states in population control and may lead to disparities in the federal structure.
    - Despite having **only 18% of the country's population**, the southern states **contribute 35% to the country's GDP.**
  ○ The northern states, which did not prioritise population control, are expected to benefit in the delimitation process due to their higher population growth.

Note:

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➢ **Inadequate Funding:**
  ❍ After the **15th Finance Commission used the 2011 Census** as a basis for its recommendation, concerns were raised about **southern states losing funding** and representation in parliament.
  ❍ Previously, the **1971 Census was** used as the base for funding and tax devolution **recommendations to states**.
➢ **Affecting the Reservations for SCs/ STs:**
  ❍ The scheduled delimitation and reallocation of seats may result in **not only a loss of seats for southern states** but also an increase in power for political parties with their base of support in the north.
    ● This could potentially lead to a shift of power toward the north and away from the south.
  ❍ The exercise will also affect the division of seats reserved for the Scheduled Castes and Scheduled Tribes in each state **(under Articles 330 and 332)**.

Table 1: If the number of seats is retained at 543 and reapportioned among States based on the projected population in 2026

State	Number of seats at present	Number of seats projected	Net gain/ loss
U.P.	80	91	11
Bihar	40	50	10
Rajasthan	25	31	6
M.P.	29	33	4
Tamil Nadu	39	31	-8
Andhra + Telangana	42	34	-8
Kerala	20	12	-8
Karnataka	28	26	-2
Punjab	13	12	-1
Himachal	4	3	-1
Uttarakhand	5	4	-1

Table 2: If the number of seats is increased to 848 based on the projected population in 2026

State	Number of seats at present	Number of seats projected	Net gain
U.P.	80	143	63
Bihar	40	79	39
Rajasthan	25	50	25
M.P.	29	52	23
Tamil Nadu	39	49	10
Andhra + Telangana	42	54	12
Kerala	20	20	-
Karnataka	28	41	13
Punjab	13	18	5
Himachal	4	4	-
Uttarakhand	5	7	2

What are the International Practices Related to Delimitation?

➢ **In the US:**
  ❍ The number of **seats in the House of Representatives** (the equivalent of our Lok Sabha) has been **capped at 435 since 1913**.
  ❍ The **population of the country has increased almost four times** from 9.4 crore in 1911 to an estimated 33.4 crore in 2023. The seats among the **States are redistributed after every Census through the 'method of equal proportion'**. This does not result in any significant gain or loss for any of the States.
    ● For example, based on the Census of 2020, the reapportionment has resulted in no change in the number of seats for 37 States.
➢ **European Union (EU):**
  ❍ In the EU Parliament which consists of 720 members, the number of seats is **divided between 27 member countries based on the principle of 'degressive proportionality'.**

○ Under this principle, the ratio of population to the number of seats shall increase as the population increases.

- For example, **Denmark** with a population of around 60 lakh has 15 seats (**average population of 4 lakh per member**) as against **Germany** with a population of 8.3 crore having 96 seats (**average population of 8.6 lakh per member**).

What is the Delimitation Commission?

➢ **Appointment:**

○ The Commission is appointed by the **President** of India and works in collaboration with the **Election Commission of India**.

➢ **Composition:**

○ Retired **Supreme Court** judge

○ **Chief Election Commissioner**

○ Respective **State Election Commissioners**

➢ **Functions:**

○ To **determine the number and boundaries of constituencies** to make the population of all constituencies nearly equal.

○ To identify seats reserved for **Scheduled Castes and Scheduled Tribes**, wherever their population is relatively large.

➢ **Powers:**

○ In **case of a difference of opinion** among members of the Commission, the **opinion of the majority prevails.**

○ The Delimitation Commission in India is a high-power body **whose orders have the force of law and cannot be called in question before any court.**

Safeguarding Personally Identifiable Information

Why in News?

Recently, the **Ministry of Corporate Affairs** fixed a critical vulnerability in its online portal after a cybersecurity researcher reported it to the **Computer Emergency Response Team of India (CERT-In).**

➢ The vulnerability reportedly exposed **Personally Identifiable Information (PII)** like **Aadhaar, Permanent Account Number (PAN), Voter identity,** date of birth, contact number, and communication address of more than 98 lakh directors of Indian companies.

What is Personally Identifiable Information (PII)?

➢ **About:**

○ PII is any **data or information maintained by an organisation or agency** that can potentially be **used to identify a specific individual.**

- This could include information such as **Aadhaar, PAN, voter identity, passport, date of birth, contact number,** communication address, and biometric information.

○ The constituents of PII vary depending on an **individual's home country.**

➢ **Types of PII:**

○ PII comes in two types: **direct identifiers and indirect identifiers.**

- **Direct identifiers are unique to a person** and include things like a passport number or driver's license number.

  ■ A single direct identifier is typically enough to determine someone's identity.

- **Indirect identifiers are not unique.** They include more general personal details like race and place of birth. While **a single indirect identifier can't identify a person, a combination can.**

➢ **Sensitive vs. Non-sensitive PII:**

○ Among PII, some pieces of information are more sensitive than others.

○ **Sensitive PII:**

- It is sensitive information that **directly identifies an individual and could cause significant harm** if leaked or stolen.

- **Sensitive PII is typically not publicly available**, and most existing **data privacy laws require organizations** to safeguard it by encrypting it, controlling who accesses it, or taking other cybersecurity measures.

○ **Non-sensitive PII:**

- It is personal data that, in **isolation, would not cause significant harm to a person if leaked or stolen.**

  ■ It **may or may not be unique to a person.**

- For example, a **social media handle would be non-sensitive PII.** It could identify someone, but a malicious actor couldn't commit identity theft armed with only a social media account name.

- This also includes information such as **zip code, race, gender, and religion.** They cannot be used to accurately identify an individual.

Note:

➢ **Non PII:**
  ○ **Non-personally identifiable information (non-PII)** is data that cannot be **used on its own to trace, or identify a person.** However, non-PII in tandem with **additional information can be used to identify an individual.**
    ● Non-PII information includes photographic images (especially of the face or other identifying characteristics), place of birth, religion, geographic indicators, employment information, educational qualifications, and medical records.

What are the Risks of PII Exposure?

➢ **Identity Theft:**
  ○ PII exposure increases the risk of identity theft, where criminals use stolen personal information to impersonate individuals for fraudulent activities.
  ○ **Cyberattacks and weaknesses in digital infrastructure** can lead to the exposure of citizens' PII.

➢ **Financial Fraud:**
  ○ Exposed PII, such as **bank account numbers or credit card information,** can lead to **financial fraud.**
    ● Criminals may access bank accounts, make unauthorized transactions, commit payment fraud, and **siphon funds from accounts allotted to beneficiaries** of government **welfare programmes,** resulting in **financial loss for the victim.**

➢ **Privacy Violations:**
  ○ PII exposure can **violate privacy,** compromising individuals' **confidentiality and autonomy.**
    ● Unauthorized access to personal information can result in **stalking, harassment, or intrusion into individuals' private lives.**

➢ **Phishing and Social Engineering Attacks:**
  ○ Cybercriminals may use exposed PII to conduct **phishing attacks,** tricking **individuals into disclosing further sensitive information** or clicking on malicious links.
    ● Social engineering attacks, such as impersonation scams or pretexting, exploit exposed PII to manipulate individuals into **revealing confidential data or granting unauthorized access.**

➢ **Data Breach Fallout:**
  ○ PII exposure often occurs through **data breaches,** leading to significant financial losses, remediation costs, and damage to the organization's reputation.

● Organizations may suffer from diminished customer trust, decreased revenue, and increased scrutiny from regulators and stakeholders.

➢ **Reputation Damage:**
  ○ Exposure of sensitive PII, such as compromising photos or personal messages, can damage individuals' reputations and relationships.
    ● Information leaked online may be used for **blackmail**, **extortion**, **or public humiliation,** leading to social and professional consequences.

Instances of Data Breach in Past:

➢ **CoWIN Data Breach Allegations:**
  ○ Reports emerged about a **Telegram bot** returning the **personal data of Indian citizens registered** on the **CoWIN portal.**
    ● A similar data breach was reported when an **American cybersecurity company** claimed the **PII of 815 million Indian citizens**, including Aadhaar numbers and passport details, were being sold on the dark web.
    ● The Indian government denied allegations of biometric data leaks and CoWIN portal breaches and stated that the CoWIN website is safe and has adequate safeguards for data privacy.

➢ **Aadhaar:**
  ○ Aadhaar data leaks were also reported in 2018, 2019, and 2022, with three instances of **large-scale leaks being reported,** including one in which farmer's data stored on the **PM Kisan website was made available on the dark web.**

➢ **RailYatri Platform Data Breach:**
  ○ A data breach was also reported in the RailYatri platform in January 2023.

➢ **Increase in Cyberattacks on Government and Essential Services:**
  ○ Additionally, 67% of Indian government and essential services organisations experienced over a **50% increase in disruptive cyberattacks**, a report from Resecurity (an American cybersecurity company) said.
  ○ Furthermore, a survey of 200 IT decision-makers noted that **45% of Indian businesses experienced more than a 50% increase in cyberattacks.**

Provisions Related to Data Governance in India:

➢ **Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules 2021.**

➢ **Justice K. S. Puttaswamy (Retd) vs Union of India 2017.**

➢ **Digital Personal Data Protection Act, 2023:**

Note:

○ Regulates the **processing of personal data in India.** The act applies to both online and offline data collection and processing, including activities outside India if they involve offering goods or services in India.

➢ **Computer Emergency Response Team - India (CERT-In):**

○ In the **Information Technology Amendment Act 2008**, CERT-In has been designated to **serve as the national agency** to perform several functions in the **area of cyber security: Collection, analysis and dissemination of information on cyber incidents** also issue alerts on cybersecurity incidents.

● It is an organisation of the **Ministry of Electronics and Information Technology.**

● **CERT-In's objectives include:** Preventing cyber attacks against the country's cyberspace, Responding to cyber attacks and minimizing damage and recovery.

What are the Challenges in Protecting PII?

➢ **Diverse Sources:**

○ PII may be **stored and processed across multiple locations** due to the growth of **cloud computing and SaaS services.**

➢ **Increasing Data Volume:**

○ The amount of sensitive data stored in **public clouds is projected to double by 2024,** posing challenges in ensuring its security.

➢ **Evolving Threat Landscape:**

○ Cybercriminals employ various techniques, including **social engineering attacks** and **purchasing data** on the dark web, to steal PII.

➢ **Complex Regulatory Environment:**

○ Organizations must navigate different **data privacy regulations and tailor their protection measures accordingly.**

Constitution (J&K) ST Order (Amendment) Bill, 2024

Why in News?

Recently, the Lok Sabha has passed the **Constitution (Jammu and Kashmir) Scheduled Tribes Order (Amendment) Bill, 2024**, aiming to include specific ethnic groups and tribes from Jammu and Kashmir into the list of **Scheduled Tribes.**

➢ The Union government has also introduced the **Jammu and Kashmir Local Bodies Laws (Amendment) Bill, 2024** to provide reservation to **Other Backward Classes (OBCs)** in panchayats and **Municipal Bodies** of Jammu and Kashmir.

What is the Constitution (Jammu and Kashmir) Scheduled Tribes Order (Amendment) Bill, 2024?

➢ **About:**

○ The bill particularly focuses on including **four ethnic groups** in the list of **Scheduled Tribes (STs)** in Jammu and Kashmir.

○ The **ethnic groups are** Gadda Brahmin, Koli, Paddari Tribe, and Pahari Ethnic Group".

○ By extending Scheduled Tribe status to these communities, the bill intends to **ensure their socio-economic and political empowerment.**

➢ **Significance:**

○ The bill ensures that the reservations for these existing communities such as **Gujjars and Bakarwals remain unaffected** while providing new reservations for the newly listed STs.

● Gujjars and Bakarwals are **nomadic — they migrate with their livestock to the higher reaches in the summer**, and return before the onset of winter.

○ The bill is seen as a significant step towards inclusive development in Jammu and Kashmir, aligning with the government's commitment to the holistic development of all sections and communities under the **"Sabka Sath, Sabka Vishwas" (Together with All, Trust of All) mantra**.

Earlier Status of Paharis

➢ The Paharis got **4% reservation in jobs** and educational institutions in 2019.

➢ Also in 2019, the *Justice (retd) G D Sharma Commission* was appointed to identify groups that were socially, educationally, and economically backward.

○ The Commission in its report **recommended ST status for Gadda Brahmins, Kolis, Paddari Tribe**, and Pahari Ethnic Group.

Note:

What are the Key Features of Jammu and Kashmir Local Bodies Laws (Amendment) Bill, 2024?

➢ **Amendment of Certain Provisions:** The bill aims to amend certain provisions of the J&K Panchayati Raj Act, 1989, the J&K Municipal Act, 2000, and the J&K Municipal Corporation Act, 2000 **to provide reservation to OBCs in Local Bodies** (panchayats and municipalities) in the Union Territory of Jammu and Kashmir.

➢ **Alignment with Constitutional Provisions:** The proposed amendments seek to bring **consistency in the laws** with the provisions of the Constitution, particularly **Part IX and Part IXA**, which relate **to Panchayats and Municipalities.**

 ❍ This includes providing reservation for backward classes of citizens in Panchayats and Municipalities, **as empowered by Clause (6) of Articles 243D and 243T of the Constitution.**

➢ **Superintendence of Elections:** The bill addresses inconsistencies regarding the superintendence, direction, and **control of the preparation of electoral rolls** and the conduct of elections to Panchayats and Municipalities.

 ❍ It ensures that the provisions regarding the **State Election Commission** are in line with the Constitution, specifically **Articles 243K and 243ZA.**

➢ **Removal of State Election Commissioner:** The bill seeks to rectify the variance between the provisions of the J&K Panchayati Raj Act, 1989, and the Constitution concerning the removal of the State Election Commissioner.

 ❍ It aims to align the **removal process with the constitutional provisions,** ensuring that the State Election Commissioner can **only be removed under circumstances similar to those of a Judge of a High Court.**

What are the Constitutional Provisions and Initiatives related to Tribes in India?

➢ **Constitutional Provisions:**

 ❍ As per **Census-1931, Schedule tribes are termed as "backward tribes"** living in the "Excluded" and "Partially Excluded" areas. The **Government of India Act, 1935** called for the first time for representatives of "backward tribes" in provincial assemblies.

 ❍ The **Constitution does not define the criteria for recognition of Scheduled Tribes** and hence the definition contained in 1931 Census was used in the initial years after independence.

 ❍ However, **Article 366(25) of the Constitution only provides process to define Scheduled Tribes**: "Scheduled Tribes means such tribes or tribal communities or parts of or groups within such tribes or tribal communities as are deemed under **Article 342 to be Scheduled Tribes for the purposes of this Constitution."**

 ● 342(1): The President may with respect to any State or Union Territory, after consultation with the Governor, by a public notification, specify the **tribes or tribal communities or part of or groups** within tribes or tribal communities as **Scheduled Tribe** in relation to that State or Union Territory.

 ❍ The **Fifth Schedule of the Constitution** lays out provision for Administration and Control of **Scheduled Areas and Scheduled Tribes** in states other than Assam, Meghalaya, Tripura and Mizoram.

 ❍ The **Sixth Schedule** deals with the administration of the tribal areas in Assam, Meghalaya, Tripura and Mizoram.

➢ **Legal Provisions:**

 ❍ **Scheduled Castes and the Scheduled Tribes (Prevention of Atrocities) Act, 1989.**

 ❍ **Provisions of the Panchayats (Extension to the Scheduled Areas) Act, 1996.**

 ❍ **Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.**

 ❍ **Protection of Civil Rights Act, 1955:**

 ● It prescribes punishment for the **preaching and practice of Untouchability** for the enforcement of any disability arising therefrom and for matters connected therewith.

➢ **Related Initiatives:**

 ❍ **TRIFED**

 ❍ **Digital Transformation of Tribal Schools**

 ❍ **Development of PVTGs**

 ❍ **Pradhan Mantri Van Dhan Yojana**

➢ **Related Committees:**

 ❍ **Xaxa Committee (2013)**

 ❍ **Bhuria Commission (2002-2004):** It recommended the **recognition of more tribal communities as ST**, thereby extending various benefits and protections to these marginalized groups.

Note:

- **Lokur Committee (1965):** Its **recommendations** included **measures to safeguard tribal land rights**, improve access to education, healthcare, and employment opportunities for ST communities, and enhance tribal welfare schemes to address their **Socio-Economic Challenges.**

Diamond Jubilee of the Supreme Court

Why in News?

Recently, the **Supreme Court of India (SC)** held its **Diamond Jubilee Celebration (75th anniversary)** at the Supreme Court Auditorium in Delhi. It also coincides with the 75th anniversary of the **Indian Constitution.**

- The event witnessed the launch of several **citizen-centric information and technology initiatives** aimed at enhancing judicial accessibility and transparency.

What are the Major Highlights of the Event?

➢ Digital initiatives, including the **Digital Supreme Court Reports (Digi SCR) and Digital Courts 2.0 and a revamped SC website** were launched as a part of the event.

- ❍ The **Digital Supreme Court Reports (Digi SCR)** initiative aims **to provide free, electronic access to Supreme Court judgments** since **1950**, fostering transparency and accessibility.
- ❍ **Digital Courts 2.0**, leveraging **AI for real-time transcription of court proceedings,** represents a significant leap towards efficient record-keeping and judicial processes.
- ❍ The revamped Supreme Court website, **available in bilingual format (English and Hindi),** offers a user-friendly interface for seamless access to judicial information.

➢ Efforts to enhance accessibility to justice, **particularly in remote areas,** were emphasised, with a focus on expanding the reach of the Supreme Court.

➢ Investments in physical infrastructure, such as the **expansion of the Supreme Court Building Complex,** were also highlighted as crucial steps towards bolstering judicial efficiency.

What are the Key Points Related to the Supreme Court?

➢ **Establishment:** On the **28th January 1950,** two days after India became a **Sovereign Democratic Republic,** the Supreme Court came into being.

- ❍ It succeeded the **Federal Court of India**, established under the **Government of India Act of 1935.**
- ❍ However, the jurisdiction of the Supreme Court is greater than that of its predecessor because it also **replaced the British Privy Council** as the highest court of appeal.

➢ **Constitutional Provisions: Articles 124 to 147 in Part V** of the Constitution deal with the **organization, independence, jurisdiction, powers, procedures** and so on of the Supreme Court.

- ❍ The Parliament is also authorised to regulate them**.**

➢ **Current Composition:** The Supreme Court of India **consists of 34 judges including the Chief Justice of India,** all appointed by the President of India.

- ❍ The original Constitution of 1950 envisaged a Supreme Court with a **Chief Justice and 7 puisne Judges**, leaving it to Parliament to increase this number.

➢ **Appointment:** The **President appoints the Chief Justice of India** after consulting with select judges from the Supreme Court and High Courts.

- ❍ Other judges are appointed by the President after consulting with the Chief Justice and additional judges from the Supreme Court and High Courts.
- ❍ **Consultation with the Chief Justice of India is mandatory** for the appointment of any judge other than the Chief Justice of India.

➢ **Eligibility Criteria for Appointment:** To qualify as a Supreme Court Judge, a person must be an Indian citizen.

- ❍ Additionally, they must have served as a **Judge in a High Court for at least five years consecutively**, or as an **Advocate in a High Court for at least ten years consecutively**, or be recognized as a **distinguished jurist by the President.**
- ❍ However, the Constitution has **not prescribed a minimum age for appointment as a judge** of the Supreme Court.
  - They **retire upon reaching the age of 65 years.**
  - Post-retirement, **Judges are prohibited from practicing** in any court or before any authority in India.

➢ **Removal of Judges:** A judge of the Supreme Court can be removed from his office by an **order of the President.**

Note:

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○ The President can **issue the removal order only after an address by Parliament** has been presented to him **in the same session** for such removal.

○ The address must be supported by a **special majority** of each House of Parliament i.e., by a **majority vote of two-thirds of members present and voting,** on grounds of **proven misbehavior or incapacity.**

➢ **Language of Proceedings and Regulation:** Proceedings in the Supreme Court are conducted exclusively in **English**.

○ **Supreme Court Rules, 1966, and Supreme Court Rules 2013** are framed under **Article 145** of the Constitution to govern the practice and procedure of the Supreme Court.

W R I T S

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TYPE OF WRIT	PURPOSE	CAN BE ISSUED AGAINST	CAN'T BE ISSUED AGAINST
Habeas Corpus	Direct the release of a person detained unlawfully	A. Public authorities B. Private individuals	A. Lawful detention B. Proceeding concerns contempt of court/legislature C. Detention outside the court's jurisdiction
Mandamus	Direct a public authority to do its duty	A. Public body B. Corporation C. An inferior court D. Tribunal E. Govt	A. Pvt. individual/body B. A discretionary duty C. Contractual obligation D. President, Governor E. CJI, CJ of HC acting in Judicial capacity
Quo Warranto	Direct a person to vacate an office assumed wrongfully	Only against judicial/quasi-judicial authorities	Administrative, legislative and pvt bodies and individuals
Prohibition	Prohibit a lower court from proceeding on a case	Judicial, quasi-judicial and admin. authorities	Legislative and pvt bodies and individuals
Certiorari	A higher court removes a proceeding from lower court & bring it before itself	Only a statutory/ constitutional public office	A. Ministerial office B. Pvt office

CONSTITUTIONAL PROVISIONS

⋈ **Article 32:**
- SC can issue writs
- Parliament can empower any other court to issue writs (however, no such provision exists till now)

  Under Article 32, the SC is constituted as a defender and guarantor of the fundamental rights

⋈ **Article 226:**
- HCs can issue writs

  Before 1950, only the HCs of Calcutta, Bombay and Madras had power to issue writs

WRIT JURISDICTION

CHARACTERISTICS	SUPREME COURT	HIGH COURT
Purpose of Issuing Writs	Only to enforce Fundamental rights	To enforce legal as well as Fundamental rights
Writ can be issued against a person/govt	Located anywhere throughout the territory of India	Located only within its territorial jurisdiction or if action arises within its territorial jurisdiction
Right to refuse exercising writ jurisdiction	N/A because Article 32 is an FR itself	May refuse; as a remedy under Article 226 is discretionary

➢ **Independence of Supreme Court:**

○ **Fixed Service Conditions:** Parliament determines judges' salaries, allowances, and other benefits, ensuring stability in service conditions unless altered during a **financial emergency.**

- Salaries, allowances, and administrative costs are **charged on the Consolidated Fund,** making them **non-votable by Parliament**, thereby ensuring financial independence.

○ **Conduct Immunity:** Parliament and State Legislatures are barred from discussing judges' conduct, except during impeachment proceedings **(Article 121).**

Note:

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○ **Contempt Power:** The Supreme Court has the authority to punish contempt, ensuring respect for its decisions and authority **(Articles 129).**

○ **Staff Appointment Autonomy:** The Chief Justice of India has the **freedom to appoint Supreme Court staff** and set their service conditions, free from executive interference.

○ **Jurisdiction Protection:** Parliament cannot curtail the Supreme Court's jurisdiction, although it can extend it.

○ **Separation from Executive:** The Constitution mandates the **separation of the judiciary from the executive** in public services, eliminating executive influence in judicial matters upon implementation **(Article 50)**.

➤ **Significance of the Supreme Court:**

○ **Guardian of the Constitution:** The Supreme Court safeguards the Constitution, ensuring its supremacy and protecting **fundamental rights** by issuing writs under **Article 32.**

○ **Upholding Rule of Law:** It acts as the **final arbiter of legal disputes**, interpreting laws and ensuring their just application through the **power of Judicial Review.**

○ **Social Justice and Human Rights**: The court plays a vital role in promoting social justice, protecting marginalised communities, and upholding human rights..

○ **Checking Executive Overreach**: It serves as a **check on the executive branch,** ensuring its actions are within the ambit of the law.

What are the Major Issues Related to the Supreme Court?

➤ **Pendency of Cases:** One of the perennial challenges facing the Supreme Court is the **backlog of cases.** Despite efforts to increase efficiency, the sheer volume of cases continues to strain the court's resources.

Pending Civil Cases	63042	Pending Criminal Cases	17174	Total Pending Cases	80216
Less Than 1 Year Old: 18051		Less Than 1 Year Old: 6960		Less than 1 year old: 25011	
28.63% < 1 Year old		40.53% < 1 Year old		31.18% < 1 Year old	

➤ **Judicial Activism vs. Judicial Restraint:** There's an ongoing debate surrounding the appropriate role of the judiciary, with discussions **on whether the Supreme Court should be more proactive in addressing social and political issues** or exercise restraint and limit intervention.

➤ **Concerns of Appointment of Judges:** The process of judicial appointments, particularly the role of the **Collegium system,** has been a topic of contention. There have been discussions on reforms like the **National Judicial Appointment Commission** to make the appointment process more transparent and accountable.

➤ **Technology and Access to Justice**: While initiatives like **e-filing and virtual hearings** have been implemented to improve access to justice, **challenges remain in ensuring equitable access, particularly for marginalised communities** with limited access to technology.

➤ **Inadequate Women Representation in SC:** At the moment, **only three of the Supreme Court's total judges are women.** This reflects the skewed representation of women in the legal system.

Public Examinations (Prevention of Unfair Means) Bill, 2024

Why in News?

Recently, the **Public Examinations (Prevention of Unfair Means) Bill, 2024**, has been introduced in **Lok Sabha,** aiming to prevent **"Unfair Means"** in order to "bring greater transparency, fairness and credibility to the **Public Examinations System.**

Note:

➢ The Bill, once it becomes law, will also serve the important function of being "a model draft for States to adopt at their discretion".

What is the Need for Such a Bill?

➢ **Instances of Question Paper Leaks:**
  ○ There have been a **very large number of cases of question paper leaks** in recruitment exams across the country in recent years.
    ● At least **48 instances of paper leaks in 16 states over the last five years**, in which the process of hiring for government jobs was disrupted.
    ● The leaks touched the lives of at least 1.51 crore applicants for about 1.2 lakh posts.

➢ **Malpractices Lead to Delay in Examinations:**
  ○ Malpractices in public examinations **lead to delays and cancellation of examinations**, adversely impacting the prospects of millions of youth.

○ At present, there is **no specific substantive law to deal with unfair means** adopted or offenses committed.

○ **Identifying and effectively addressing elements that exploit vulnerabilities** within the examination system is crucial through comprehensive central legislation.

➢ **To Bring Greater Transparency:**
  ○ The objective of the **Bill is to bring greater transparency, fairness and credibility** to the public examination systems and **to reassure the youth that their sincere and genuine efforts** will be fairly rewarded and their future is safe.

  ○ The Bill is aimed at **effectively and legally deterring persons, organised groups or institutions that indulge in various unfair means** and adversely impact the public examination systems for monetary or wrongful gains.

15 states, leaks in 41 job-recruitment exams

■ Exams ■ Posts ■ Candidates

J&K
■ 3
■ 2,330
■ 2,49,000

HARYANA
■ 2
■ 6,980
■ 8,41,000

RAJASTHAN
■ 7
■ 40,590
■ 38,41,000

GUJARAT
■ 3
■ 5,260
■ 16,41,000

MAHARASHTRA
■ 2
■ 6,560
■ 11,25,000

KARNATAKA
■ 2
■ 1,660
■ 3,34,000

UTTARAKHAND
■ 4
■ 1,800
■ 2,37,000

UTTAR PRADESH
■ 1
■ 3,300
■ 19,00,000

MADHYA PRADESH
■ 5
■ 3,690
■ 1,64,000

TELANGANA
■ 5
■ 3,770
■ 6,74,000

ARUNACHAL PRADESH
■ 1
■ 30
■ 4,000

ASSAM
■ 1
■ 590
■ 66,000

JHARKHAND
■ 1
■ 2,010
■ 6,50,000

BIHAR
■ 3
■ 24,380
■ 22,87,000

ODISHA
■ 1
■ 1,000
■ 5,000

Figures are estimates based on data collected from states in the last five years

Note:

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What are the Key Provisions of the Bill?

➤ **Defines Public Examination:**

○ **Under Section 2(k)**, a **Public Examination** is defined as any examination **conducted by a "public examination authority"** listed in the Schedule of the Bill, or any such other authority as may be notified by the Central Government.

● The schedule lists **five public examination authorities,** Union Public Service Commission (UPSC), the Staff Selection Commission (SSC), the Railway Recruitment Boards (RRBs), the Institute of Banking Personnel Selection (IBPS), the National Testing Agency (NTA).

■ NTA conducts the JEE (Main), NEET-UG, UGC-NET, the Common University Entrance Test (CUET)

○ Apart from these designated public examination authorities, all "Ministries or Departments of the Central Government and their attached and subordinate offices for recruitment of staff" **will also come under the purview of the new law.**

● The central government can add new authorities in the schedule through a notification as and when required.

➤ **Punishments:**

○ **Section 9 of the Bill** states that all **offences shall be cognizable, non-bailable, and non-compoundable.**

● In **cognizable offences,** police has a duty to investigate the case without seeking permission from the Magistrate.

● A **non-compoundable offence** is one in which the **case cannot be withdrawn by the complainant even when the complainant and the accused have reached a compromise,** and a trial must necessarily follow.

■ It means that an **arrest can be made without a warrant** and bail will not be a matter of right; rather, a magistrate will determine whether the accused is fit to be released on bail.

○ **Punishment** for "any person or persons resorting to unfair means and offences" can be **three to five years in prison, and a fine up to Rs 10 lakh**.

○ If the convict fails to pay the fine, "an additional punishment of imprisonment shall be imposed, as per the provisions of the **Bharatiya Nyay Sanhita, 2023**.

○ **Punishment for the Service Providers:**

● A **service provider, engaged by the public examination authority** for the conduct of examinations, shall also be **liable to be punished with imposition of a fine up to Rs 1 crore** and proportionate cost of examination shall also be recovered from it, **if the service provider is involved in illegal practices.**

➤ **Defines Unfair Means:**

○ **Section 3 of the Bill lists** at least 15 actions that amount to using unfair means in public examinations for monetary or wrongful gain.

● These acts include: leakage of question paper or answer key or part thereof and taking possession of question paper or an **Optical Mark Recognition (OMR)** response sheet without authority, providing solution to questions by any unauthorised person during a public examination.

○ The section also lists **tampering with any document necessary** for short-listing of candidates or finalising the merit or rank of a candidate; tampering with the computer network or computer system; creation of fake website and issuance of fake admit cards or offer letters to cheat or for monetary gain as illegal acts.

➤ **Investigation and Enforcement:**

○ The bill mandates that offenses under the proposed law will be investigated by **officers not below the rank of Deputy Superintendent of Police** or Assistant Commissioner of Police.

➤ **Model Draft for States:**

○ The bill **also serves as a model draft for states to adopt at their discretion,** with the aim of assisting states in preventing criminal elements from disrupting the conduct of their state-level public examinations.

➤ **High Level National Technical Committee:**

○ Formation of a High-Level National Technical Committee on Public Examinations.

● This committee will focus on developing protocols to secure digital platforms. It will devise strategies for implementing foolproof IT security systems.

● The committee will formulate national standards and service levels for both IT and physical infrastructure. These standards will be deployed for the conduct of examinations to ensure efficiency and reliability.

Note:

What are the Concerns Related to the Bill?

➢ **Discretion of State Governments:**
- ○ While the bill aims to **serve as a model for states to adopt**, the discretion given to state governments may lead t**o variations in implementation across different states.**
  - This could **potentially weaken the effectiveness of the law** in preventing unfair means in public examinations.

➢ **Exploitable Loopholes in Sanctions:**
- ○ The provisions of the bill, such as the punishment for offenders, may contain loopholes that can **be exploited to evade criminal sanctions**.
  - For example, if the **fine imposed on a service provider is not commensurate with the financial gains** they derive from unfair means, it may **not serve as a sufficient deterrent.**

➢ **Lack of Clarity on National Technical Committee:**
- ○ While the bill proposes the formation of a High-Level National Technical Committee on Public Examinations, there is a **lack of clarity regarding its composition, qualifications, and mandate.**
- ○ Without clear guidelines on the composition and qualifications of committee members, there may be **concerns** regarding their expertise and impartiality in **devising foolproof IT security systems and national standards for examination conduct.**

➢ **Potential for Legal Challenges:**
- ○ The bill may **face legal challenges related to its provisions on cognizability,** non-bailability, and non-compoundability of offenses. There **could be debates on whether such stringent measures are proportionate to the gravity of the offenses** and whether they **adhere to principles of natural justice.**

Rethinking India's Examination System

Why in News?

As examination season looms, the debate surrounding India's Examination system intensifies, highlighting its **shortcomings and proposing pathways for reform**.

What are the Issues Related to the Examination System in India?

➢ **School-Leaving Examinations leading and Lesser Secondary Education:**
- ○ The school-leaving examination was designed in the latter half of the 19th century as a way to determine who c**an be selected for further education**, which was very scarce at that time, and also for **lower-level jobs in offices.**
  - It was basically a means of elimination. And it has remained that way all the way up to now. The Grade 10 exam, for instance, fails a large number of c**hildren and stops them from going any further.**
- ○ This is a kind of structural arrangement in a system in which secondary education is not very widespread and **higher secondary education is even less so.** Opportunities for further education at the undergraduate level or various kinds of technical education are also relatively scarce.

➢ **Illusion of Equal Opportunity:**
- ○ It is in the exam that all children, irrespective of their background, **face the same test of three hours**.
- ○ The identity of paper-setters and evaluators is not revealed, thus, confidentiality enhances the **legitimacy of a situation where children from contrasting circumstances** are given an equal-looking opportunity.

➢ **Prioritizes Competition over Comprehension:**
- ○ India's Education system prioritises **competition over comprehension**, fostering a culture of rote **memorization rather than genuine understanding**.
- ○ Furthermore, the **structure of schools** and curricula exacerbates the problem, leaving scant room for exploration and holistic learning.

➢ **Intensely Competitive and Stressful:**
- ○ India's Examination system compares **very poorly with the evaluation and assessment systems** which are in place in other societies, including **European and North American societies as well as China.**
  - They have reformed their evaluation systems from within by improving teachers' understanding of what they are looking for in a child right from the start.
- ○ The Indian system right from the beginning becomes **intensely competitive and stressful** and starts promoting cramming as a way to move forward with high marks.

➢ **Poor Academic Infrastructure:**
- ○ Many of the **Boards don't have adequate staff,** enough academic faculty to monitor their own

procedures. Many of the State Boards are actually in very poor shape as far as their academic **infrastructure is concerned**.

○ Even the **CBSE (Central Board of School Education)** and **ICSE (Indian Certificate of Secondary Education)** operate as bureaucratic, mechanical set-ups, potentially compromising the quality of examination processes.

What can be Done to Reform India's Examination System?

➢ **Addressing Institutional Dysfunction:**
   ○ There is a need to **recognize and rectify the systemic inadequacie**s within examination boards, **including staffing shortages and infrastructure deficiencies.**
   ○ Prioritise the enhancement of academic faculty and administrative capabilities to ensure effective monitoring and evaluation processes.
   ○ There is a **need to foster a culture of transparency and accountability** within examination boards to uphold standards of integrity and fairness.

➢ **Comprehensive Curriculum Reform:**
   ○ Streamline and **rationalise the curriculum** to accommodate diverse learning needs and interests, while ensuring coherence and depth of content.
   ○ There is a **need to Emphasise the development of critical thinking,** problem-solving skills, and real-world application of **knowledge over rote memorization.**
   ○ Integrate **interdisciplinary approaches to learning** that promote holistic understanding and cross-cutting competencies.

➢ **Flexible Assessment Methods:**
   ○ There is a need to Introduce **modular examination formats** that allow students to demonstrate **proficiency in individual subjects over an extended period.**
   ○ Shift from high-stakes, one-size-fits-all examinations to **a more nuanced assessment framework** that values continuous learning and growth.
   ○ Provide **opportunities for formative assessment** and feedback throughout the learning process to facilitate personalized learning trajectories.

➢ **Professional Development for Educators:**
   ○ There is a **need to invest in comprehensive training** programs for educators to deepen their understanding of **pedagogical principles and assessment practices**.

○ Promote **collaboration and knowledge-sharing among teacher**s to foster a culture of continuous improvement and innovation.
○ Equip teachers with the tools and resources necessary to implement **learner-centred approaches and cater to diverse student needs effectively.**

➢ **Holistic Evaluation Criteria:**
   ○ Expand the **criteria for evaluating student performance** to encompass a broader **range of competencies**, including creativity, collaboration, and emotional intelligence.
   ○ Develop **alternative assessment methods, such as portfolios, projects, and presentations,** to capture the multifaceted nature of student achievement.
   ○ Encourage a **shift towards authentic, contextually relevant assessments** that reflect real-world challenges and opportunities.

➢ **Role of National Curriculum Framework for School Education 2023 (NCF):**
   ○ It aims to **help in positively transforming the school education system** of India a**s envisioned in NEP 2020,** through corresponding positive changes in the curriculum including pedagogy.
   ○ It aims **to realise the highest quality education for all children**, consistent with realizing an equitable, inclusive, and plural society as envisaged by the Constitution of India.

What Initiatives have been Taken to Reform the Education System?

➢ **Right To Education Act of 2009.**
➢ **New Education Policy 2020.**
➢ **Sarva Shiksha Abhiyan (SSA).**
➢ **Rashtriya Madhyamik Shiksha Abhiyan.**
➢ **Rashtriya Uchhattar Shiksha Abhiyan (RUSA).**
➢ **National Testing Agency (NTA)**
➢ **National Curriculum Framework.**

Mera Gaon, Meri Dharohar Programme

Why in News?

The Government of India has decided to **map and document all villages under the Mera Gaon, Meri Dharohar (MGMD) Programme.**

➤ The program seeks to compile comprehensive information detailing the life, history, and ethos of Indian villages and make it available to virtual and real-time visitors.

➤ The Ministry of Culture is also implementing a **Scheme of Financial Assistance for the Promotion of Art and Culture** consisting of 8 components through which cultural organisations are given **financial assistance for the promotion of art and culture.**

What is the Mera Gaon, Meri Dharohar (MGMD) Programme?

➤ The MGMD Programme is a national mission on cultural mapping conducted in coordination with **Indira Gandhi National Centre for the Arts (IGNCA)** under the **Ministry of Culture.**

   ○ A web portal on MGMD has also been launched. MGMD aims to compile comprehensive information about **Indian villages, covering aspects of life, history, and ethos, accessible to both virtual and real-time visitors.**

➤ Under the MGMD, information is **collected under seven broad categories:**

   ○ Arts and Crafts Village

   ○ Ecologically Oriented Village

   ○ Scholastic Village linked with Textual and Scriptural Traditions of India

   ○ Epic Village linked with Ramayana, Mahabharata and/or Puranic legends and oral epics

   ○ Historical Village linked with Local and National History

   ○ Architectural Heritage Village

   ○ Any other characteristic that may need highlighting such as fishing village, horticulture village, shepherding village etc.

➤ MGMD is a component of **National Mission on Cultural Mapping (NMCM),** undertaken as a part of **Azadi Ka Amrit Mahotsav (AKAM).**

➤ Under the MGMD **cultural mapping of 6.5 lakh villages is being carried out** and more than 2 Lakh villages have already been mapped and uploaded on the Mission portal that serves as the **National Cultural Work Place.**

What is the National Mission on Cultural Mapping (NMCM)?

➤ **About:**

   ○ NMCM has been set up by the Ministry of Culture, to **identify and document India's cultural heritage** and its creative potential to regenerate and revitalise rural economies, thereby **making Village India self-reliant.**

   ○ The Cultural Mapping will function at three levels:

      ● **National Directories** of artists and living human treasures of cultural industries.

      ● Creation of **National Digital Inventories/ Registers** of art expression and artist communities/bearers of tradition.

      ● Evolve **policies toward the preservation of art practices** and develop welfare schemes for their practitioners.

➤ **Mission Mandate:**

   ○ To create a national database through Cultural Mapping with the aid of extensive ground surveys and documentation.

   ○ To **Preserve, safeguard, revitalise and disseminate** the rich cultural heritage of this country for future generations.

   ○ To create a strong **"Cultural Vibrancy"** throughout the nation with the help of digital platforms and outreach activities.

What is the Scheme of Financial Assistance for the Promotion of Art and Culture?

➤ It is a **central sector scheme that** aims to support various cultural activities and organizations in the country. The scheme has **8 components,** each with a different objective and funding amount.

➤ The scheme for Financial Assistance for the Promotion of Art and Culture consists of 8 Components, they are:

   ○ **Financial Assistance to Cultural organizations with National Presence:**

      ● Provide financial support to reputed **cultural organizations with a national presence** to disseminate and propagate art & culture.

      ● This grant is given to such organizations that are properly constituted managing bodies **registered in India with an All India Character** and have adequate working strength and a track record of spending Rs. 1 crore or more during any 3 of the last 5 years on cultural activities.

      ● **Maximum Grant:** Up to Rs. 1 crore.

Note:

drishti

- ❍ **Cultural Function & Production Grant (CFPG):**
  - Provide financial support for **various cultural activities** including seminars, conferences, research, workshops, festivals, exhibitions, and productions.
  - **Maximum Grant:** Rs. 5 lakh, extendable up to Rs. 20 lakh under exceptional circumstances.
- ❍ Financial Assistance for the Preservation & Development of Cultural Heritage of the Himalayas:
  - Promote and preserve th**e cultural heritage of the Himalayas** through research, training, and dissemination.
  - **Funding:** Rs. 10 lakhs per year for an organization, extendable up to Rs. 30 lakhs in exceptional cases.
- ❍ Financial Assistance for the Preservation & Development of Buddhist/Tibetan Organisations:
  - Support voluntary **Buddhist/Tibetan organizations,** including **monasteries,** in propagating and developing Buddhist/Tibetan cultural traditions.
  - **Funding:** Rs. 30 lakhs per year for an organization, extendable up to Rs. 1 crore in exceptional cases.
- ❍ **Financial Assistance for Building Grants including Studio Theatres:**
  - Provide financial support for **creating cultural infrastructure** such as studio theatres, auditoriums, rehearsal halls, etc.
  - **Maximum Grant**: Up to Rs. 50 lakh in metro cities and up to Rs. 25 lakh in non-metro cities.
- ❍ **Financial Assistance For Allied Cultural Activities:**
  - Support organizations in creating assets to **enhance audio-visual spectacles for cultural activities** during festivals and major events.
  - **Maximum Assistance:** Audio: Rs. 1 crore, Audio+Video: Rs. 1.50 crore.
- ❍ **Scheme for Safeguarding the Intangible Cultural Heritage:**
  - This scheme was launched **by the Ministry of Culture in 2013** to safeguard the **intangible cultural heritage** and diverse cultural traditions of India through revitalization and promotion.
- ❍ **Domestic Festivals and Fairs:**
  - The objective of this scheme is to assist in holding the **'Rashtriya Sanskriti Mahotsavs'** organized by the Ministry of Culture.

Scheme Approved in Budget 2024-25

Why in News?

Recently, the Union cabinet has approved a slew of key economic decisions, including extension of various schemes such as Extension of Subsidised Sugar Scheme among others.

What are the Key Schemes Approved by the Union Government?

➢ **Extension of Subsidised Sugar Scheme:**
  - ❍ The Cabinet extended the scheme to distribute subsidised sugar to **Antyodya Anna Yojana (AAY)** families for two more years till 31st March 2026.
  - ❍ The Scheme facilitates **access to sugar to the poorest** of the poor and adds energy to their diet so that their health improves.
  - ❍ Under the Scheme, the Central Government gives subsidies of **Rs.18.50 per kg per month** of sugar to AAY families of participating States.
    - The approval is expected to extend benefits of more than Rs.1850 crore during the period of **the 15th Finance Commission (2020-21 to 2025-26).**
  - ❍ The Government of India is already giving free ration under **Pradhan Mantri Garib Kalyan Anna Yojna (PM-GKAY).**
    - Selling **'Bharat Atta,'** 'Bharat Dal,' tomatoes, and onions at affordable and fair prices are measures to ensure an adequate food supply for citizens, **extending beyond the PM-GKAY program**.
  - ❍ With this approval, the Government will continue giving subsidies to participating States for the distribution of sugar to AAY families through **PDS (Public Distribution System)** at the rate of One kg per family per month.
    - States have the responsibility to procure and distribute sugar.
➢ **Continuation of Scheme for Rebate of State and Central Taxes and Levies (RoSCTL) for export of Apparel/Garments:**
  - ❍ The Cabinet **approved the continuation of a scheme granting a rebate** on state and central taxes and levies for the export of apparel and garments up to 31st March 2026.

Note:

- The continuation of this scheme for two more years is expected **to provide a stable policy regime for long-term trade planning,** particularly in the textiles sector.
  - Other textile products not covered under the RoSCTL are eligible to avail benefits under **RoDTEP** along with other products.
- ➢ **Extension of Animal Husbandry Infrastructure Development Fund (AHIDF):**
  - The Cabinet approved an extension of the **AHIDF** to be implemented under the **Infrastructure Development Fund (IDF)** for another three years, **up to 2025-26**.
  - The scheme aims to incentivize **investments in dairy processing, product diversification, meat processing, animal feed plants**, and breed multiplication farms.
  - The AHIDF is a scheme aimed to promote and **incentivize investments in the animal husbandry sector** in India.
    - The Government of India will provide **3% interest subvention for 8 years with a two-year moratorium for loans** up to 90% from scheduled banks and other financial institutions.
- ➢ **Marketing Margin for Supply of Domestic Gas to Fertiliser Units:**
  - The Cabinet approved a formula for the **determination of marketing margin on the supply of domestic gas to Fertiliser (Urea)** units from 1st May 2009 to 17th November 2015.
  - This approval is a structural reform. Marketing Margin is charged by gas marketing companies **from consumers over and above the cost of gas** for taking on the additional risk and cost associated with marketing of gas.
    - Government had previously determined the marketing margin on supply of domestic gas to urea and **LPG producers in 2015.**
  - The approval will provide **additional capital to the various Fertilizer (Urea) Units** for the component of marketing margins paid by them on domestic gas procured between 2009 to 2015.
  - In line with government vision of **Aatma Nirbhar Bharat**, this approval will incentivize manufacturers to increase investment.

- The increased investment will lead to self-sufficiency in fertilizers, and provide an element of certainty for future investments in the gas infrastructure sector.

Uttarakhand's UCC Draft Report

Why in News?

Recently, the **Uniform Civil Code (UCC)** draft report was approved by the **Uttarakhand Cabinet** and is likely to be tabled in the state assembly on 6th February 2024, as a bill for enactment.

- ➢ The UCC drafting committee was led by retired **Supreme Court** judge Ranjana Prakash Desai.
- ➢ The UCC is a proposed **set of common laws for all residents of Uttarakhand,** regardless of their religion, caste, or gender.

> **Note: Article 162 of the Indian Constitution** indicates that the executive power of a State extends to matters with respect to which the Legislature of the State has power to make laws. In view of the provisions of **Entry 5 of the Concurrent List of the Seventh Schedule,** the constitution of a Committee to introduce and implement Uniform Civil Code (UCC) per se cannot be challenged as ultra vires.
> - **Entry 5 of the Concurrent List deals with "marriage and divorce; infants and minors; adoption; wills, intestacy**, and succession; joint family and partition; all matters in respect of which parties in judicial proceedings were immediately before the commencement of this Constitution subject to their personal law.
> - ➢ This implies that the **state government of Uttarakhand can enact UCC within its territory.**

What are the Key Highlights of Uttarakhand's UCC Draft Report?

- ➢ The UCC aims to replace distinct personal laws of every religion, focusing on marriage, divorce, adoption, and inheritance**, guided by Article 44 of the Constitution.**
  - Article 44 of the Indian Constitution is a **Directive Principle of State Policy (DPSP).** It states that the state should **try to establish a uniform civil code for all citizens throughout India.**
  - This code would be a **single set of personal laws** that would apply to all citizens, regardless of religion.

- ➢ Some of the key proposals put forth by the committee include the **prohibition of polygamy, halal, iddat** (a mandatory period of waiting to be observed by women following the dissolution of a Muslim marriage), **triple talaq**, and **child marriage**, uniform age for **girls' marriage across all religions,** and mandatory registration of **live-in relationships.**
- ➢ The draft UCC aims to focus on **gender equality by treating men and women equally** in matters such as **inheritance and marriage.**
  - ○ The Code is also likely to extend an **equal property share to Muslim women against the existing 25% share** accorded under **Muslim personal laws.**
  - ○ The minimum age for marriage for men and women is **set to remain the same,18 years for women and 21 years for men.**
- ➢ **Scheduled tribes (STs)** have been **exempted from the purview of the bill**. The tribal population in the state, which is around 3%, had been voicing its dissent against UCC in the wake of the special status accorded to them.

What are the Concerns Regarding the UCC Draft Report for Uttarakhand?

- ➢ The UCC draft report may **infringe upon the fundamental rights** of religious freedom and personal liberty guaranteed by the Constitution of India.
  - ○ Some critics argue that the UCC draft report does not respect the diversity and pluralism of India, and imposes a uniform code that may not suit the customs and practices of different communities.
- ➢ The UCC draft report may affect the rights and interests of the **STs of Uttarakhand**.
  - ○ Some activists claim that the **UCC draft report does not adequately address the issues and aspirations of the STs**, and may erode their cultural identity and autonomy.

What is the Uniform Civil Code?

- ➢ **About:**
  - ○ The UCC is mentioned in **Article 44 of the Constitution** as part of the **Directive Principles of State Policy,** that the state should work to establish a uniform civil code for all citizens across India.
    - However, the Constitution's framers left it to the government's discretion to implement the UCC.

- Goa is the only state in India with a UCC, following the Portuguese Civil Code of 1867.
- ➢ **Supreme Court of India Stance on UCC:**
  - ○ **Mohd. Ahmed Khan vs Shah Bano Begum Case,1985:**
    - The Court observed that "it is a matter of regret that **Article 44 has remained a dead letter"** and called for its implementation.
    - Such a demand was reiterated in subsequent cases such as *Sarla Mudgal v. Union of India, 1995*, and *John Vallamattom v. Union of India, 2003*.
  - ○ **Jose Paulo Coutinho v. Maria Luiza Valentina Pereira Case, 2019:**
    - The Court hailed **Goa as a "shining example" where "the uniform civil code is applicable to all**, regardless of religion except while protecting certain limited rights" and accordingly urged for its pan-India implementation.
- ➢ **Law Commission's Stance:**
  - ○ In 2018, the **21st Law Commission** headed by former Supreme Court judge Justice Balbir Singh Chauhan submitted a consultation paper on "Reforms of family law" wherein it observed that the **"formulation of a Uniform Civil Code is neither necessary nor desirable at this stage".**
    - It underscored that **secularism should coexist with the prevailing plurality in the country**. It however recommended that **discriminatory practices and stereotypes** within existing personal laws **should be amended.**
  - ○ Acknowledging the lapse of more than three years since the issuance of the initial consultation paper. In 2022, the **22nd Law Commission** headed by Justice (Retd) Rituraj Awasthi, issued a notification seeking opinions from various stakeholders, including the public and religious organisations, on the UCC.

UGC's Draft Guidelines on De-reservation

Why in News?

The **University Grants Commission's (UGC) draft guidelines** on implementing **reservations** in higher

education have sparked significant debate, largely due to the proposal of **'de-reservation' in certain exceptional cases.**

➤ In response, the Union government and the UGC have clarified that faculty positions in universities reserved for <u>**Scheduled Castes (SCs), Scheduled Tribes (STs), Other Backward Classes (OBCs)**</u>, and <u>**Economically Weaker Section (EWS)**</u> candidates will **not be opened to the general category.**

> **Note:** De-reservation refers to the **potential removal of reserved seats or quotas allocated to specific categories**, such as SCs, STs, OBCs and EWS.

What do the UGC Draft Guidelines Encompass?

➤ The UGC had tasked a committee, led by **Dr H S Rana**, the director of the Institute of Public Administration, to formulate new draft guidelines for implementing reservations in higher education, considering the changes and new government instructions since the 2006 guidelines.

○ The aim was to clarify existing rules and incorporate updates from **Department of Personnel and Training (DoPT)** circulars based on court orders.

➤ The draft encompasses various chapters covering aspects like **quotas in faculty posts, preparation of reservation rosters, de-reservation, verification of caste claims, and reservation in student admissions**.

➤ The **chapter on de-reservation** is at the centre of the debate, as it suggests that **reserved faculty positions could be dereserved in "exceptional cases"** with adequate justification from the university concerned.

○ The guidelines state that a vacancy reserved for SC/ST or OBC candidates **can be declared unreserved if enough candidates from these categories are not available.**

○ Proposals for de-reservation of Group A and Group B level jobs must be submitted to the **Education Ministry**, while Group C and D level posts require approval from the university's Executive Council.

Why did this De-reservation Chapter cause an Outcry?

➤ **Reasons for Protest:**

○ Contrary to **current academic practices**, where reserved **faculty positions are not converted for general candidates**, the draft guidelines appeared to pave the way for de-reservation in faculty positions leading to a public outcry.

● The controversy arose as this provision extended Group A posts to include Group B, C and D.

○ The Education Ministry officially maintains a ban on the de-reservation of reserved vacancies for SC, ST, and OBC in direct recruitment.

● Historically unfilled quota positions are **traditionally re-advertised, and special recruitment drives** are conducted until suitable candidates are identified.

○ This was seen as a violation of the constitutional mandate of reservation and a **threat to the representation and empowerment of the marginalised communities in higher education.**

➤ **UGC and Government's Reaction:**

○ In response to the public outcry, the Ministry of Education and UGC swiftly issued clarifications, emphasizing that there is **no new instruction permitting de-reservation.**

● The Ministry reiterated that the **Central Educational Institutions (CEI) Act, 2019, prohibits the de-reservation of reserved posts,** and all vacancies must be filled as per the 2019 Act.

○ UGC Chairman clarified that the guidelines were only in draft form, assuring that any provision related to de-reservation would not be part of the final document.

What is the University Grants Commission?

➤ The University Grants Commission (UGC) came into existence on 28th December, 1953 and became a **statutory Organization of the Government of India by an Act of Parliament in 1956**, for the coordination, determination and maintenance of standards of teaching, examination and research in university education.

➤ The UGC operates under the **Ministry of Education,** the Central Government appoints a Chairman, a Vice-Chairman, and ten other members to the UGC.

○ The Chairman is chosen from people **who are not officers of the Central Government or any State Government.**

➤ Apart from **providing grants** to eligible universities and colleges, the Commission also advises the Central and State Governments on the measures that are necessary for the development of Higher Education.

➤ It functions from **New Delhi** as well as its six Regional offices located in Bangalore, Bhopal, Guwahati, Hyderabad, Kolkata and Pune.

Note:

➤ It also regulates the recognition of fake universities, autonomous colleges, deemed to be universities and distance education institutions.

Constitutional Provisions Governing Reservation

➤ The Indian Constitution contains several provisions for reservation. **Part XVI deals with SC and ST reservations in Central and State legislatures.**

➤ Articles 15(4) and 16(4) enable the reservation of government service seats for SCs and STs.
  ○ The **Constitution 77th Amendment Act of 1995** introduced Article 16(4A) in the Indian Constitution, allowing the government to **implement reservation in promotions.**
  ○ Subsequently, the 85th Amendment Act of 2001 modified Article 16(4A) to provide **consequential seniority to SC and ST candidates** promoted through reservation.

➤ Article 16(4B) allows the state to fill unfilled SC/ST vacancies in the succeeding year, bypassing the 50% reservation cap.

➤ **Articles 330 and 332** provide specific representation for SCs and STs in Parliament and State Legislative Assemblies.

➤ Panchayats and Municipalities also have reservation provisions under **Articles 243D and 243T.**

Corruption Perception Index 2023

Why in News?

Recently, the **2023 Corruption Perceptions Index (CPI) 2023** has been released by **Transparency International** showing that most countries have made **little to no progress in tackling public sector corruption.**

➤ The CPI ranks 180 countries and territories around the globe by their perceived levels of public sector corruption, scoring on a scale of **0 (highly corrupt) to 100 (very clean).**
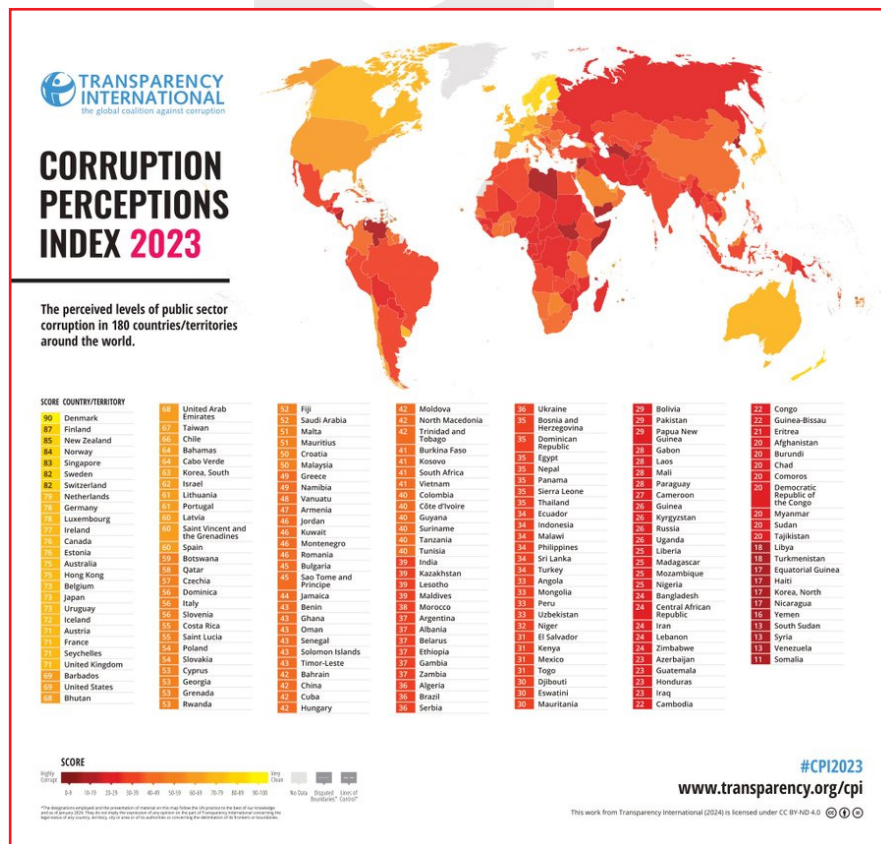
Note:

Transparency International
➢ It is an international non -governmental organisation founded in 1993 based in Berlin, Germany
➢ Its non-profit purpose is to take action to combat global Corruption with civil societal anti-corruption measures and to prevent criminal activities arising from corruption.
➢ Its most notable publications include the **Global Corruption Barometer and the Corruption Perception Index.**

What are the Key Highlights of the Corruption Perception Index (CPI) 2023?

➢ **Serious Corruption Globally:**
  ○ Over two-thirds of countries score **below 50 out of 100**, which strongly indicates that they have serious **Corruption** problems.
  ○ The global average score is **stuck at only 43**, while the vast majority of countries have made **no progress or declined in the last decade.**

➢ **Global Highlights of CPI 2023:**
  ○ **Top Three Countries: Denmark** with a score of 90 tops the index for the **sixth consecutive year**, with **Finland and New Zealand** following closely with scores of 87 and 85, respectively.
    ● Due to well-functioning justice systems, these countries are also among the top scorers in the Rule of Law Index.
  ○ **Bottom Spots:** Somalia, Venezuela, Syria, South Sudan and Yemen, with their **scores 11, 13, 13, 13** respectively, take the bottom spots in the index.
    ● They are all affected by protracted crises, mostly armed conflicts.
  ○ **India's Rank and Score:**
    ● India was ranked **93 out of 180 countries** on the CPI 2023.
    ● The overall score for India in **2023 was 39**, a **slight decrease from 40 in 2022.**
      ■ In 2022, India was ranked 85.

India's Corruption Perception Index score
2012 - 2023
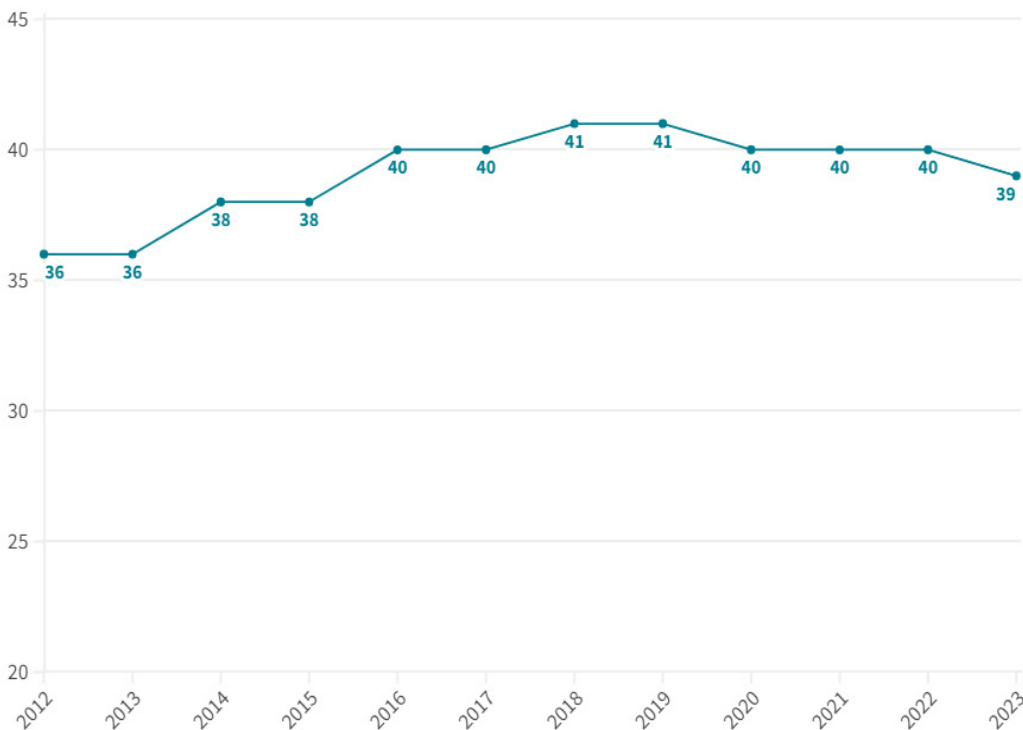
Source: www.transparency.org • The Hindu Graphics

Note:

- ➤ **Link with Access to Justice and Corruption:**
  - ○ According to the **Rule of Law Index**, the world is experiencing a decline in the functioning of justice systems.
    - The **Rule of Law Index** is published by the **World Justice Project (WJP),** an independent organization that works to advance the rule of law globally.
    - The index provides data on several dimensions of the rule of law, which are further broken down into 44 indicators.
  - ○ Countries with the lowest scores in the Rule of Law index are **also scoring very low on the CPI**, highlighting a clear connection between **access to justice and corruption.**
- ➤ **Factors Contributing to Corruption:**
  - ○ Both authoritarian and democratic leaders are undermining justice. This is increasing **impunity for corruption**, and even encouraging it by eliminating consequences for criminals.
  - ○ Corrupt acts like **bribery and abuse of power are also infiltrating** many courts and other Judicial institutions across the globe.
  - ○ Where corruption is the norm, vulnerable people have **restricted access to justice while** the rich and powerful capture whole justice systems, at the expense of the common good.
- ➤ **Key Recommendations:**
  - ○ Corruption will continue to thrive **until justice systems can punish wrongdoing** and keep governments in check. When corruption persists and justice is influenced by money or politics, it harms the general public.
  - ○ It is high time to **break the barriers and ensure people can access justice** effectively. Everyone deserves fair and inclusive legal systems where victims' voices are heard at every stage.

What is the State of Indian Neighbours in CPI 2023?

- ➤ **Pakistan and Sri Lanka:**
  - ○ Pakistan ranked 133 and Sri Lanka ranked 115 out of 180 countries.
  - ○ Both countries grappled with their **respective debt burdens** and political instability.
  - ○ However, both countries have **strong judicial oversight,** which helps to keep the government in check.

- The **Supreme Court of Pakistan strengthened citizens' right to information** by expanding this right under Article 19A of its Constitution to previously restricted institutions.
- ➤ **Bangladesh:**
  - ○ Bangladesh (ranked 149) emerges from the **Least Developed Country (LDC)** status, with economic growth supporting a **continued reduction in poverty** and improving living conditions.
  - ○ The flow of information on the public sector is **hindered amidst an ongoing crackdown against the press.**
- ➤ **China:**
  - ○ China (ranked 76) has its **aggressive anti-corruption crackdown** by punishing more than 3.7 million public officials for corruption over the last decade. In China public officials often use corruption as a way to drive up their income.
  - ○ However, the country's **heavy reliance on punishment rather than institutional checks** on power raises doubts over the long-term effectiveness of such anti-corruption measures.

What is Corruption?

- ➤ **About:**
  - ○ **Collusive Corruption:** This occurs when individuals **or entities conspire together to achieve dishonest** or fraudulent objectives. It involves a cooperative effort between parties, often for mutual benefit, to undermine the integrity of systems or processes.
  - ○ **Coercive Corruption:** In this form of corruption, individuals are compelled or **forced to engage in dishonest activities.**
    - Those who abuse their power may be individuals or they may belong to organizations, such as **businesses or governments.**
- ➤ **Reasons for Prevalence of Corruption in Public Service:**
  - ○ **Patronage:** Civil service positions being used as rewards for political support or exchanged for bribes can lead to widespread corruption.
    - When individuals are appointed based on **loyalty rather than merit,** it undermines the integrity of public institutions.
  - ○ **Wage Disparities:** Lower wages for civil servants compared to the private sector may create financial pressure. Some employees might resort to taking bribes as a means to offset the income disparity and meet their financial needs.

○ **Influence of Political Ideology:** Political ideology's impact can nurture a corruption-friendly environment, where rewarding supporters irrespective of qualifications undermines fairness and accountability.

● This can compel individuals to resort to corruption to obtain or retain positions, perpetuating an unethical cycle.

What are the Implications of Corruption?

➢ **On People and Public Life:**

○ **Lack of Quality in Services:** In a system with corruption, there is low or no quality of service.

● To demand quality, one might need to pay for it. This is seen in many areas like municipality, electricity, distribution of relief funds, etc.

○ **Lack of Proper Justice:** Corruption in the judiciary system leads to improper justice and victims of offense might suffer.

● A **crime may be proved as a benefit of the doubt due to a lack of evidence** or even the evidence erased.

● Due to corruption in the police system**, the investigation process has been going on for decades.**

○ **Loss of Opportunity and Denial of Timely Service:** Corruption not only inflicts financial and health-related challenges but **also leads to a loss of opportunities for individuals**.

● The denial of timely services, job opportunities, and fair access to resources perpetuates inequality and impedes societal progress.

➢ **On Society:**

○ **Distrust in Government:** Voters choose representatives based on trust, but if leaders are implicated in corruption, **people lose faith and may abstain from voting next time (Voter Apathy).**

○ **Discouraging Whistle-Blowing Activities:** In corruption prone environment, individuals are often **discouraged from engaging in whistle-blowing activities.**

● Fear of retaliation, social stigma, or lack of effective protection mechanisms hinders the exposure of corrupt practices.

○ **Normalisation of Corruption:** In societies where corrupt practices become normalised, individuals may **gradually accept such behavior as a routine part of public life**. It weakens ethical fabric, making it challenging to instigate meaningful reforms.

➢ **On Economy:**

○ **Lack of Ease of Doing Business:** Corruption often involves bribes and kickbacks, adding to the costs of doing business.

○ **A Decrease in Foreign Investment:** Corruption in government bodies has led to many foreign investments going back from developing countries.

○ **Lack of Development:** Many new industries willing to get started in a particular region change their plans if the region is unsuitable.

● If there are no proper roads, water, and electricity, the companies do not wish to start up there, which hinders the economic progress of that region.

○ **Red Tapism:** Red tapism refers to excessive bureaucratic procedures, complex regulations, and administrative delays, which can create an environment prone to corrupt practices

○ **Lack of Competition:** Corruption often leads to the manipulation of markets, favoring certain businesses or individuals. This can result in monopolies or oligopolies, limiting competition and stifling innovation.

○ **Prevalence of Black Money and Black Market:** Black money, which is income not declared to the government, results in reduced tax revenues.

● This limits the government's ability to fund essential public services and infrastructure projects.

● The existence of a large black market can undermine the formal economy, as legal businesses face unfair competition from those operating in the shadows.

What are the Indian Initiatives to Tackle Corruption?

➢ **The Indian Penal Code, 1860**

➢ **Prevention of Corruption Act, 1988**

➢ **The Prevention of Money Laundering Act, 2002**

➢ **The Foreign Contribution (Regulation) Act, 2010**

➢ **The Companies Act, 2013**

➢ **The Lokpal and Lokayuktas Act, 2013**

➢ **Central Vigilance Commission**

➢ **Centralised Public Grievance Redress and Monitoring System (CPGRAMS)**

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Economic Scenario

Highlights

- UPI Services in Sri Lanka and Mauritius
- Indian Oil Market Outlook to 2030: IEA
- India Becomes Net Exporter of Toys
- ASI Results for 2020-21 and 2021-22
- Blue Economy 2.0
- Fiscal Deficit and its Management
- Renewables 2023 Report of IEA

- Guidelines on State Guarantees on Borrowings
- China's Shifting Economic Landscape
- Economics of the Food System Transformation
- Interim Budget 2024-2025
- Hybrid Vehicles as Alternative to EVs
- IEA Report Electricity 2024

TECHNICAL TEXTILE

Technical or engineered textiles are defined as products, materials, and fibres that are used for functional rather than aesthetic purposes.

12 APPLICATION SEGMENTS

- Agrotech (horticulture)
- Buildtech (tarpaulins)
- Clothtech (shoelaces)
- Geotech (road infra)
- Hometech (mattress)
- Indutech (conveyor belts)
- Meditech (diapers)
- Mobiltech (airbags)
- Oekotech (water purification)
- Packtech (container systems)
- Protech (defence)
- Sportech (sports nets)
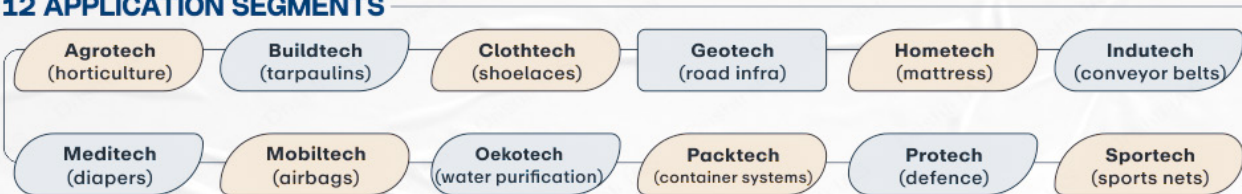
SIZE OF TECHNICAL TEXTILES MARKET
- Indian - USD 23 bn (2023)
- Global - USD 202.93 bn (2023)

EMPLOYMENT STATUS
- Contributes 2.3% to India's GDP
- 13% of industrial production, 12% export earnings

LEADING COUNTRIES
- China, US and Germany (60% of annual output)
- India - 5th largest producer (however, <2% share in global export market)

NATIONAL POLICIES AND SCHEMES
- National Technical Textiles Mission (NTTM)
- Technology Mission for Technical Textiles (TMTT)
- Technology Upgradation Fund Scheme (TUFS)
- Scheme for Integrated Textile Parks (SITP)
- PLI Scheme

FDI POLICY IN INDIA
- 100% FDI approved under automatic route
- Mauritius, Belgium - Top 2 FDI sources

OTHER INITIATIVES
- Textile Research Associations (TRAs)
- Centres of Excellence (COEs)
- Focus Incubation Centres

CHALLENGES FOR INDIA'S TECHNICAL TEXTILES INDUSTRY
- Inadequate production of High Performance Fibres
- Lack of entrepreneurship-culture and absence of skill-training
- Lack of globally-aligned quality standards
- Inadequate R&D facilities

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UPI Services in Sri Lanka and Mauritius

Why in News?

Recently, the Prime Minister of India along with the President of Sri Lanka, Mr Ranil Wickremesinghe and the Prime Minister of Mauritius, Mr Pravind Jugnauth jointly inaugurated the launch of **Unified Payment Interface (UPI) services in Sri Lanka and Mauritius**, and also **RuPay card** services in Mauritius.

➢ This move aims to facilitate seamless digital payments among citizens of the three countries, fostering stronger economic ties.

➢ These projects have been developed and executed by **NPCI International Payments Ltd (NIPL),** along with partner banks/non-banks from Mauritius and Sri Lanka, under the guidance and support of the **Reserve Bank of India.**

UPI goes global: Adoption in different countries

Jul-21	Aug-21	Sep-21	Sep-21	Nov-21
Bhutan Royal Monetary Authority of Bhutan	**Malaysia** Merchantrade Asia	**Singapore** Monetary Authory of Singapore, PayNow	**Singapore, Malaysia, Thailand, Philippines, Vietnam, Cambodia, Hong Kong, Taiwan, South Korea, Japan** Liquid Group (cross border digital payments provider)	**UAE** Network International

Oct-22	Aug-Sept 2022	Jun-22	Apr-22	Feb-22
Netherlands, Belgium, Luxemburg, Switzerland Worldline	**United Kingdom** Terra Pay, PayXpert	**France** Lyra Network	**UAE** Lulu Financials, Neopay (Mashreq Bank)	**Nepal** Gateway Payments Service, Manam Infotech

Oct-22	Oct-22	Apr-23	Jul-23
Oman Central Bank of Oman	**UAE** Central Bank of UAE	**London, UK** PPRO	**Sri Lanka** Lanka Pay

SOURCE India Briefing, media reports

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What are RuPay and UPI?

➢ **RuPay:**

○ **RuPay** is a payment system and financial services product developed by the **National Payments Corporation of India (NPCI)**.

○ It is a **domestic card payment network** that can be used at **automated teller machines (ATMs),** point of sale (POS) devices, and e-commerce websites across India.

○ The provision under the **Payment and Settlement Systems Act, 2007,** empowered the **Reserve Bank of India (RBI)** and the **Indian Banks' Association (IBA)** to create a secure electronic payment and settlement system in India.

○ RuPay has launched various card variants catering to the different segments of society.

● In addition to the Government scheme cards, RuPay Classic, Platinum & Select variant cards are designed for the masses and affluent customers.

○ After Nepal, **Bhutan**, **Singapore** and **UAE**, the RuPay card is now available in Africa through Mauritius, the **first non-Asian country to issue it.**

● The use of RuPay technology will allow banks in Mauritius to issue RuPay cards locally through the **Mauritius Central Automated Switch (MauCAS) card network.**

■ MauCAS is a novel state-of-the-art digital hub fully owned and operated by the Bank of Mauritius for routing payments among operators.

➢ **UPI:**

○ The **UPI** is a digital and real-time payment system developed by the NPCI in 2016.

○ UPI is built over the **IMPS (Immediate Payment Service) infrastructure** and allows users to instantly transfer money between any two parties' bank accounts.

○ UPI allows merging several banking features, seamless fund routing, and merchant payments into one mobile application.

○ **More than 100 billion transactions took place via UPI in 2023** worth Rs 2 lakh crores.

○ The countries that accept **UPI payments are France, UAE, Mauritius, Sri Lanka, Singapore, Bhutan, and Nepal.**

How will RuPay and UPI Benefit the Users in Mauritius and Sri Lanka?

➢ **Facilitating Seamless Transactions:**

○ Users in Mauritius and Sri Lanka will experience convenience in making transactions, both domestically and internationally, through the adoption of RuPay and UPI.

● With RuPay cards and UPI connectivity, individuals travelling between **India, Mauritius, and Sri Lanka can conduct transactions** seamlessly, eliminating the need for currency exchange and reducing transactional complexities.

➢ **Enhanced Financial Access:**

○ RuPay cards will be accepted at ATMs and PoS terminals in Mauritius, expanding the accessibility of digital payments for users in the region.

○ UPI connectivity in Sri Lanka enables users to make **QR code-based payments at merchant locations,** providing a convenient alternative to traditional payment methods.

➢ **Promotion of Financial Inclusion:**

○ The availability of RuPay cards and UPI services empowers individuals from diverse socio-economic backgrounds to **participate in the digital economy, fostering financial inclusion.**

○ UPI transactions offer a **cost-effective solution for users,** reducing the expenses associated with traditional banking services and facilitating affordable financial transactions.

➢ **Strengthened Economic Ties:**

○ Seamless payment solutions contribute to the growth of **trade and tourism between India, Mauritius, and Sri Lanka**, fostering economic cooperation and collaboration.

● Increased digital transactions support local businesses by promoting cashless transactions, enhancing transparency, and reducing reliance on cash-based transactions.

○ The launch of UPI and RuPay services will also strengthen the economic and strategic ties between the three countries, as part of **India's "neighbourhood first" policy** and **"SAGAR" (Security and Growth for All in the Region) vision**.

➢ **Innovation and Technological Advancement:**

○ The introduction of RuPay and UPI reflects a commitment to embracing digital innovation, positioning Mauritius and Sri Lanka as progressive economies in the global digital landscape.

Note:

- By leveraging advanced payment technologies, users gain access to innovative financial solutions that empower them to manage their finances more efficiently and securely.

India's Digital Public Infrastructure (DPI)

➢ India's DPI also known as the **India Stack,** is a set of **open and interoperable platforms** yet independent "blocks" that provide **identity, payment, data sharing, and consent mechanisms** for various digital applications.

➢ These platforms are built on the principles of **user-centric design, policy objectives, developing use cases, and engagement.**

➢ **Some of the key components of India's DPI are Aadhaar, DigiYatra, DigiLocker, and Account Aggregator (AA).**

➢ The DPI holds the promise of driving economic transformation and fostering inclusive growth. The modular layers of India Stack create opportunities for innovation, inclusion, and competition in the digital realm.

Indian Oil Market Outlook to 2030: IEA

Why in News?

Recently, the **International Energy Agency (IEA)** has released the *Indian oil market outlook to 2030 report*, which looks in-depth at how India's role on the global oil market may evolve over the period **through to 2030.**

➢ The Report looks at energy transition trends that may affect the demand for oil in different sectors and how these changes could impact the country's energy security.

What are the Key Highlights of the Report?

➢ **India's Dominance in Oil Demand Growth:**
  ○ India is projected to become the **largest source of global oil demand growth** between now and 2030, surpassing China by 2027.
  ○ India's oil demand is set to rise by **about 1.2 million barrels per day (bpd)** by 2023. This increase constitutes over a **third of the expected global demand growth of 3.2 million bpd** by 2030.
    - India's total oil demand projections will stand at 6.64 million bpd in 2030 against **5.48 million bpd in 2023.**

  ○ This growth is fueled by factors such as strong growth in its economy, population and demographics.

➢ **Growth in Fuel Demands:**
  ○ **Diesel/gasoil is identified as the single largest source of oil demand growth** in India, accounting for nearly half of the rise in the nation's demand and over one-sixth of total global oil demand growth through 2030.
  ○ **Jet-kerosene** demand is poised to grow strongly, at around 5.9% per year on average, but from a low base compared to other countries.
  ○ **India's petrol demand** is projected to grow by 0.7% on average, as the electrification of India's vehicle fleet avoids a more substantial rise.
  ○ **Gasoline demand** is projected to grow modestly due to the electrification of India's vehicle fleet. **LPG demand** is expected to increase due to investments in production facilities.

➢ **Crude Oil Imports:**
  ○ India's Crude oil imports are forecasted to rise by over a fourth to 5.8 million bpd by 2030 due to robust oil demand growth and declining domestic production. India currently depends on imports to meet over 85% of its oil requirement.
    - India **currently is the third largest consumer of crude oil** behind the US and China. The domestic consumption as per the oil ministry data is around **5 mb/d.**

➢ **Investment in Refining Sector:**
  ○ Indian oil companies are investing heavily in the refining sector to meet the rise in domestic oil demand.
  ○ Over the next seven years, **1 mb/d of new refinery distillation capacity** will be added – more than any other country in the world outside of China.
  ○ Several other large projects are currently under consideration that may lift capacity beyond the 6.8 mb/d capacity that we expect so far.

➢ **Role in Global Oil Markets:**
  ○ India is set to maintain its position as a key exporter of transportation fuels to markets in Asia and the Atlantic Basin.
  ○ India's role as a global swing supplier has risen **since 2022 as the loss of Russian product exports** to European markets has increased the pull of Asian diesel and jet fuel westward.

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- In 2023, India was the **fourth-largest exporter of middle distillates** globally and the sixth largest refinery product exporter at 1.2 mb/d.
- New refining capacity is forecast to boost product supplies to global markets to 1.4 mb/d through mid-decade before edging lower to 1.2 mb/d by 2030 given the steady rise in domestic demand.

➢ **Biofuels in Decarbonisation:**
- ❍ Biofuels are also expected to play a key role in India's decarbonisation of the transport sector.
  - India is already the **world's third-largest producer and consumer of ethanol**, as domestic production has tripled over the last five years.
- ❍ Supported by the country's abundant feedstocks, political support and effective policy implementation, its ethanol **blending rate of around 12% is amongst the world's highest**.
  - India has advanced by five years its deadline for doubling nationwide **ethanol blending in gasoline to 20% in Q4 2026.**
  - Achieving 20% ethanol blending in such a short time frame presents several challenges, not least rapidly expanding feedstock supplies.

Strategic Petroleum Reserves

SPR-I

GoI has set up 5.33 MMT of strategic crude oil storages in SPR Phase-I at following 3 locations:

| Vishakhapatmam, AP |
| Mangalore, Karnataka |
| Padur, Karnataka |

SPR-I has been commissioned and dedicated to the Nation in Feb' 2019

SPR-II

Another 6.5 MMT of strategic crude reserves is being planned in SPR-II at:

| Chandikhole, Odisha |
| Padur, Karnataka |

■ Existing Crude Oil Storage Capacity under SPR-I
- 1.33 MMT (Vishakhapatnam, AP)
- 1.5 MMT (Mangalore, Karnataka)
- 2.5 MMT (Padur, Karnataka)

Chandikhole
Vishakhapatnam
Padur
Mangalore

■ Upcoming Crude Oil Storage Capacity under SPR-II
- 4 MMT (Chandikole, Odisha)
- 2.5 MMT (Padur, Karnataka)

➢ **Efforts in Energy Transition:**
- ❍ Increased uptake in **Electric Vehicles** is set to play a key role in decarbonising the transport sector.
- ❍ It is estimated that combined, new EVs and energy efficiency improvements will avoid 480 kb/d of extra oil demand in the 2023-2030 period.
  - That means without these gains India's oil demand would reach a much higher 1.68 mb/d by 2030 compared with the current forecast.

➢ **Challenges:**
- ❍ Despite efforts to attract foreign upstream investment, domestic crude oil production is **expected to continue declining over the medium term** due to a dearth of new discoveries.
- ❍ India was already the world's second-largest crude oil net importer in 2023, having boosted imports by 36% over the past decade to 4.6 mb/d to meet rising refinery intake.

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❍ Increased refining processing will lift crude oil imports further, to 5.8 mb/d by 2030, with **major implications for India's security of supply.**

➢ **Recommendations:**

❍ India's current oil stock holding levels equate to **66 days of net-import cover**, with **Strategic Petroleum Reserve (SPR)** stocks of seven days.

● IEA member countries maintain a stockpile equivalent to 90 days of their demand.

● India is not a full member of the agency and has an associate member status.

❍ India needs to enhance its capacity to respond to possible oil supply disruptions by implementing and **strengthening its SPR Programmes** and improving oil industry readiness.

● Strategic petroleum reserves help mitigate the impact of emergencies like wars on energy supplies.

What are Strategic Petroleum Reserves?

➢ Strategic petroleum reserves (SPRs) are stockpiles of **crude oil** maintained by countries ensuring a stable supply of crude oil even during times of geopolitical uncertainty or supply disruptions.

➢ These underground storage facilities play **a crucial role in maintaining a steady flow of energy resources** for the nation's growth and development.

❍ India currently has a strategic crude oil reserve **capacity of 5.33 million tonnes.**

❍ More strategic reserves with a combined capacity to hold 6.5 million tonnes of crude oil will be built under the second phase of the country's strategic petroleum reserves programme.

What is the International Energy Agency?

➢ **About:**

❍ The **International Energy Agency (IEA)**, which has its headquarters in Paris, France was set up as an autonomous agency in **1974** by member countries of the **Organisation for Economic Cooperation and Development (OECD)** in response to the mid-1970s oil crisis.

❍ The IEA's main focus is on energy policies, which include economic development, energy security, and environmental protection.

❍ The IEA also plays a major role in providing information related to the international oil market and taking action against any physical disruptions in the supply of oil.

➢ **Members:**

❍ The IEA family is made up of 31 member countries, 13 association countries **including India**, and 4 accession countries.

● A candidate country to the IEA must be a member country of the OECD.

➢ **Major Reports:**

❍ **World Energy Outlook.**

❍ **World Energy Investment Report.**

❍ **India Energy Outlook Report.**

India Becomes Net Exporter of Toys

Why in News?

➢ Recently, The Indian toy industry exhibited remarkable growth, exports surged by **239%** and imports dropped by **52%** between **2014-15** and **2022-23** making India a net exporter.

❍ The toy industries are dealing with higher costs in China and struggling to find cheaper places to move their production.

What is the Status of India's Toy Industry?

➢ **Focus on the Toy Industry:**

❍ Policy discussions have spanned from the old **"permit license raj"** era to the current **'Make in India' initiative.**

❍ A study attributes the industry's recent success to **'Make in India' initiatives.**

➢ **Positive Shift in Trade Balance:**

❍ Trade balance was **negative Rs.1,500 crore** in **2014-15**, but turned **positive** from **2020-21**.

❍ **This shift can be attributed to:**

● Increased import duty from **20% to 60%** in **February 2020.**

● Non-tariff barriers are like Quality control order (QCO) and mandatory sample testing.

● COVID-19 disruptions Impacted imports globally.

❍ **Decline in Net Exports in 2022-23:**

● Despite high import duty, **net exports** fell from **Rs. 1,614 crore to Rs. 1,319 crore.**

● This decline is more significant for toys **(31%)** compared to all toys **(18%).**

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What led India to become a Net Exporter?

➢ **Tariff and Non-Tariff Barriers:** The increase in customs duty on toys from 20% to 60% in February 2020, and subsequently to 70% in March 2023, acted as a significant deterrent to toy imports.

  ○ Non-tariff barriers, such as the quality control order (QCO) and mandatory sample testing of each import consignment since January 2021, further restricted imports.

  ○ These measures aimed to reduce the demand for imported toys and protect the domestic industry.

➢ **Global Supply Chain Disruption:** The COVID-19 pandemic disrupted global supply chains in 2020-21, adversely affecting imports. As the global supply chain was restored in 2022-23, net exports reduced, indicating a correlation between supply chain disruptions and India's net export performance.

What are the Challenges?

➢ **Limited Domestic Productive Capabilities:** The analysis of data from the Annual Survey of Industries (ASI) indicates that there is hardly a steady rise in fixed capital per worker, gross value of output, and a decline in labor productivity.

  ○ This suggests that the domestic industry may not have experienced substantial improvement in its productive capabilities during the period under consideration (2014-15 to 2019-20).

➢ **Declining Labor Productivity:** There is a steady decline in labor productivity from ₹7.5 lakh per worker in 2014-15 to ₹5 lakh in 2019-20. This decline raises concerns about the efficiency and competitiveness of the industry, indicating potential challenges in enhancing productivity.

➢ **Foreign dependence for sourcing raw materials:** Indian manufacturers excel in producing board games, soft and plastic toys, puzzles, and similar products. However, to manufacture these items, companies often need to import materials from South Korea and Japan.

➢ **Lack of Technology:** It also seems to act as a barrier to the Indian toy industry. Most of the domestic toy manufacturers use outdated technology and machinery, which affects the quality and design of the toys.

➢ **High Tax Rates:** The toy industry in India faces challenges due to high GST rates. Currently, electronic toys are taxed at 18% GST, while non-electronic toys incur a 12% GST rate.

➢ **Cheap Alternatives:** The Indian toy industry faces competition from inexpensive and low-quality imports from countries such as China. China constitutes around 80% of toy imports into India, negatively impacting domestic toy manufacturers.

➢ **Unorganized and Fragmented:** The Indian toy industry remains largely fragmented, with 90% of the market being unorganised. This fragmentation makes it challenging to maximise the industry's potential benefits.

National Action Plan for Toys (NAPT)

The National Action Plan for Toys (NAPT) is a comprehensive plan launched by the Government of India in 2020 to promote the Indian toy industry, including traditional handicrafts and handmade toys, with the objective of establishing India as a global toy hub.

➢ The NAPT comprises 21 specific action points, coordinated by the Department for Promotion of Industry and Internal Trade (DPIIT) and implemented by multiple Central Ministries/Departments.

➢ The NAPT addresses various aspects such as design, quality control, innovation, marketing, e-commerce, skill development, and promotion of indigenous toy clusters.

ASI Results for 2020-21 and 2021-22

Why in News?

Recently, the **Ministry of Statistics and Programme Implementation (MoSPI)** released the results of the **Annual Survey of Industries (ASI)** for the reference periods of 2020-21 and 2021-22 referred to as **ASI 2020-21 and ASI 2021-22.**

What are the Key Highlights From the ASI 2020-21 and ASI 2021-22 Results?

➢ **Growth in Gross Value Added (GVA):**

  ○ **GVA** grew by **8.8% in the year 2020-21** over 2019-20, primarily due to a sharp fall in input (4.1%) that offset an output contraction (1.9%) during the pandemic.

  ○ In 2021-22, GVA surged significantly by **26.6% over the previous year,** riding on high growth in industrial output, which expanded by more than 35% in value terms.

○ The year 2021-22 witnessed a sharp rise in level as well as in the growth of the majority of the important economic parameters like **invested capital, input, output, GVA, net income and net profit registered by the sector** and even surpassed the pre-pandemic level in absolute value terms.

➢ **Key Industry Drivers:**

○ Industries such as Manufacture of **Basic Metal, Coke & Refined Petroleum Products**, Pharmaceutical Products, Motor vehicles, Food Products, and Chemical and Chemical products emerged as **major drivers of growth.**

● Together, these industries contributed about **56% of the total GVA of the sector,** with a GVA growth of 34.4% and output growth of 37.5% compared to 2020-21.

➢ **Regional Performance:**

○ **Gujarat remained at the top in terms of GVA in 2020-21** and second in 2021-22, while **Maharashtra ranked first in 2021-22** and second in 2020-21.

● **Tamil Nadu, Karnataka, and Uttar Pradesh** consistently maintained their positions among the top five states contributing to manufacturing GVA.

➢ **Employment Trends:**

○ Despite a **marginal fall in employment in 2020-21** due to the **pandemic,** 2021-22 saw robust growth of 7.0% year-on-year (Y-o-Y) in total estimated employment in the sector.

● The estimated number of persons engaged in the sector in 2021-22 exceeded pre-pandemic levels by **more than 9.35 lakh,** with the average salary per employee registering an **increase of 1.7% in 2020-21 and by 8.3% in 2021-22** in comparison to respective previous years.

○ **Tamil Nadu, Gujarat, Maharashtra, Uttar Pradesh, and Haryana** emerged as the **top five states employing the highest number of persons** in the manufacturing sector in both 2020-21 and 2021-22.

● Together, these states contributed about 54% of total manufacturing employment in both years.

Table 1: Value of a few key parameters from ASI 2017-18 to 2021-22 in current prices

(Value figures are in Rupees Lakh)

Year	2017-18	2018-19	2019-20	2020-21	2021-22
Fixed Capital	328,588,927	346,606,975	364,135,165	369,438,562	372,635,444
Invested Capital	446,094,480	477,726,474	497,362,352	519,114,310	554,493,175
Total Persons Engaged (No.)	15,614,619	16,280,211	16,624,291	16,089,700	17,215,350
Total Emoluments	41,835,716	46,207,983	49,172,897	48,389,031	56,082,801
Input	660,520,215	774,377,980	749,755,617	719,206,541	987,917,996
Output	807,217,258	928,179,908	898,330,129	880,921,387	1,192,715,147
GVA	146,697,043	153,801,928	148,574,512	161,714,846	204,797,151
Depreciation	23,729,624	26,155,291	27,309,742	28,135,986	29,964,685
NVA	122,967,418	127,646,637	121,264,771	133,578,860	174,832,466

Gross Value Added (GVA)

➢ GVA measures the **value producers add to goods and services** during production.

➢ It's calculated by **subtracting the cost of inputs (intermediate consumption) from total output.**

➢ It's a key component of **Gross Domestic Product (GDP),** reflecting economic growth. **GVA growth rates provide insights into sectoral performance,** aiding economic analysis and policymaking.

○ GVA = GDP + subsidies on products - taxes on products.

➢ If we deduct the depreciation from GVA we get **Net Value Added (NVA).**

○ NVA is the value of output less the values of both intermediate consumption and consumption of fixed capital.

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What is the Annual Survey of Industries (ASI)?

- **About:**
  - The Annual Survey of Industries (ASI) is th**e principal source of industrial statistics** in India. It **started in 1960 with 1959 as the base year** and continues annually except for 1972, under the Collection of Statistics Act, of 1953.
  - From ASI 2010-11, the Survey is being conducted under the **Collection of Statistics Act, 2008.**
    - The Collection of Statistics Act, 2008 has been amended in 2017 as the **Collection of Statistics (Amendment) Act, 2017** which extends the coverage to All India.
  - The **National Statistical Office (NSO) conducts the ASI.** The NSO is part of the MoSPI.
    - The MoSPI is responsible for the coverage and quality of released statistics.
- **Scope and Coverage:**
  - ASI covers factories registered under **Sections 2(m)(i) and 2(m)(ii) of the Factories Act, 1948.**
  - Bidi and cigar manufacturing establishments registered under the **Bidi & Cigar Workers (Conditions of Employment) Act,1966.**
  - **Electricity undertakings** engaged in generation, transmission and distribution of electricity, not registered with the **Central Electricity Authority (CEA).**
  - **Units with 100 or more employees registered** in the **Business Register of Establishments (BRE)** prepared and maintained by the State Governments as and when such lists are shared by the respective State Governments.
- **Data Collection Mechanism:**
  - Data for ASI are collected from the selected factories under the **Collection of Statistics Act 2008** as amended in 2017 and Rules framed there under in 2011.

India's Industrial Sector

- India has witnessed a **significant shift in its manufacturing dynamics**. Traditionally known for its prowess in **textiles, handicrafts,** and **agro-based industries**, the nation has diversified its manufacturing portfolio.
- There has been a consistent recovery in industrial production after the **Covid-19 pandemic.**

- In the **FY 2021-22, industrial production recovered from the Covid pandemic** and registered a double-digit growth of 11.4%. Industrial production further expanded by 5.2% in FY 2022-23.
  - During the April to October period of FY 2023-24, **Index of Industrial Production (IIP)** registered a cumulative growth of 6.9% over the corresponding period of the previous year.
  - **Index of Manufacturing, Mining and Electricity** sector grew by 6.4%, 9.4% and 8.0% respectively during the aforesaid period.
- Initiatives like **'Make in India'** have created a favourable business environment, encouraging investment and indigenous manufacturing.
- **Production-linked incentives (PLIs)** are boosting various sectors and aiming to make India competitive globally.
- The combined **Index of Eight Core Industries** increased by 12.1% (provisional) in October 2023 as compared to the Index of October 2022.
  - The production of **all eight core industries (namely; Cement, Coal, Crude Oil, Electricity, Fertilizers, Natural Gas, Refinery Products and Steel)** recorded positive growth in October 2023 over the corresponding month of 2022.
- As **Industry 4.0 approaches,** integrating technologies like **artificial intelligence, robotics,** and the **Internet of Things** into its manufacturing processes, is crucial, and requires a **skilled and adaptable workforce.**

Blue Economy 2.0

Why in News?

The recent presentation of the **Interim Budget** included a significant emphasis on advancing **Blue Economy 2.0** through the introduction of a novel scheme focused on restoration, adaptation measures, coastal aquaculture, and mariculture, employing an integrated and multi-sectoral strategy.

What is the Blue Economy?

- **About:**
  - Blue economy refers to the **sustainable use of marine resources** for exploration, economic growth, improved livelihoods, and transport while **preserving the health of marine and coastal ecosystems.**
  - In India, the blue economy encompasses a wide range of sectors, including **shipping, tourism, fisheries, and offshore oil and gas exploration.**

Note:

- This is reflected in the **Sustainable Development Goal (SDG 14),** which calls to conserve and sustainably use the oceans, seas and marine resources for sustainable development.

➢ **Necessity for Blue Economy:**

- India has a **vast coastline of 7500 km,** and its **exclusive economic zones (EEZ)** extend over 2.2 million square km. Also, **India is home to 12 major ports**, over 200 other ports, 30 shipyards and **a comprehensive hub of diverse maritime service providers.**

- It advocates the **greening of ocean development strategies** for higher productivity and conservation of the ocean's health.

- Oceans cover three-quarters of the Earth's surface, contain 97% of the Earth's water, and **represent 99% of the living area on the planet.**

➢ **Growth Prospects:**

- The global ocean economy is **currently valued at approximately USD 1.5 trillion annually**, ranking it as the **world's seventh-largest economy**. Projections indicate that **it will double by 2030, reaching USD 3 trillion.**
  - The total value of ocean assets, also known as natural capital, has been estimated at USD 24 trillion.

THE BLUE ECONOMY

- uses smart shipping to lessen the impacts on the environment
- is inclusive and improves the lives of all
- harnesses renewable energy
- is based on sustainable fisheries
- creates jobs, reduces poverty and ends hunger
- takes action against illegal fishing
- conserves marine life and oceans
- protects coastal communities from the impacts of climate change
- tackles marine litter and oceans pollution

What is Blue Economy 2.0?

➢ **About:**

- This is aimed at **promoting climate-resilient activities and sustainable development in coastal areas.**

- With marine ecosystems facing unprecedented threats from **climate change,** pollution, and overexploitation, there is an urgent **need for coordinated action to safeguard the health and resilience of ocean resources.**

Note:

➢ **Components:**
- ❍ **Restoration and Adaptation:**
  - ● Central to the scheme are **measures aimed at restoration and adaptation,** which will involve restoring degraded coastal ecosystems and implementing adaptation **strategies to mitigate the effects of rising sea levels and extreme weather events**.
  - ● These efforts are **crucial for preserving biodiversity, protecting coastal communities,** and maintaining the ecosystem services provided by marine habitats.
- ❍ **Expansion of Coastal Aquaculture and Mariculture:**
  - ● Blue Economy 2.0 scheme will **focus on the expansion of coastal aquaculture and mariculture**, which play a vital role in meeting the growing demand **for seafood while reducing pressure on wild fish stocks.**
  - ● By promoting **sustainable aquaculture practices** and integrating them with **other sectors such as tourism and renewable energy**, the scheme aims to create economic opportunities for coastal communities while **ensuring the long-term viability of marine resources.**
- ❍ **Integrated and Multi-Sectoral Approach:**
  - ● The integrated and multi-sectoral approach adopted by the Blue Economy 2.0 scheme recognises the **interconnectedness of various sectors** and the need for **coordinated action across government departments,** industries, and civil society.
  - ● By fostering collaboration and partnership, the **scheme seeks to harness the collective efforts of stakeholders** to achieve sustainable development goals in coastal areas.

What are the Key Government Initiatives Related to the Blue Economy?

➢ **Deep Ocean Mission**
➢ **Sagarmala project**
➢ **O-SMART**
➢ **Integrated Coastal Zone Management**
➢ **NavIC**
➢ **India-Norway Task Force on Blue Economy for Sustainable Development**
➢ **National Fisheries Policy**

Fiscal Deficit and its Management

Why in News?

Since India has been faring with the **fiscal challenges** in dealing with the National Debts, the Ministry of Finance in its **Interim Budget 2024-25** has decided to reduce India's **Fiscal Deficit** to 5.1% of **Gross Domestic Product (GDP) in 2024-25.**

What is Fiscal Deficit?

➢ **About:**
- ❍ Fiscal deficit refers to the **shortfall in a government's revenue** when compared to its expenditure.
- ❍ When a government's **expenditure exceeds its revenues**, the government will have to **borrow money or sell assets** to fund the deficit.
- ❍ Taxes are the **most important source of revenue** for any government. In 2024-25, the government's tax receipts are expected to be Rs 26.02 lakh crore while its total revenue is estimated to be Rs 30.8 lakh crore.
- ❍ When a government **runs a fiscal surplus**, on the other hand, its revenues exceed expenditure.
  - ● It is, however, **quite rare for governments to run a surplus**. Most governments today focus on keeping t**he fiscal deficit under control rather than on generating a fiscal surplus** or on balancing the budget.

➢ **Projections:**
- ❍ Government estimates that the Fiscal Deficit would be pared to below **4.5% of GDP by 2025-26** announced in **Budget 2021-22.**
- ❍ The government's **revised estimates** also lowered the **fiscal deficit projection for 2023-24 to 5.8% of GDP.**

➢ **Fiscal Deficit and National Debt:**
- ❍ The **National Debt** is the total amount of money that the government of a country **owes its lenders** at a particular point in time.
  - ● **Government debt encompasses various liabilities**, including domestic and external loans, alongside obligations to schemes such as small savings, provident funds, and special securities.

Note:

- These liabilities entail both **interest payments and repayment of principal amounts,** imposing a considerable financial burden on the government's finances.
  - It is usually the amount of debt that a government has accumulated over many years o**f running fiscal deficits and borrowing** to bridge the deficits.
  - The **higher a government's fiscal deficit** as a share of GDP, the **less likely its lenders will be paid back** without trouble.
    - Countries with larger economies can run **higher fiscal deficits**. As of 2022, the leading deficit holders included Italy -7.8%, Hungary -6.3%, South Africa -4.8%, Spain -4.7%, France -4.7%.

➤ **Trends in National Debt:**
  - The debt-GDP ratio stood at **84.4% in 2003-04**, witnessing subsequent declines and rises under different administrations.
  - Post 2014, the government witnessed a **surge in the debt-GDP ratio**, reaching a peak of **88.5% in 2020-21**, driven primarily by the economic disruptions caused by the **Covid-19 Pandemic**.
  - Despite slight improvements in subsequent fiscal years, the ratio remains elevated, projected at **82.4% for 2024-25**, posing significant challenges for fiscal management.

CHART 1

GENERAL GOVERNMENT DEBT (% of GDP)

82.9%   88.5%   82.4%   66.4%

Note: Figures for 2022-23 are estimates and those for 2023-24 and 2024-25 are projections.
Source: International Monetary Fund

CHART 2

CENTRE'S INTEREST AND CAPITAL SPENDING (% of GDP)

4.7%   3.6%   Interest Payment   Capital Expenditure   3.0%   3.4%

Note: Figures for 2023-24 are Revised Estimates and those for 2024-25 Budget Estimates.
Source: Union Budget documents, various years.

Key Formulas
➤ **Fiscal Deficit**= Total Expenditure- Total Receipts (excluding borrowings).
➤ **Revenue Deficit:** This deficit of a government or business can be determined by subtracting the total revenue receipts from the total income expenditure.
○ Revenue deficit= Total revenue receipts – Total revenue expenditure.
➤ **Debt to GDP Ratio:** It It measures how much a nation owes in relation to its GDP
○ **Debt to GDP= Total Debt of Country/Total GDP of Country**

How does the Government Fund its Fiscal Deficit?

➤ **Borrowing from Bond Market:**
  - In order to fund its fiscal deficit, the government mainly borrows money from the bond market where **lenders compete to lend to the government** by purchasing bonds issued by the government.

Note:

- In 2024-25, the Centre is expected to **borrow a gross amount of Rs 14.13 lakh crore from the market,** which is lower than its borrowing goal for 2023-24, as it expects to fund its spending in 2024-25 through higher GST collections.
  - As a government's finances worsen, demand for the government's bonds begins to drop forcing the government to offer to pay a higher interest rate to lenders, and leading to higher **borrowing costs for the government.**

➢ **Role of Reserve Bank of India:**
  - The RBI plays a **significant role in the credit market**, indirectly facilitating government borrowing. While central banks may not directly purchase government bonds from the primary market, they **engage in Open Market Operations (OMO) to acquire bonds from private lenders** in the secondary market.
  - This infusion of liquidity by central banks **effectively supports government borrowing efforts.**
    - **Central bank interventions through OMO** involve creating fresh money, potentially leading to increased money supply and inflationary pressures in the economy over time.

➢ **Monetary Policy:**
  - Monetary policy also plays a crucial role in reducing the **costs for governments** to **borrow money from the market.**
  - Central bank lending rates which were near zero in many countries before the pandemic have **risen sharply in the aftermath of the pandemic.**
    - This makes it more expensive for governments to borrow money and could be one reason why the Centre is keen to bring down its fiscal deficit.

What is the Legislation Related to Fiscal Management in India?

➢ **Fiscal Responsibility and Budget Management (FRBM) Framework:**
  - **The FRBM Act**, instituted in 2003, set ambitious targets for debt reduction, aiming **to limit the general government debt to 60% of GDP by 2024-25.**
  - However, subsequent fiscal trajectories deviated from these targets, with the Centre's outstanding debt surpassing the originally envisioned thresholds.
    - **FRBM Review Committee Report** has recommended a debt to GDP ratio of **60% for the general (combined) government** by 2023, comprising **40% for the Central Government** and **20% for the State Governments.**

Why is it Important to Worry About Fiscal Deficit?

➢ **Impact on Inflation:**
  - There is a strong direct relationship between the government's fiscal deficit and Inflation in the country.
  - When a country's government runs a persistently high fiscal deficit, this can eventually **lead to higher inflation** as the government will be **forced to use fresh money issued by the central bank to fund its fiscal deficit.**
    - The **fiscal deficit in 2020 reached a high of 9.17% of GDP** during the pandemic. It has since decreased significantly and is **expected to reach 5.8% in 2023-24.**

➢ **Fiscal Discipline Improves Ratings:**
  - A lower fiscal deficit indicates better government fiscal discipline. This can lead to higher ratings for Indian government bonds.
  - When the government relies more on tax revenues and borrows less, it boosts lender confidence and lowers borrowing costs.

➢ **Management of Public Debt:**
  - A **high fiscal deficit** can also adversely **affect the ability of the government to manage its overall public debt.**
  - In December 2023, the IMF warned that India's public debt could rise to more than 100% of GDP in the medium term due to risks.
  - A lower fiscal deficit may help the government to more **easily sell its bonds overseas and access cheaper credit** from the international bond market**.**

What can be Done to Manage Fiscal Deficit and National Debt in India?

➢ **Fiscal Discipline and Consolidation:**
  - Adhering to fiscal consolidation targets, as outlined in the FRBM Act is crucial.
  - The government should aim to **gradually reduce the fiscal deficit-to-GDP ratio** to ensure **sustainable public finances.**
  - Implementing prudent fiscal policies, including expenditure rationalisation, revenue enhancement measures, and subsidy reforms, **can help in reducing the reliance on borrowing** and mitigating fiscal imbalances.

Note:

➢ **Enhancing Revenue Mobilisation:**

❍ Strengthening tax administration and **compliance to broaden the tax base** and improve revenue collection.

❍ Exploring avenues for **diversifying revenue sources**, such as introducing new taxes or levies on luxury goods, wealth, or environmental taxes.

➢ **Rationalising Expenditures:**

❍ Conducting a comprehensive review of government expenditures to identify inefficiencies and prioritise spending in key areas such as healthcare, education, and infrastructure.

❍ Implementing measures to **curb non-essential spending and subsidies**, while **ensuring targeted support for vulnerable populations.**

➢ **Debt Management Strategies:**

❍ Developing a prudent debt management strategy to **optimise borrowing costs and minimise refinancing risks.**

❍ **Diversifying the investor base and sources of financing**, including domestic and international markets, to mitigate exposure to market volatility.

➢ **Long-Term Structural Reforms:**

❍ Undertaking structural reforms aimed at **improving the efficiency and competitiveness of the economy**, including labour market reforms, **ease of doing business** initiatives, and governance reforms.

❍ Addressing **structural bottlenecks and challenges in sectors** such as agriculture, manufacturing, and services to unleash growth potential and enhance fiscal sustainability.

Renewables 2023 Report of IEA

Why in News?

The **International Energy Agency** (IEA)'s recent **Renewables 2023 report** paints a complex picture of the renewable energy sector, highlighting both progress and challenges.
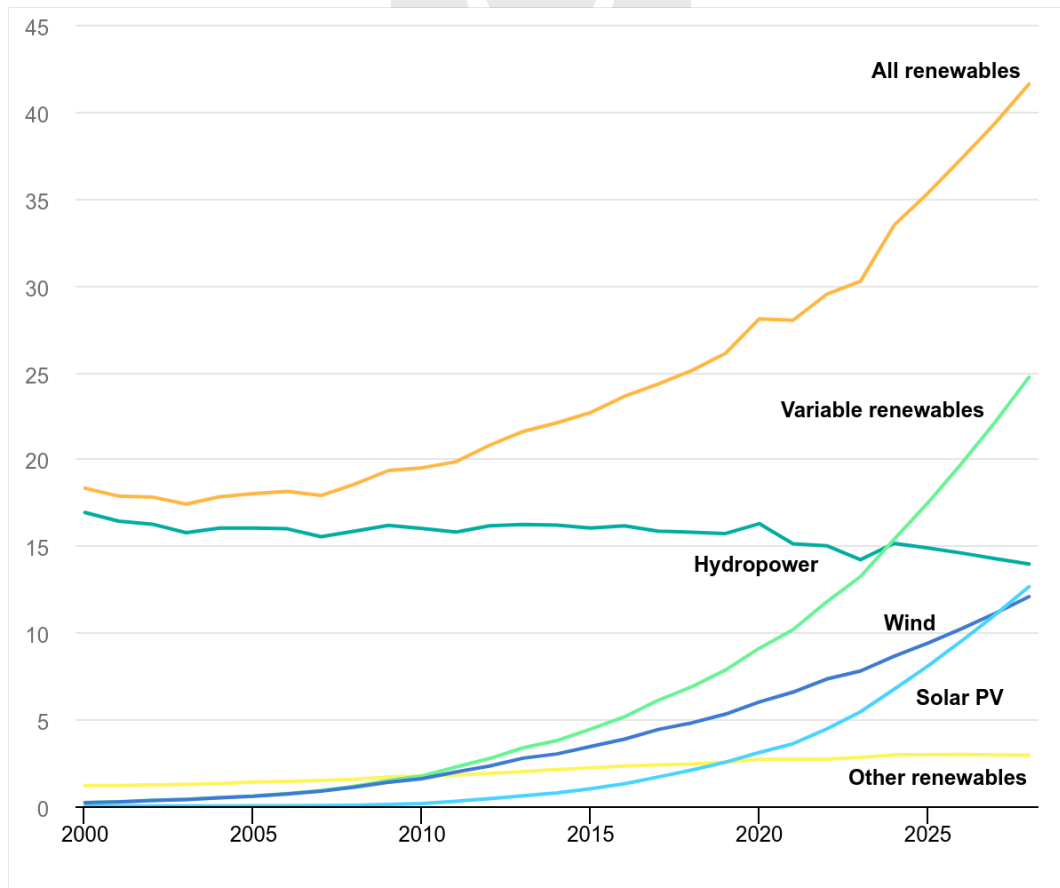
Note:

What are the Major Highlights of the Renewables 2023 Report?

➢ **Record Growth and China's Dominance:** Global annual <u>renewable capacity</u> additions surged by nearly **50% to almost 510 gigawatts (GW) in 2023**, marking the fastest growth rate in two decades.

  ○ **China played a pivotal role**, commissioning as much <u>solar photovoltaics (PV)</u> in 2023 as the entire world did in 2022, while **wind additions grew by 66%** year-on-year.

➢ **Global Power Mix Transformation:** Renewables are projected to **surpass coal as the largest source of electricity generation by 2025,** with **wind and solar PV becoming dominant sources by 2028.**

➢ **Accelerated Growth in Key Regions:**

  ○ **US, EU, India, Brazil:** Supportive policies and improving economic attractiveness are driving accelerated growth in **solar PV and <u>onshore wind installations</u>** in these regions.

  ○ **Middle East and North Africa**: Policy incentives are spurring renewable capacity growth.

    ● While **sub-Saharan Africa** is lagging despite its resource potential.

➢ **Growth Forecast for India:** India is forecast to add **205 GW over 2023-2028**, doubling 2022's cumulative installed capacity, making it the **world's third-largest market for renewables.**

➢ **Solar PV Market Dynamics:** Solar PV module prices dropped by **nearly 50% in 2023** due to increased manufacturing capacity.

  ○ Solar PV and onshore wind are cheaper than both new and existing fossil fuel plants, driving their rapid adoption globally.

➢ **Biofuel Expansion and EV Adoption**: Emerging economies, led by **Brazil**, are driving biofuel expansion.

  ○ Biofuels and renewable electricity in EVs are forecasted to offset significant oil demand by **2028**, emphasizing their complementary role.

➢ **Major Challenges Highlighted in the Report:**

  ○ **Financial Constraints:** Emerging and developing economies face inadequate financing for renewable projects.

    ● Rising interest rates are increasing financing costs, posing challenges to renewable energy developers.

  ○ **Grid Bottlenecks**: Rapid deployment of variable renewables poses **integration challenge**s, leading to increased curtailment in many countries due to inadequate grid expansion.

  ○ **Wind Industry Challenge:** The wind industry faces challenges from **supply chain disruptions,** especially in offshore wind.

➢ **Major Recommendations:** IEA urged governments to **triple global renewable power capacity by 2030**, aligning with the <u>Net Zero Emissions by 2050 (NZE)</u> Scenario.

  ○ To meet the 2030 targets, addressing policy uncertainties, investing in grid infrastructure, easing administrative barriers, and enhancing financing in emerging economies is crucial.

What are India's Renewable Energy Targets and Related Government Interventions?

➢ **India's Renewable Energy Targets:**

  ○ <u>**Panchamrit Goals:**</u>

    ● Reaching a **non-fossil fuel energy capacity of 500 GW** by 2030.

    ● Fulfilling at least **half of its energy requirements via renewable energy** by 2030

    ● **Reducing CO2 emissions by 1 billion tons by 2030;** reducing carbon intensity below 45 percent by 2030.

    ● **Net-Zero emission target by 2070.**

  ○ In August 2022, India updated its <u>Nationally Determined Contribution</u> (NDC) according to which the target to reduce emissions intensity of its GDP has been enhanced to **45% by 2030 from 2005 level.**

➢ **Related Government Initiatives:**

  ○ <u>Pradhan Mantri- Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM- KUSUM)</u>

  ○ <u>National Solar Mission</u>

  ○ <u>Production Linked Incentive (PLI) Scheme for High-Efficiency Solar PV Modules</u>

  ○ <u>Offshore Wind Energy Policy</u>

  ○ <u>Global Biofuel Alliance</u>

  ○ <u>International Solar Alliance</u>

  ○ **Suryamitra Skill Development Programme:** It aims for skill development among the youth, considering the opportunities for employment in the growing **Solar Energy Power Project's installations.**

What is IEA?

➢ **Establishment and Evolution**: IEA was established in 1974 to ensure oil supply security in response to the **1973-1974 oil crisis.**
  ○ Initially focusing on oil supply security and policy cooperation, its mandate expanded over time to encompass a **broader range of energy issues.**
  ○ Currently, the **IEA has four main areas of focus: energy security, economic development, environmental awareness and engagement worldwide.**
    ● In 2022, IEA member governments agreed to expand the Agency's mandate to guide countries towards building net-zero emission energy systems and **include critical minerals and metals** for clean energy technologies.
➢ **Membership:** IEA is made up of 31 member countries.
  ○ In addition, the IEA also includes **thirteen association countries (including India)**.
  ○ Five countries are seeking accession to full membership**, Chile, Colombia, Israel, Latvia and Costa Rica.**
  ○ A candidate **country for the IEA must be a member country of the OECD.**
➢ **Major Reports:**
  ○ **World Energy Outlook Report**
  ○ **India Energy Outlook Report**
  ○ **World Energy Investment Report**
  ○ The Annual Energy Efficiency Market Report

Guidelines on State Guarantees on Borrowings

Why in News?

Recently, a Working Group constituted by the **Reserve Bank of India (RBI)** has made certain recommendations to address issues relating to **Guarantees extended by State governments**.

➢ The Working Group constituted during the 32nd Conference of the State Finance Secretaries held in July 2022.

What Constitutes a Guarantee?

➢ **About:**
  ○ A 'guarantee' is a legal obligation for a State to make payments and protect an **investor/lender from the risk of default by a borrower.**
  ○ A guarantee, as per the **Indian Contracts Act, 1872,** is a contract to "perform the promise, or discharge the liability, of a third person in case of his default. It involves three parties: **the principal Debtor, Creditor, and Surety.**
    ● **Creditor:** The entity to whom the guarantee is given. This is the party to whom the **payment is due**, and they are protected by the guarantee.
    ● **Principal Debtor:** The entity on whose **behalf the guarantee is given**. This is the **party that owes a debt** or has a liability.
    ● **Surety:** The **entity providing the guarantee** (State governments in this context), that **promises to perform the promise** or discharge the liability of the **principal debtor in case of default**.
      ■ The surety undertakes a legal obligation to perform the promise or discharge the liability of the **principal debtor if they default.**
  ○ A guarantee must not be confused with an **'Indemnity'** contract that protects the lender from loss caused to them by the conduct of the promisor (or the principal debtor).
➢ **Illustration:**
  ○ If **A delivers** certain goods or services to B and B does not make the **agreed-upon payment,** B is defaulting and at the risk of being sued for the debt.
  ○ C steps in and promises **that s/he would pay for B**. A agrees to the forbear request. C's action constitutes a guarantee.
➢ **Purpose of a Guarantee:**
  ○ At the state level, guarantees are commonly used in three situations.
    ● **Seeking Concessional Loan:** When **seeking concessional loans** from bilateral or multilateral agencies for public sector enterprises, a **sovereign guarantee** is often required.
    ● **To Enhance the Viability of Projects:** Guarantees are employed to enhance the viability of projects that **promise significant social and economic benefits**.
    ● **To Secure Resources at Lower Interest:** Public sector enterprises may use guarantees to secure resources at lower interest rates or more favourable terms.
➢ **Risk With the Guarantees:**
  ○ The use of guarantees, while convenient in good times, poses **fiscal risks.**

Note:

○ According to the report by the working group, one of the reasons why the instrument has been widely used is that an **upfront cash payment is usually not required in case of guarantees.**

○ This **practice can lead to unforeseen cash outflows** and **increased debt for the state**, especially as guarantee triggers and associated costs are often challenging to estimate.

○ State governments are **often obligated to grant guarantees on behalf of various entities** like state-owned enterprises, cooperative institutions, and urban local bodies **to secure loans from commercial banks** or financial institutions.

● In return, these entities **pay a guarantee commission or fee to the state government.**

What are the Key Recommendations of the RBI Working Group Regarding Guarantee?

➢ **Definition of Guarantee:**

○ The term Guarantee should be **used in a broader sense** and include all instruments **if they create an obligation on the guarantor (State) to make a payment on behalf of the borrower** at a future date.

○ Further, it must **make any distinction between conditional or unconditional,** or **financial or performance guarantees** in order to assess the fiscal risk.

● These are conditional liabilities that may present **a potential risk in the future.**

➢ **Guarantees only for the Principal Loan:**

○ The government guarantees **should not be used to obtain finance** through State-owned entities, which substitute budgetary resources of the State Government.

● Additionally, they should not be allowed to **create direct liability/de-facto liability on the State.**

○ There should be **adherence to Government of India guidelines** that stipulate that **guarantees be given only for the principal amount** and normal interest component of the underlying loan.

○ Guarantees must not be extended for **External Commercial Borrowings,** must not be extended for **more than 80% of the project loan** (depending on the conditions imposed by the lender) and must not be provided to private sector companies and institutions.

○ Appropriate preconditions such as the **period of guarantee, levy of (guarantee) fee to cover risk, government representation on the management board of the borrowing entity,** and right to audit, etc, must be specified.

➢ **Risk Determination, Fee and Ceiling:**

○ The Group recommends that **States assess the risk associated with guarantees** by categorising them **as high, medium, or low risk**, taking into account the **entity's past default history.**

● The methodology used for assigning these risk weights should be transparent and disclosed.

● Based on the risk assessment **minimum guarantee fee must be set at a minimum of 2.5% per annum**.

○ The report emphasises that **invoking a guarantee could impose considerable fiscal strain** on the state government.

● To mitigate potential stress, the Group proposes **imposing a ceiling on guarantees**, limiting them to 5% of **Revenue Receipts or 0.5% of Gross State Domestic Product (GSDP)**, whichever is lower.

➢ **Disclosures & Honouring Commitments:**

○ The Group recommends that the RBI should suggest **banks/NBFCs to disclose the credit given to State-owned entities with State-government guarantees.**

○ The report emphasises the **need for a comprehensive database to track extended guarantees**, proposing the creation of a unit at the State level for this purpose.

○ Acknowledging potential risks, the report highlights that **delays in honoring guarantees could harm the State government's reputation** and pose legal risks.

○ It advises **States to be cautious when providing finance to entities** with a history of not meeting commitments.

○ Additionally, the report emphasizes the **importance of promptly honoring guarantees to maintain credibility** with lenders and investors.

What are the Different Guarantees Given by the Government?

➢ **Guarantees given to RBIs**, other banks and Financial Institutions (like **IFCI, LIC, UTI** etc) **for repayment of principal and payment of interest**, cash credit facility, financing seasonal agricultural operations, and for

providing working capital in respect of companies, corporations, cooperative societies and cooperative banks.

➢ Guarantees given in pursuance of agreements entered into by the **Government of India with International Financial Institutions** towards repayment of principal, payment of interest etc.

➢ **Counter-Guarantees to Banks in consideration of the Banks having issued Letters of Authority to Foreign Suppliers** for Supplies/Services made/rendered by them on credit basis, in favour of the Companies/Corporations.

➢ **Guarantees given to Railways**/State Electricity Boards for due and punctual payment of dues/freight charges by Companies/Corporations. **(Nil for past few years)**

➢ **Performance guarantees given for fulfilment of contracts/projects** awarded to Indian companies or Foreign companies in foreign countries. (Nil for past few years)

China's Shifting Economic Landscape

Why in News?

   China's economy faced significant challenges in 2023, registering **one of its slowest growth rates in over three decades** as it was battered by a crippling property crisis, sluggish consumption, shifting **demographic trends** and global turmoil.

What are the Major Factors Contributing to Economic Challenges in China?

➢ **Economic Status:** China's National Bureau of Statistics (NBS) reported a **5.2% growth in GDP,** reaching 126 trillion yuan in 2023.

   ○ Despite exceeding the target and outperforming the 3% recorded in 2022, this growth represents the **slowest performance since 1990,** excluding pandemic years.

   ○ **Deflation** for three consecutive months added to the economic headwinds.

➢ **Factors Contributing to Economic Challenges:**

   ○ **Lack of Jobs for Youth:** More than 1 in 5 people between 16 and 24 were unemployed in May 2023 highlighting challenges in job creation for the youth.

● The working-age population between **15 to 59 years**, which is seen as being productive in an economy, has now fallen to 61% of the total population.

○ **Demographic Trends:** China's **population has been declining since 2016,** reflecting a **falling Total Fertility Rate (TFR)** and challenges in overcoming the legacy of the **one-child policy.**

● Despite policy changes allowing up to **3 children**, demographic trends have not reversed.

○ **Unsteady Real Estate Market:** The real estate market, traditionally a significant contributor to China's economy, faces financial challenges with major firms like **Evergrande and Country Garden experiencing difficulties.**

What are the Other Challenges Related to China in Global Context?

➢ **Environmental degradation**: China is the **world's largest source of greenhouse gas emissions.** Air pollution is responsible for about 2 million deaths in China per year **(WHO)**.

➢ **Tense Relations with the United States:** The ongoing trade war, competition for technological dominance, and differences in values create significant tension between **China and the US**, impacting the global balance of power.

   ○ The US and its allies are increasingly **decoupling from China** in key technological areas, like semiconductors.

➢ **South China Sea Disputes:** China's territorial claims in the **South China Sea** are **contested by several countries**, raising concerns about regional stability and freedom of navigation.

➢ **Human Rights Concerns:** China has faced international scrutiny and criticism regarding human rights issues, **particularly concerning the treatment of ethnic minorities such as the Uighurs in Xinjiang.**

How India is Transitioning Amid the Economic Turmoil in China?

➢ **Demographic Advantage:** India's working-age population is projected to constitute **68.9% of the total population by 2030**, in stark contrast to China's ageing population.

➢ **Evolving Manufacturing and Transportation Landscape**: Initiatives such as the **India Semiconductor Mission** and

Note:

dedicated industrial corridors like the **Delhi-Mumbai Industrial Corridor** are bolstering infrastructure and drawing investments to India.

○ **Foxconn, a major Apple supplier,** is relocating a substantial portion of iPhone production **from China to India.**

➤ **Business-Friendly Environment:** Programs like **Make in India** and the **production-linked incentive scheme** offer crucial support for businesses.

○ The PLI scheme for electronics has successfully lured major players such as **Samsung, Pegatron, Rising Star, and Wistron.**

➤ **Thriving Domestic Market:** As the world's **fifth-largest economy (by nominal GDP)**, India presents significant opportunities for locally manufactured goods, attracting multinational corporations to integrate India into their production processes.

○ **H&M**, for instance, sources from Indian garment manufacturers.

➤ **Emphasis on Sustainability and ESG:** With a goal to achieve **50% renewable energy capacity by 2030**, India is attracting companies committed to green manufacturing.

○ **Tesla**, for example, plans to enter the **Indian electric vehicle market** in 2024.

➤ **Global Recognition and Dependability:** India's membership in the **IMEC corridor and its leadership in the International Solar Alliance** are enhancing its trade appeal and global reputation as a reliable investment destination.

What are the Challenges Hindering India's Progress?

➤ **Infrastructure Constraints:** Despite ongoing improvement, India's infrastructure, including **power grids, logistics networks, and transportation systems, lags behind China's,** potentially hindering manufacturing competitiveness and attracting investment.

➤ **Skilled Workforce Shortage:** While demographics offer a large working-age population, a significant portion **lacks the specific skills (Skill India Report: Only 5% Indians formally skilled)** required for high-value manufacturing, necessitating heavy investment in upskilling and vocational training.

➤ **Lack of Desired Ease of Doing Business:** While initiatives like Make in India aim to improve, **India** still ranks lower than China in global ease of doing business rankings, requiring further measures to simplify processes and reduce red tape.

➤ **Lack of R&D Push:** Despite advancements, India continues to trail in research and development capabilities, allocating only **0.6-0.7% of its GDP to R&D**, in stark contrast to China's **2.56% investment**.

Economics of the Food System Transformation

Why in News?

Recently, the Food System Economics Commission has published a report titled-"*The Economics of the Food System Transformation*", highlighting that a sustainable transformation of existing food systems is urgently required at an estimated total cost of USD 500 billion per year.

➤ The Food System Economics Commission (FSEC) is a **private consortium of scientists** across nationalities and academic fields, aimed at identifying the challenges to food system security and the policy changes required to overcome them.

What are the Food Systems?
➤ According to the **Food and Agriculture Organisation (FAO),** food systems encompass the entire range of actors involved in: ○ **Production, aggregation, processing, distribution, consumption** and disposal of food products that originate from agriculture, forestry or fisheries, and parts of the broader economic, societal and natural environments in which they are embedded.

What are the Key Highlights of the Report?

➤ **Current Costs and Impacts:**

○ Globally, current food systems **cost significantly more than they contribute** to development. A **sustainable transformation of existing food systems** is urgently **required at an estimated total cost of $500 billion per year**.

● This **cost is equivalent to only 0.2–0.4%** of global **GDP (Gross Domestic Product)** and is small relative to the multi-trillion dollar benefits it could bring.

➤ **Current Food System Challenges:**

○ The current global food system is characterised by **hidden environmental, health, and social costs** exceeding 10 trillion USD in 2020.

Note:

- If current trends persist, over 640 million individuals (including 121 million children) could suffer **from Hunger** and **Malnutrition by 2050.**
- **Food System to Drive Global Greenhouse Gas:**
  - Under the existing scenario, food systems will continue to drive a third of global **Greenhouse Gas (GHG)** emissions, which will contribute to **2.7 degrees Celsius of warming** by the end of the century compared to pre-industrial periods.
- Food production will become increasingly vulnerable to climate change, with the likelihood of extreme events dramatically increasing.
- **Pathways to 2050:**
  - The report contrasts **two pathways up to 2050:** Current Trends (CT) and Food System Transformation (FST).
    - The **CT pathway shows continued food insecurity, obesity increase**, and negative environmental impacts by 2050.
    - Transforming food systems can contribute significantly to economies and address health and climate challenges.
    - **Global convergence towards healthy diets** could contribute as much as **70% of the total economic benefits** of pursuing the FST pathway.
    - Food systems under **FST could become net carbon sinks by 2040,** helping **limit global warming to below 1.5°C.**
    - Positive developments include extensive reforestation, reducing extreme weather events, protecting land, halving nitrogen surplus, and reversing biodiversity loss.
- **Recommendations:**
  - Lifting **financing constraints for lower-income countries** is crucial to unlocking the global benefits of transforming food systems.
  - Policymakers are urged to face the food system challenge, make necessary changes, and reap short- and long-term benefits globally.
  - The report emphasises the need for comprehensive and sustainable pathways for the transformation of food systems.

How can we make the Global Food System More Sustainable?

- **Reduce Food Waste:**
  - Encourage and **support the adoption of circular food systems**, where surplus food is **efficiently redistributed to those in need**.
  - Develop and implement **policies** that incentivize businesses and consumers to **minimize food waste.**
- **Optimize Food Production Processes:**
  - Promote and i**nvest in smart farming practices** that utilise technology to monitor **and optimize growing conditions.**
  - Encourage the **adoption of sustainable agriculture techniques** such as hydroponic and vertical farming.
  - Support **research and development of crop varieties** that are resilient to environmental challenges, reducing the need for excessive resource input.
- **Promote Sustainable Agricultural Practices:**
  - Advocate for the **use of regenerative agriculture,** which focuses on soil health and ecosystem restoration.
  - Implement **precision farming techniques to reduce overuse of fertilizers,** pesticides, and water.
  - Support **farmers in transitioning to more sustainable and organic farming** methods.
- **Encourage Sustainable Consumption:**
  - Promote a **shift towards plant-based diets,** which generally have a **lower environmental impact** than diets rich in animal products.
  - Educate **consumers about the environmental and social impacts** of their food choices.
  - Support **local and sustainable food markets to encourage** the consumption of locally produced goods.
- **Invest in Research and Innovation:**
  - Allocate **resources to research and development efforts aimed at creating more sustainable agricultural** practices and technologies.
  - Support initiatives tha**t focus on climate-resilient crops and innovative solutions** to address emerging challenges in the food system.
- **Empower Local Communities:**
  - Support **community-led initiatives for sustainable agriculture and food production.**
  - Provide **training and resources to farmers, especially smallholders**, to adopt sustainable practices.
  - Ensure that **local communities have a voice in decision-making processes** related to food production and distribution.

Note:

Interim Budget 2024-2025

Why in News?

Recently, the **Interim Budget 2024-25** was tabled in the parliament. It envisions '**Viksit Bharat**' by **2047**, with all-round, all-pervasive, and all-inclusive development.

What is an Interim Budget?

➢ An Interim Budget is presented by a government that is going through a transition period or is in its **last year in office ahead of general elections.**

➢ The purpose of the interim budget is to **ensure the continuity of government expenditure and essential services** until the new government can present a **full-fledged budget** after taking office.

What is the Difference Between Interim Budget and Vote on Account?

Feature	Interim Budget	Vote on Account
Constitutional Provision	Article 112	Article 116
Purpose	Financial Statement presented by the government ahead of general elections.	To meet essential government expenditures for a limited period until the budget is approved.
Duration of Expenditure	Covers a specific period, usually a few months until a new government is formed and a full budget is presented.	It is generally granted for two months for an amount equivalent to one-sixth of the total estimation.
Policy changes	Can propose changes in the tax regime	Cannot change the tax regime under any circumstances
Impact on Governance	Provides continuity in governance during the transition period between two governments.	Ensures the smooth functioning of the government and public services until the regular budget is approved.

What are the Major Highlights of the Interim Budget 2024-25?

➢ **Capital Expenditure:** An 11.1% increase in the **capital expenditure** outlay for 2024-2025 was announced.
  ○ The capital expenditure is set at **Rs 11,11,111 crore**, constituting **3.4% of the GDP**.

➢ **Economic Growth Projections:** The GDP growth for **FY 2023-24 real GDP growth is** projected at **7.3%**, aligning with the RBI's revised growth projection.
  ○ The **International Monetary Fund** upgraded India's growth projection to **6.3% for FY 2023-24**. It also anticipates India becoming the **third-largest economy in 2027.**

➢ **Revenue and Expenditure Estimates (2024-25):**
  ○ **Total Receipts:** Estimated at Rs 30.80 lakh crore, excluding borrowings.
  ○ **Total Expenditure**: Projected at Rs 47.66 lakh crore.
  ○ **Tax Receipts:** Estimated at Rs 26.02 lakh crore.

➢ **GST Collections:** Reached **₹1.65 lakh crore** in December 2023, crossing the ₹1.6 lakh crore benchmark for the seventh time.

➢ **Fiscal Deficit and Market Borrowing:** **Fiscal deficit** is estimated at **5.1% of GDP in 2024-25**, aligning with the **goal of reducing it below 4.5% by 2025-26** (announced in budget 2021-22).
  ○ Gross and net market borrowings through dated securities in **2024-25** are estimated at **Rs 14.13 and 11.75 lakh crore**, respectively.

➢ **Taxation:** The Interim Budget **maintains the existing rates for direct and indirect taxes**, including import duties.
  ○ **For Corporate Taxes:** 22% for existing domestic companies, 15% for certain new manufacturing companies.
  ○ No tax liability for taxpayers with income up to **₹7 lakh** under the new tax regime.
  ○ Certain tax benefits for **Start-Ups and investments** extended by one year up to March 31, 2025.

➢ **Priorities:** Emphasizing the focus on the **Poor, Women, Youth and Farmer.**

Note:

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UNION ₹ BUDGET

Drishti IAS
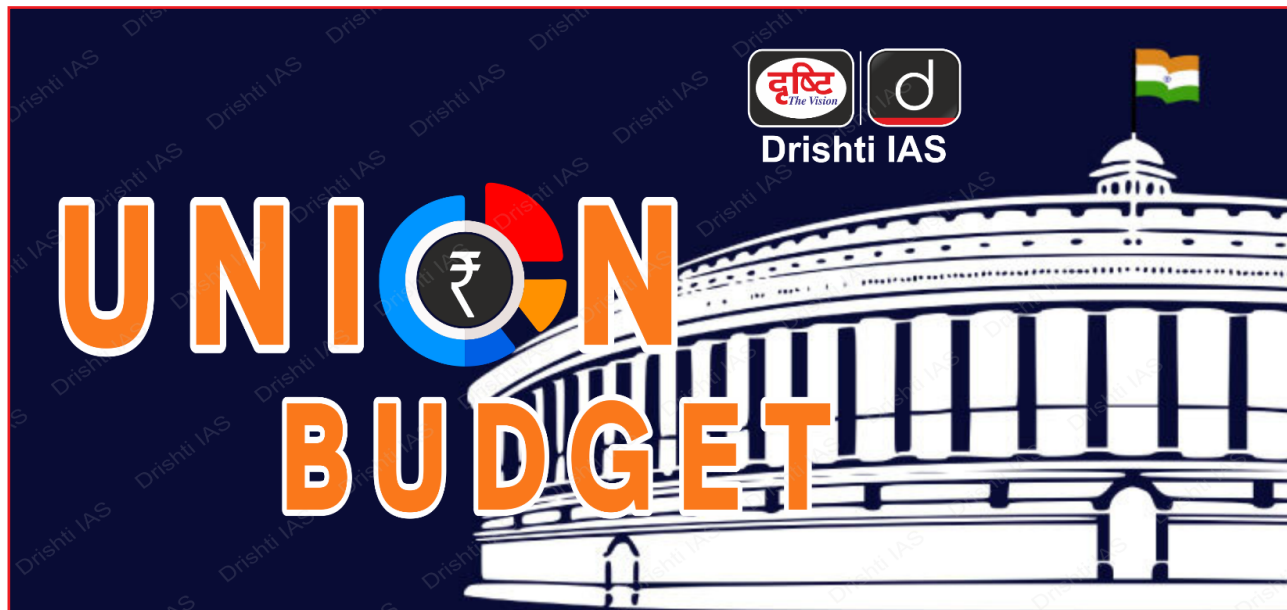
A **statement of the estimated receipts and expenditure** of the Govt in an FY

ARTICLE 112 (PART V)

- **President of India** to present the **Annual Financial Statement** for each FY before both Houses of Parliament

  The term 'Budget' is not mentioned anywhere in the Constitution of India

NODAL BODY FOR PREPARING BUDGET

- **Budget Division** (Dept of Economic Affairs, Ministry of Finance) in **consultation with NITI Aayog** and concerned Ministries

  The first Budget of Independent India was presented in 1947

MAJOR COMPONENTS OF BUDGET

- Estimates of **revenue and capital receipts**
- **Ways and means** to raise the revenue
- Estimates of **expenditure**
- Actual receipts/**expenditures of closing FY** (+ deficit/surplus)
- **Economic/financial policy** of upcoming FY

  Till 2017, the Govt of India had 2 budgets - Railway Budget and General Budget

STAGES OF BUDGET ENACTMENT

- **Presentation**
- **General discussion**
- **Scrutiny** by Dept Committees
- **Voting** on Demands for Grants
- Passing an **Appropriation Bill**
- Passing of **Finance Bill**

What else does the Constitution of India provide for the Budget?

- **Without the recommendation of the President:**
  - No demand for a grant can be made
  - No money bill imposing tax can be introduced

- No money can be withdrawn from the Consolidated Fund of India except under appropriation made by law

- **Role of Parliament:**
  - Money/Finance Bill (involving taxation) - introduced only in LS
  - Vote on the demand for grants - RS has no such power
  - Money/Finance Bill - to be returned to LS by RS in 14 days
    - LS may/may not accept the recommendations made by RS

- ○ **Poor:** Successful movement of **25 crore people out of multidimensional poverty**.
  - ● Credit assistance was provided to **78 lakh street vendors under PM-SVANidhi**.

Note:

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- **Women:** Disbursement of 30 crore **Mudra Yojana** loans to women entrepreneurs.
  - 43% of female enrolment in **STEM courses.**
  - Assistance to 1 crore women through 83 lakh SHGs, fostering **'Lakhpati Didis.'**
  - **28% increase in female enrolment** in higher education over a decade.
- **Youth:** Training of 1.4 crore youth under the **Skill India Mission.**
  - Fostering entrepreneurial aspirations with 43 crore loans sanctioned under **PM Mudra Yojana.**
- **Farmers**: Direct financial assistance was provided to 11.8 crore farmers under **PM-KISAN**.
  - Crop insurance extended to 4 crore farmers through **Fasal Bima Yojana.**
  - Integration of 1,361 mandis under **eNAM** for streamlined agricultural trade.
- **Major Development Plans:**
  - **Infrastructure:**
    - **Railways:** Three major economic railway corridor programmes will be implemented- **energy, mineral & cement corridors, port connectivity corridors, and high traffic density corridors**.
      - **Forty thousand normal rail bogies will be converted to Vande Bharat standards** for enhanced safety, convenience, and passenger comfort.
    - **Aviation**: Expansion of existing airports and comprehensive development of new airports under **the UDAN scheme.**
    - **Urban Transport:** Promotion of urban transformation via Metro rail and **NaMo Bharat.**
  - **Clean Energy Sector:**
    - Viability gap funding for wind energy
      - It will help in **harnessing offshore wind energy potential**, aiming for an initial capacity of **1 gigawatt.**
    - Establishment of **coal gasification** and liquefaction **capacity of 100 million tonnes by 2030.**
    - **Phased mandatory blending** of CNG, PNG and **compressed biogas**
    - Financial assistance for procurement of **biomass aggregation machinery**
    - **Rooftop solarization: 1 crore households** will be enabled to obtain up to **300 units of free electricity per month**

- Strengthening **e-vehicle ecosystem** by supporting manufacturing and charging
- New scheme of **biomanufacturing and bio-foundry** to be launched to support environment friendly alternatives
- **Housing Sector:** Government plans to subsidize the construction of **30 million affordable houses in rural areas.**
  - **Housing for Middle Class scheme** to be launched to promote middle class to buy/built their own houses
- **Healthcare Sector:** Encouraging **Cervical Cancer Vaccination** for girls (9-14 years).
  - **U-WIN platform** for immunization efforts of **Mission Indradhanush** to be rolled out.
  - Expanding the **Ayushman Bharat scheme** to **include all ASHA workers, Anganwadi workers, and helpers.**
- **Agricultural Sector :** Encouraging the use of '**Nano DAP'** for various crops across all agro-climatic zones.
  - Formulating policies to support dairy farmers and combat **Foot and Mouth Disease.**
  - Strategizing for AtmaNirbharta (self-reliance) in **oilseeds**, covering research, procurement, value addition, and crop insurance.
    - **Nano-DAP (Di-ammonium Phosphate)** is a nanotechnology-based agri-input developed by the Indian Farmers Fertilizer Cooperative Limited **(IFFCO).** It helps in correcting the **Nitrogen & Phosphorus deficiencies** in standing crops.
- **Fishery Sector:** Establishing a new department, '**Matsya Sampada**,' to address the needs of fishermen.
- **For States Capex:** The continuation of the **fifty-year interest-free loan scheme** for capital expenditure to states was announced.
  - A total outlay of **Rs 1.3 lakh crore**, with a provision of Rs 75,000 crore for fifty-year interest-free loans to support state-led reforms.
  - Special attention will be paid to the eastern region to make it a powerful driver of India's growth.
- **Others:**
  - Establishment of a corpus of **Rs 1 lakh crore** with a fifty-year interest-free loan to encourage research and innovation in **sunrise domains.**

Note:

- Also, aiming to boost private sector participation in research and innovation.
- To address **rapid population growth** and demographic shifts, the government will form a **high-powered committee.**
  - The committee will provide comprehensive recommendations aligned with the **goal of 'Viksit Bharat.'**

Rupee Comes From

Income Tax (19%)
Borrowing and Other Liabilities (28%)
Union Excise Duties (5%)
Non-Tax Receipts (7%)
Corporation tax (17%)
Non-Debt Capital Receipts (1%)
Customs (4%)
GST and other taxes (18%)

Rupee Goes To

Pensions (4%)
Other Expenditure (9%)
Interest Payments (20%)
States' share of Taxes and Duties (20%)
Finance Commission and other transfers (8%)
Centrally Sponsored Schemes (8%)
Central Sector Schemes (16%)
Subsidies (6%)
Defence (8%)

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What are the Funds Related to the Budget in India?

➢ **Consolidated Fund of India:** Article 266 (1) of the Constitution consolidates all **revenues, loans, and loan repayments received by the Union Government** into a single fund known as the Consolidated Fund of India.
  ○ Withdrawal needs parliament permission (except for Charged Expenditure like Judges' salaries).

➢ **Public Account of India:** Under **Article 266 (2),** it includes incoming money from provident fund, small savings, postal deposit etc.
  ○ Government acts similar to a banker transferring funds from here to there so parliament permission is not necessary.

Allocation to Major Schemes (in ₹ crore)

Mahatma Gandhi National Rural Employment Guarantee Scheme
60,000 — 2023-24(BE)
86,000 — 2024-25(BE)

Ayushman Bharat-PMJAY
7200 — 2023-24(BE)
7500 — 2024-25(BE)

Production Linked Incentive Scheme
4,645 — 2023-24(BE)
6,200 — 2024-25(BE)

Modified Programme for Development of Semi-conductors and display manufacturing ecosystem
3,000 — 2023-24(BE)
6,903 — 2024-25(BE)

Solar Power (Grid)
4,970 — 2023-24(BE)
8,500 — 2024-25(BE)

National Green Hydrogen Mission
297 — 2023-24(BE)
600 — 2024-25(BE)

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➢ **Contingency Fund of India:** It is established under the **Contingency Fund of India Act, 1950** and operates as an imprest in accordance with **Article 267(1).**
  ○ It serves the purpose of **offering advances to the government for unforeseen expenditures during the fiscal year,** pending authorization by Parliament.
  ○ Funds withdrawn from the Contingency Fund are replenished upon parliamentary approval through **Supplementary Demands for Grants.**

Hybrid Vehicles as Alternative to EVs

Why in News?

Recently, HSBC Global Research has released a note, suggesting that, in the next 5-10 years, India should prioritize adopting **Hybrid Vehicles** as a **Sustainable Mobility Solution** before transitioning to full **Battery Electric Vehicles (BEVs).**

➢ Hybrid vehicles integrate a conventional Internal Combustion Engine with an Electric Propulsion system.

Note:

How is India Faring in Adopting Electric Vehicles (EVs)?

➢ India is actively pursuing electrification in its automotive sector, with significant investments and focus on EVs. While many automobile industries in the country are heavily investing in EVs, some are prioritising hybrid vehicles.

➢ The government is providing clear tax incentives **primarily for a specific category of cars.** Other technological platforms in the automotive industry are grouped together in the upper end of the tax bracket, suggesting a tax structure that **may not be equally favourable for all types of vehicular technologies.**

➢ India's electric mobility plan is **prominently focused on the widespread adoption of BEVs** to replace traditional **internal combustion engine (ICE)** vehicles.

➢ In this context **lithium-ion (Li-ion) batteries are currently considered the most viable option.** This indicates a strategic **emphasis on BEVs and a preference** for specific battery technologies to drive the electric mobility transition in the country.

What are Battery Electric Vehicles (BEVs)?

➢ **About:**
  ○ BEVs are a type of electric vehicle that runs solely on electric power stored in high-capacity batteries.
  ○ They do not have an **Internal Combustion Engine (ICE)** and produce **zero tailpipe emissions.**
  ○ BEVs use **electric motors to drive the wheels**, providing instant torque and smooth acceleration.

➢ **Battery Technology:**
  ○ BEVs rely on advanced battery technology, primarily **Lithium-ion (Li-ion) Batteries.**
  ○ Li-ion batteries offer **high energy density, longer range**, and improved performance.

➢ **Charging Infrastructure:**
  ○ BEVs require a **network of charging stations** for recharging their batteries. Charging infrastructure includes **various types of chargers:**
    ● Level 1 (household outlets)
    ● Level 2 (dedicated charging stations)
    ● Level 3 (DC fast chargers).
  ○ Public charging stations, workplaces, and residential buildings play a crucial role in expanding the charging infrastructure.

FOUR TYPES OF EVs

HEVs: Conventional hybrid electric vehicles (such as variants of the Toyota Hyryder Hybrid or Honda City e:HEV in India) combine a conventional ICE system with an electric propulsion system, resulting in a hybrid drivetrain that substantially lowers fuel usage. The onboard battery in a conventional hybrid is charged when the IC engine is powering the drivetrain.

PHEVs: Plug-in hybrid vehicles (such as the Chevrolet Volt) also have a hybrid drivetrain that uses both an ICE and electric power for motive power, backed by rechargeable batteries that can be, in this case, plugged into a power source.

BEVs: Vehicles like the Tata Nexon in India, or the Nissan Leaf and Tesla Model S, have no ICE or fuel tank, and run on a fully electric drivetrain powered by rechargeable batteries.

FCVs: Fuel cell vehicles (such as Toyota's Mirai and Honda's Clarity) use hydrogen to power an onboard electric motor. FCVs combine hydrogen and oxygen to produce electricity, which runs the motor, and the only residue of the chemical process is water. Since they're powered entirely by electricity, FCVs are considered EVs — but unlike BEVs, their range and refuelling processes are comparable to conventional cars and trucks.

What are the Challenges in Adoption of Battery Electric Vehicles?

➢ **Upfront Cost:**
  ○ The experience in markets from **Norway to the US and China** shows that the **electric push works only if it is backed by state subsidies.**
    ● Norway's EV policy has fostered the world's most advanced EV market. So, the government waives the **high taxes on EVs, which** it imposes on sales of non-electrics; it lets electric cars run in bus lanes; toll roads are free for electric vehicles; and parking lots offer a free charge.
  ○ However, in India, subsidies, particularly in the form of tax breaks, often benefit th**e middle or upper middle classes**, who are the primary purchasers of electric four-wheelers.
    ● This distribution pattern **poses a hurdle in ensuring** that subsidies effectively **reach a broader demographic.**

➢ **Charging Infrastructure:**
  ○ Countries like **Norway and China, leaders in EV adoption,** attribute their success to sustained efforts in **expanding public charging infrastructure.**
    ● **China,** particularly dominant in charger numbers, boasts **85% of global fast chargers and 55% of slow chargers.**
    ● **Norway has 99% hydroelectric power. In India,** the grid is still fed largely by **coal-fired thermal plants.**
  ○ However, **India** faces a unique challenge with **only about 2,000 operational charging stations** for its growing EV market. This challenge is intensified by the dominance of **two- and three-wheelers,** each with distinct charging requirements.

Note:

- An analysis by the **World Bank (WB)** has found that **investing in charging infrastructure is between four and seven times more effective in ensuring EV adoption** compared with providing upfront purchase subsidies.

➢ **Supply Chain Issues:**

○ The global supply chain for key **components like lithium-ion batteries is concentrated in a few countries,** leading to concerns about supply chain stability and dependence on specific nations for crucial materials.

- More than **90% of the global Li production is concentrated in Chile, Argentina, and Bolivia**, alongside Australia and China, and other key inputs such as **cobalt and nickel are mined in the Congo and Indonesia.**

○ India would, therefore, be **almost entirely dependent on imports from a small pool of countries** to cater to its demand.

- The **demand for Li-ion batteries from India is projected to grow at a CAGR of more than 30%** by volume up to 2030, which translates to **more than 50,000 tonnes of lithium requirement** for the country to manufacture EV batteries alone.

➢ **Consumer Awareness and Education:**

○ Many consumers may still lack awareness of the benefits of BEVs, and **misconceptions about their capabilities**, charging infrastructure, and overall cost-effectiveness can impede adoption.

○ Consumer preference for **ICE vehicles based on brand loyalty, resale value**, and comfort and limited knowledge of potential buyers regarding EV benefits and features further adds to the problem.

What are Hybrid Vehicles?

➢ **About:**

○ Hybrid vehicles combine a **traditional Internal Combustion Engine (ICE) with an Electric Propulsion system**, allowing the vehicle to operate using either or both power sources.

○ There are different types of hybrid systems, but the most common ones include **parallel hybrids** (both the engine and electric motor can power the vehicle independently) **and series hybrids** (only the electric motor drives the wheels, while the engine generates electricity).

➢ **Significance:**

○ **Practicality in the Medium Term (5-10 years):**

- Hybrids are seen as a **practical and viable option** for the medium term as India gradually **moves towards full electrification** of its vehicle fleet. This transition is **expected to take 5-10 years**.

○ **Cost of Ownership Perspective:**

- Hybrids are considered **cost-effective**, making them an **attractive option for consumers.**

- Hybrid cars **use both fuel and electric power** to run, resulting in **better fuel economy** compared to conventional fuel cars. This translates to cost savings for drivers over time.

○ **Critical for Decarbonization Drive:**

- Hybrid vehicles play a role in **India's Decarbonization efforts.** Hybrid vehicles have **lower total (well-to-wheel, or WTW) carbon emissions than both electric and traditional ICE** vehicles for similarly sized vehicles.

  ■ Hybrids emit 133 grams per kilometre (g/km) of CO_2, while **EVs emit 158 g/km.** This translates to hybrids **being 16% less polluting than the corresponding EV.**

  ■ **Total (well-to-wheel, or WTW) carbon emissions** does not focus only on tailpipe emissions, but **includes vehicle emissions** (tank-to-wheel, or TTW) and **emissions from crude mining, refining, and power generation as well.**

- Hybrids are also critical for India's decarbonization drive. The **cheaper upfront cost of hybrids will encourage many more people to adopt** low-emission vehicles.

What are the Other Possible Alternative Technologies to BEVs?

➢ **Ethanol & Flex Fuel:**

○ **Flex fuel vehicles can** run on various fuel types, including **ethanol, reducing reliance on fossil fuels**.

➢ **Fuel Cell Electric Vehicles (FCEVs) & Hydrogen ICE:**

○ FCEVs run on hydrogen fuel cells, which produce electricity and **water as the only by-products** offering a clean and efficient alternative to BEVs.

○ **Hydrogen ICE vehicles** use hydrogen as a fuel in ICEs offering a simpler and cheaper alternative to BEVs.

Note:

- However, both FCEVs and Hydrogen ICEs have their own shortcomings in terms of infrastructure and zero emissions.

➢ **Synthetic Fuels:**
  ○ **Porsche is developing synthetic fuels** that make **ICEs CO2-neutral,** potentially extending the life of ICE vehicles.
  ○ These fuels, **produced from carbon dioxide and hydrogen using renewable energy,** could have broader applications.

What are Some Government Initiatives to Promote EV Adoption?

➢ **Faster Adoption and Manufacturing of Electric Vehicles (FAME) Scheme II**
➢ **National Electric Mobility Mission Plan (NEMMP)**
➢ **National Mission on Transformative Mobility and Battery Storage**
➢ **Go Electric campaign**
➢ **Production Linked Incentive (PLI) scheme:**
  ○ Incentives for the **manufacturing of EVs and components**
➢ **Ministry of Power's Revised Guidelines on Charging Infrastructure:**
  ○ At least one charging station to be present in a grid of 3 km and at every 25 km on both sides of the highways.
➢ **Amendment to Model Building Bye-laws, 2016 (MBBL):**
  ○ Mandatory to set **aside 20% of the parking space for EV charging facilities** in residential and commercial buildings.
➢ **India's support to the global EV30@30 campaign**

IEA Report Electricity 2024

Why in News?

Recently, the **International Energy Agency (IEA)** unveiled key insights into India's energy future with its report **"Electricity 2024."**

➢ This comprehensive analysis highlights trends, such as the persistent role of **coal,** a surge in renewable energy, and the promising growth of nuclear power, shaping India's power sector until 2026.

What are the Key Highlights of the Electricity Report 2024?

➢ **Continued Reliance on Coal:**
  ○ **India is projected to rely on coal** to meet rising electricity demand through 2026.
    - Coal-fired generation is expected **to meet 68% of India's electricity demand by 2026,** despite a decrease from 74% in 2023.
    - **Coal-fired power generation** is expected to rise by 2.5% annually (2024-2026).
    - Despite **India's net-zero target by 2070,** coal is expected to dominate, meeting 68% of demand.
➢ **Renewable Generation:**
  ○ **Renewable energy (RE)** generation remained relatively stable, with a 21% share of electricity generation in 2023. The rise in solar and wind was largely offset by reduced hydropower output
  ○ Close to 21 gigawatts (GW) of RE capacity was added during 2023, with **RE accounting for nearly 44% of total installed capacity** in 2023.
➢ **Electricity Demand Dynamics:**
  ○ India's electricity demand **rose by 7% in 2023**, driven by rapid economic growth and increased space cooling needs.
  ○ Expected annual **average growth of 6.5% between 2024 and 2026.**
  ○ India's electricity demand is projected to **outpace China's by 2026**, with the world's fastest growth rate.
➢ **Global Comparison and Emerging Economies:**
  ○ China holds the largest volume of expected growth, India's electricity demand in the three years might nearly be equivalent to the United Kingdom's.
  ○ Developed economies reported substantial reductions in manufacturing and industrial output, and high inflation.
    - About **85% of new electricity capacity** is expected from **emerging economies,** particularly in South Asia, with China and India in the lead.
➢ **Hydropower Challenges and Mandates:**
  ○ Changing weather patterns led to a **15% fall in hydropower generation** in 2023.
    - To ensure uninterrupted power supply, the government mandated a **blending of a minimum of 6% of imported coal** with domestic coal until March 2024.

Note:

- ➢ **Diversification Efforts:**
  - ❍ Besides adding **wind and solar power** capacity, **large hydro and nuclear power projects** are being developed in the country.
- ➢ **Nuclear Power Surge:**
  - ❍ More than half of the nuclear power plants in the pipeline globally (between 2024-2026) **are in China and India.**
    - ● IEA forecasts **global nuclear generation will be almost 10% higher in 2026,** compared to 2023.
  - ❍ India announced plans **in 2022 to triple its nuclear capacity by 2032,** aiming to add 13 GW, with 6 GW currently under construction.
    - ● India currently has **23 operable nuclear reactors** providing about 2% of the country's electricity.
    - ● Report highlighted that the **largest domestically built nuclear power plant, the 700 MWe Kakrapar Unit 3 reactor,** commenced operations in Gujarat in June 2023 and reached full capacity in August 2023.
  - ❍ Based on the country's project timeline, **Nuclear power generation is expected to increase** rapidly during 2024-2026, with new plants totalling an **estimated 4 GW of capacity entering commercial operation**".
- ➢ **Global Nuclear Landscape:**
  - ❍ According to the World Nuclear Association estimates as of November 2023, **68 GW of nuclear capacity is under construction**, 9 GW is currently planned and 353 GW is proposed.
  - ❍ **Asia is expected to surpass North America's nuclear power growth** by 2026, reaching a **30% share of global nuclear generation.**
- ➢ **Small Modular Reactor (SMR) Technology:**
  - ❍ The report highlighted that momentum is growing behind **small modular reactor (SMR) technology.**
    - ● SMRs are advanced nuclear reactors that have a **power capacity of up to 300 MW(e) per unit**, which is about **one-third** of the generating capacity of traditional **nuclear power reactors.**
    - ● SMRs, which can produce a **large amount of low-carbon electricity**, are:
      - ■ **Small:** physically a fraction of the size of a conventional nuclear power reactor.
      - ■ **Modular**: making it possible for systems and components to be factory-assembled and transported as a unit to a location for installation.

- ■ **Reactors**: harnessing nuclear fission to generate heat to produce energy.
- ❍ The SMR Technology development and deployment are progressing, but not without challenges. R&D is starting to accelerate.

Glance of India's Power Sector:

- ➢ **Installed Electricity Generation Capacity (Fuelwise) as of May 2023:**
  - ❍ Total Installed Capacity (Fossil Fuel & Non-Fossil Fuel) is 417 GW.
  - ❍ The share of various energy sources in the total Electricity Generation are:
    - ● **Fossil fuel** (including Coal)- **56.8%**
    - ● **Renewable Energy (**including Hydropower**)- 41.4%**
    - ● **Nuclear fuel- 1.60%**

India's Renewable Energy Target:

- ➢ India is set to achieve its short term and long term targets under the **Panchamrit action plan,** like
  - ❍ **Reaching a non-fossil fuel energy capacity of 500 GW by 2030**.
  - ❍ Fulfilling at least **half of its energy requirements via renewable energy by 2030**
  - ❍ **Reducing CO2 emissions by 1 billion tons by 2030**; **reducing carbon intensity below 45 percent by 2030.**
  - ❍ Net-Zero emission target by 2070.
- ➢ In August 2022, India updated its **Nationally Determined Contribution (NDC)** according to which the target to reduce emissions intensity of its **GDP** has been **enhanced to 45% by 2030 from 2005 level.**

What is the International Energy Agency (IEA)?

- ➢ **About:**
  - ❍ The IEA was **created in 1974** by member countries of the **Organisation for Economic Co-operation and Development (OECD)** to help industrialized countries respond to **major 1973-1974 oil crisis**.
    - ● Since then, its work has expanded to cover energy security, economic development, and clean energy.
  - ❍ The IEA is an **autonomous forum** that provides analysis, data, and policy recommendations to help countries provide secure and sustainable energy.

○ The IEA has four main areas of focus: **energy security, economic development, environmental awareness and engagement worldwide.**
○ Headquartered in **Paris, France.**

➤ **Members:**
○ The IEA family is made up of 31 member countries, **13 association countries including India,** and 4 accession countries.
  ● A candidate country to the **IEA must be a member country of the OECD.**

➤ **Major Publications:**
○ **World Energy Outlook reports.**
○ **India Energy Outlook Report.**
○ **World Energy Investment Report.**
○ **The IEA Technology Roadmap and Policy Pathway series.**
○ **The Annual Energy Efficiency Market Report**.
○ **The Energy Technology Perspectives**.

■■■

Note:

International Relations

Highlights

- *India's Act East Policy*
- *Red Sea Disruptions and India's Oil Import Dynamics*
- *MEA's Development Aid*
- *Free Movement Regime*
- *Economic Community of West African States*

India's Act East Policy

Why in News?

Recently, the Ministry of Ports, Shipping and Waterways has flagged off the first batch of **trial Cargo Vessels** from Maia Inland Custom Port in West Bengal to Sultanganj Port in Bangladesh, marking a significant step under **India's Act East Policy,** with a focus on enhancing **Inland Water Transport.**

➤ It has been organised by the **Inland Waterways Authority of India (IWAI)**, marking a new beginning for improved connectivity and cooperation between India and Bangladesh.

THE 13 NATIONAL WATERWAYS NOW IN OPERATION

NW-2	Brahmaputra	Sadiya	
NW-1	Bhagirathi		
NW-1	Ganga	Allahabad	Dhubri
NW-73	Narmada	NW-1 Hooghly	
NW-10	Amba	Haldia	
NW-100	Tapi	NW-97 Sunderbans Waterways	
NW-85	Kundalika		
NW-83	Rajpuri Creek	Vijayawada	
NW-91	Shastri	Muktiyala	
NW-68	Mandovi	NW-4 Krishna	
NW-111	Zuari	NW-3 West Coast Canal, Champakara, Udyogmandal	

THE LINKS AND THE LENGTHS

NW-1	Ganga–Bhagirathi–Hooghly (Haldia-Allahabad)	1,620 km
NW-2	Brahmaputra river	891 km
NW-3	West Coast Canal– Champakara Canal– Udyogmandal Canal	205 km
NW-4	Krishna (Muktiyala–Vijayawada)	82 km
NW-10	Amba river	45 km
NW-83	Rajpuri Creek	31 km
NW-85	Revadanda Creek– Kundalika river	31 km
NW-91	Shastri river-Jaigad Creek System	52 km
NW-68	Mandovi river (Usgaon Bridge– Arabian Sea)	41 km
NW-111	Zuari river (Sanvordem Bridge–Marmugao Port)	50 km
NW-73	Narmada river	226 km
NW-100	Tapi river	436 km
NW-97	Sunderbans Waterways	172 km

What is the Significance of this Trial Shipment?

➤ Operationalization of Maia Terminal is expected to be a game-changer as it would shift 2.6 million tonnes per annum (MTPA) of Bangladesh-bound export cargo from road to waterways.

➤ The Maia-Aricha route (Protocol Route 5 & 6) will reduce the distance from **NW1 (National Waterways 1)** to Bangladesh and the North Eastern Region by 930 kilometres.

Note:

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What is Inland Water Transport (IWT)?

➢ **About:**
  ○ IWT refers to the transportation of goods and passengers via navigable rivers, canals, lakes, and other inland waterways.
  ○ This mode of transport utilises watercraft such as boats, barges, and ships to move cargo and people within a country's interior regions, connecting various ports and terminals along the water routes.

➢ **Significance:**
  ○ IWT is a **highly cost-effective mode of transportation**, particularly for bulk cargo like coal, iron ore, cement, food grains, and fertiliser.
  ○ Despite its advantages, its current share in **India's modal mix is only 2%.** The government aims to increase this **share to 5% by 2030** under the **Maritime India Vision (MIV)-2030.**
    • To achieve this goal, the IWAI has identified 25 new National Waterways (NWs) through feasibility studies to make them navigable for transportation.

What is Act East Policy?

➢ **About:**
  ○ The **'Act East Policy'** announced in November, 2014 is the upgrade of the **"Look East Policy".**
  ○ It is a diplomatic initiative to promote economic, strategic and cultural relations with the vast Asia-Pacific region at different levels.
  ○ It involves **intensive and continuous engagement with Southeast Asian countries** in the field of connectivity, trade, culture, defence and people-to-people-contact at bilateral, regional and multilateral levels.

➢ **Aim:**
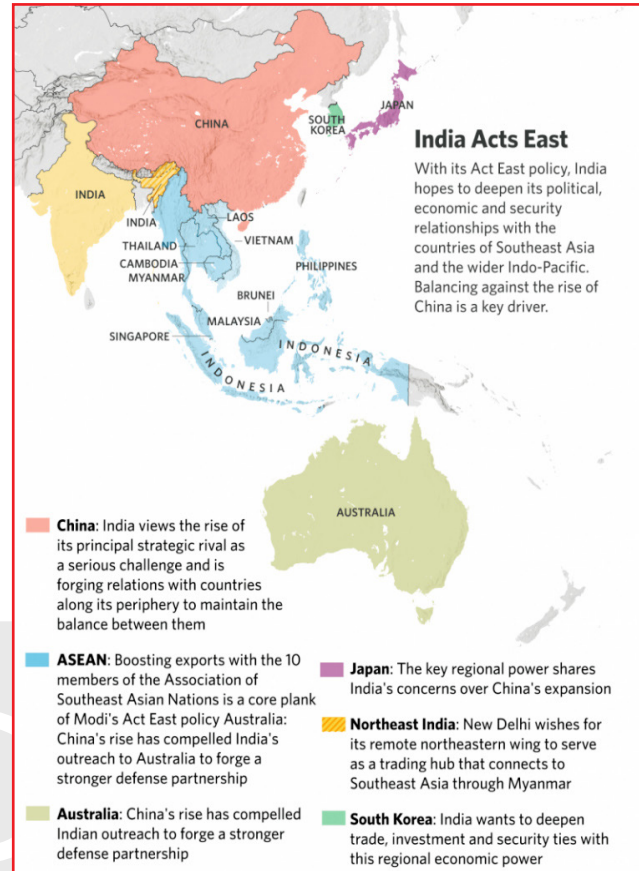 ○ To promote **economic cooperation, cultural ties and developing a strategic relationship** with countries in **Indo-pacific region** with a proactive and pragmatic approach and thereby improving the economic development of the **North Eastern Region (NER)** which is a gateway to the South East Asia Region.

India Acts East

With its Act East policy, India hopes to deepen its political, economic and security relationships with the countries of Southeast Asia and the wider Indo-Pacific. Balancing against the rise of China is a key driver.

China: India views the rise of its principal strategic rival as a serious challenge and is forging relations with countries along its periphery to maintain the balance between them

ASEAN: Boosting exports with the 10 members of the Association of Southeast Asian Nations is a core plank of Modi's Act East policy Australia: China's rise has compelled India's outreach to Australia to forge a stronger defense partnership

Japan: The key regional power shares India's concerns over China's expansion

Northeast India: New Delhi wishes for its remote northeastern wing to serve as a trading hub that connects to Southeast Asia through Myanmar

Australia: China's rise has compelled Indian outreach to forge a stronger defense partnership

South Korea: India wants to deepen trade, investment and security ties with this regional economic power

What is the Look East Policy?

➢ In order to recover from the loss of the strategic partner -**USSR** (end of the **Cold war** 1991), India sought to build up a relationship with the USA and allies of the USA in Southeast Asia.

➢ In this pursuit, former Prime minister of India **P V Narasimha Rao launched Look East policy in 1992,** to give a strategic push to India's engagement with the South-East Asia region, to bolster its standing as a regional power and a counterweight to the strategic influence of the People's Republic of China.

What is the Difference Between Look East Policy and Act East Policy?

➢ **Look East:**
  ○ Look East policy focused on the **Association of Southeast Asian Nations (ASEAN)** countries+Economic Integration.
    • India became a **dialogue partner of ASEAN in 1996** and summit level partner in 2002.
    • In 2012 the relationship got up-graded into a Strategic Partnership.

Note:

- The time when India launched the Look East Policy in 1992, India's trade with ASEAN was USD 2 billion. After signing the Free Trade Agreement in 2010 with ASEAN, the trade has grown to USD 72 billion (2017-18).
- India is also an active participant in several regional forums like the **East Asia Summit (EAS), ASEAN Regional Forum (ARF) etc.**

○ **Act East:**
- Act East Policy focused on **ASEAN countries + Economic Integration + East Asian countries + Security cooperation.**
  - Prime minister of India highlighted **4C's of Act East Policy.**
    - Culture
    - Commerce
    - Connectivity
    - Capacity building
- Security is an important dimension of India's Act East Policy.
  - In the context of growing Chinese assertiveness in the **South China Sea** and the Indian Ocean, securing freedom of navigation and India's own role in the Indian Ocean is a key feature of Act East Policy.
  - In pursuance of this, India has been engaged under the narrative of Indo-pacific and informal grouping called **Quad.**

What are the Initiatives to Enhance Connectivity under Act East Policy?

➢ **Agartala-Akhaura Rail Link** between India and Bangladesh.

➢ Intermodal transport linkages and **inland waterways through Bangladesh.**

➢ **Kaladan Multimodal Transit Transport Project** and the **Trilateral Highway Project** connecting the **North East with Myanmar and Thailand.**

➢ Under **India-Japan Act East Forum,** projects such as Road and Bridges and modernization of Hydro-electric power projects have been undertaken.

○ India-Japan Act East Forum was established in 2017 which aims to provide a platform for India-Japan collaboration under the rubric of India's "Act East Policy" and **Japan's "Free and Open Indo-Pacific Strategy".**

○ The Forum will identify specific projects for economic modernization of India's North-East region including those pertaining to connectivity, developmental infrastructure, industrial linkages as well as people-to-people contacts through tourism, culture and sports-related activities.

➢ **Other Initiatives:**
○ Assistance extended in the form of **medicines/ medical supplies to ASEAN countries during the pandemic.**

○ Scholarships with **offers of 1000 PhD fellowships** have been offered at IITs for ASEAN countries participants.

○ India is also implementing Quick Impact Projects in Cambodia, Laos, Myanmar and Vietnam to provide **development assistance to grass-root level communities** in the fields of education, water resources, health etc.
  - Quick Impact Projects (QIPs) are small-scale, low cost projects that are planned and implemented within a short timeframe.

○ To enhance the modal share of coastal shipping and inland water transport, 46 initiatives have been identified in **Amrit Kaal Vision 2047.**
  - Key initiatives include the creation of port-based agglomeration centres, coastal berths near production/demand centers, and projects to improve road, rail, and inland waterway connectivity.
  - The plan also aims to operationalize 50 waterways by 2047 and introduce low-draft vessel designs with possible tug-barge combinations to enhance efficiency and accessibility.

Red Sea Disruptions and India's Oil Import Dynamics

Why in News?

The recent turmoil in the **Red Sea** has sent ripples through **India's oil import** dynamics, triggering notable changes in its reliance on conventional suppliers like the US.

Why is India Moving its Oil Imports Away from the US?

➢ For a while, the US has consistently ranked among

India's top five crude suppliers, with domestic refiners procuring an average of 205,000 barrels per day (bpd) of crude in 2023.

○ However, recent data indicates that Indian refiners did not acquire any US crude in January 2024.

➢ **Red Sea troubles** escalated **freight rates**, rendering US crude economically unviable for Indian refiners. Consequently, Indian refiners reverted to traditional suppliers in the **Persian Gulf (West Asia).**

○ Recently, Chemical tanker MV Chem Pluto was struck by a drone attack, approximately 200 nautical miles off Gujarat's coast.

● MV Chem Pluto is a Liberia-flagged, Japanese-owned, and Netherlands-operated chemical tanker.

● It had started its journey carrying crude from Al Jubail, Saudi Arabia and was expected to arrive in **New Mangalore, India.**

○ It is believed to have been carried out by **Houthi rebels based in Yemen,** citing protest against Israel's actions in Gaza.

Who are the Top Crude-Oil Suppliers for India?

➢ **Status of Oil Imports:** India currently is the 3rd largest consumer of oil behind the US and China. It imports **85% of its oil needs** and this dependence is likely to rise as domestic production falls.

○ **India will overtake China** as the biggest driver of global oil demand in 2027. Diesel will be the single largest source of demand growth, accounting for almost half of the rise in the nation's demand **(International Energy Agency).**

➢ **Major Oil Suppliers:**

○ **Russia:** Russia is currently **India's largest supplier of oil.** Russian oil imports to India surged to 1.53 million barrels per day (bpd) **in January**, 2024.

● India capitalised on discounted Russian offers following Western sanctions on Russia (due to **Russia-Ukraine Conflict)**, displacing traditional suppliers.

● The **Urals crude oil grade of Russia** has become a cornerstone of India's energy diversification efforts.

Note:

○ **Ira:** Iraq is the **second**-largest source of crude supplier to India, with imports reaching 1.19 million bpd in January 2024, the highest since April 2022.

● India's efforts to diversify oil procurement channels aim to mitigate geopolitical risks and ensure a stable energy supply.

○ **Saudi Arabia**: Saudi Arabia is India's **third**-largest oil supplier and exported approximately 690,172 bpd of crude oil to India in January, 2024 maintaining its position as a key player in India's energy security landscape.

○ **UAE:** Oil imports from the UAE surged by 81% in January, 2024 reaching around 326,500 bpd.

● Abu Dhabi is India's **fourth-largest supplier of crude oil.**

What are Government's Recent Initiatives to Control Surging Oil Demands?

➢ **Managing Demand:**

○ **Promoting Energy Efficiency:** Schemes like **PAT (Perform, Achieve and Trade)** incentivize industries to reduce energy consumption.

● Star labelling for appliances helps consumers choose efficient options.

○ **Fuel Diversification:** Initiatives like the **Ethanol Blending Program (EBP)** aim to blend **20% ethanol with petrol by 2025,** reducing gasoline dependence.

● Similarly, **Compressed Natural Gas (CNG)** is promoted for vehicles.

○ **Electric Mobility: FAME scheme** is a subsidy programme aims to support electrification of public and shared transportation

● By 2030, the government intends to have an electric vehicle (EV) sales penetration of 30% for private cars, 70% for commercial vehicles and 80% for two and three-wheelers.

➢ **Boosting Domestic Production:**

○ **Attractive Exploration Policies:** Production Sharing Contract (PSC) regime, Discovered Small Field Policy, and Hydrocarbon Exploration and Licensing Policy (HELP) aim to attract investments in oil and gas exploration.

○ **Technological advancements:** ONGC is investing in **Enhanced Oil Recovery (EOR)** techniques aimed to extract more oil from existing fields.

MEA's Development Aid

Why in News?

In the recently announced **Interim Budget for the fiscal year 2024-25,** the **Ministry of External Affairs (MEA)** has outlined its development assistance plans, focusing on strategic partners and neighbouring countries.

➢ The MEA's development aid is geared towards **expanding and safeguarding India's global influence and interests,** aligning with foreign policy goals. Additionally, the objective includes **promoting regional connectivity, cooperation, and stability through strategic development assistance.**

How is the Development Aid Distributed Among Countries?

➢ The ministry allocated a total of Rs 22,154 crore for the 2024-25 fiscal year in the Interim budget as against last year's outlay of Rs 18,050 crore.

○ In line with **India's 'Neighbourhood First' policy,** the **largest share** of the aid portfolio has been **granted to Bhutan with an allocation of Rs 2,068 crore** against Rs 2,400 crore in 2023-24.

● **Bhutan** emerges as the frontrunner, receiving a substantial share of the aid portfolio.

○ The development assistance to the **Maldives has been kept at Rs 600** crore as against last year's Rs 770 crore, according to budget papers.

○ In continuation with India's special relationship with the people of **Afghanistan, a budgetary aid of Rs 200 crore** has been set aside for the country.

○ An amount of **Rs 120 crore will be provided to Bangladesh** under development aid while **Nepal would be provided Rs 700 crore.**

○ **Sri Lanka** will get development aid worth **Rs 75 crore, Mauritius** to receive Rs 370 crore while the amount for **Myanmar** has been pegged at Rs 250 crore.

○ A separate amount of **Rs 200 crore has been set aside for African countries.**

○ The total development assistance to various countries and regions such as **Latin America and Eurasia** has been pegged at Rs 4,883 crore.

○ The allocation for **Chabahar Port** has also been maintained at **Rs 100 crore,** underlining India's focus on connectivity projects with Iran.

Note:

What are the Other Development Partnerships of MEA?

➢ **Humanitarian Assistance:**
  ○ The MEA extends **humanitarian assistance to partner countries** in times of <u>natural disasters,</u> emergencies, and <u>pandemics.</u>
    ● India has provided relief supplies, medical teams, and financial assistance to several countries and also supplied medicines, vaccines, and medical equipment to over 150 countries to combat the **Covid-19 pandemic.**

➢ **Cultural and Heritage Cooperation:**
  ○ The MEA promotes cultural and heritage cooperation with partner countries. India's assistance programme more than **50 cultural and heritage projects have been completed,** including the restoration of **Ananda Temple; Shwedagon Pagoda (Myanmar)**, Indian Gallery at **Sacred Tooth Relic Temple, Kandy (Sri Lanka),** renovation of **BalaTiripuraSundari Temple; construction of <u>Dharamshalas-Pashupathinath temple (Nepal)</u>.**
    ● Currently around **25 cultural and heritage projects are under implementation in various countries.**

➢ **Capacity Building and Technical Assistance:**
  ○ India's development partnership prioritises **capacity building, offering civilian and military training, on-site programs,** and expert deputation to friendly nations.
    ● The <u>Indian Technical and Economic Cooperation (ITEC) program</u>, initiated in 1964, spans 160 partner countries, providing **short-term training across diverse disciplines,** witnessing significant growth from 4,000 to 14,000 slots by 2019-20.
      ■ Courses cover areas such as Engineering, Climate Change, Health, and Women Empowerment, contributing to holistic skill enhancement globally.

➢ **Lines of Credit for Development Projects:**
  ○ Development assistance in the **form of concessional <u>Lines of Credit</u> (LOCs)** is extended by India under the **Indian Development and Economic Assistance Scheme (IDEAS)** through the <u>Exim Bank of India</u>.
    ● In total 306 LOCs worth USD 30.59 billion have been extended to 65 countries. The projects under the LOCs cover **critical infrastructure sectors** such as transport, power generation; agriculture; manufacturing industries, healthcare, education and capacity building.

Why is Bhutan Important for India?

➢ Bhutan serves as a **buffer state between India and China,** two Asian giants with complex relations. Bhutan's strategic location provides India with an **additional layer of security** against potential threats from the north.

➢ In 2017, during the <u>**Doklam standoff between India and China**</u>, Bhutan played a crucial role in **allowing Indian troops to enter its territory to resist Chinese incursions.**

➢ India's full support for the socio-economic development of Bhutan is based on its priorities to boost **cross-border connectivity** and expand ties in trade, infrastructure and energy.

➢ The Government of India has committed Rs. 45 billion to **Bhutan's 12th Five Year Plan (2018-2023),** which includes Rs. 28 billion for **Project Tied Assistance (PTA).**
  ○ The **PTA program includes projects in various sectors,** including health, education, culture, livestock development, and infrastructure.

➢ For grassroots development across Bhutan, India has committed to the **High Impact Community Development Projects (HICDPs)/Small Development Projects (SDPs).**
  ○ These are **short gestation small projects** situated in remote parts of Bhutan for the creation of infrastructure such as Farm Roads, livestock centres, water supply and irrigation systems and capacity development at a local level.

➢ Mutually beneficial <u>**hydro-power cooperation with Bhutan**</u> is a key pillar of bilateral economic cooperation. For Bhutan, **hydro-power development** continues to be a **vital catalyst for socio-economic development.**

➢ The ongoing cooperation between India and Bhutan in the hydro-power sector is covered under the 2006 bilateral agreement for cooperation and its Protocol signed in 2009.
  ○ Four hydroelectric projects (HEPs) totalling 2136 MW are already operational in Bhutan and are supplying electricity to India.
  ○ The **720 MW Mangdechhu** was commissioned in August 2019 and handed over to Bhutan in December 2022.

Note:

○ Two HEPs namely, 1200 MW **Punatsangchhu-I,** and 1020 MW **Punatsangchhu-II** in Inter-Governmental mode are under various stages of implementation.

○ The two countries commissioned the first-ever joint venture project the **600 MW Kholongchhu hydropower project**. The project is aimed at generating surplus hydroelectricity for Bhutan which will be exported to India aiding Bhutan's revenue as well as employment generation.

➢ **India is Bhutan's top trade partner** both as an import source and as an export destination.

➢ The two neighbours have a close civilisational, cultural relationship that dates back centuries. **Bhutan considers India as gyagar,** meaning the holy land, as **Buddhism originated in India**, which is the religion followed by the majority of Bhutanese.

India's Neighbourhood First Policy

➢ India's **'Neighbourhood First Policy'** guides its approach towards the management of relations with countries in its **immediate neighbourhood,** that is, **Afghanistan, Bangladesh, Bhutan, Maldives, Myanmar, Nepal, Pakistan and Sri Lanka.**

➢ The Neighbourhood First policy, inter alia, is aimed at **enhancing physical, digital and people-to-people connectivity** across the region, as well as augmenting trade and commerce.

Free Movement Regime

Why in News?

India's recent plans to **review the Free Movement Regime (FMR) agreement with Myanmar and** fence the India-Myanmar border have initiated discussions, especially in the northeastern states.

➢ The decision aims to address a complex intersection of **historical, cultural, and security considerations.**

What is the Free Movement Regime?

➢ **Historical Context:**

○ Much of India's northeast region was under Burmese occupation until the **Treaty of Yandaboo in 1826** established the current India-Myanmar boundary.

● The Treaty of Yandabo was signed b**y General Sir Archibald Campbell on behalf of the British** and Governor of Legaing Maha Min Hla Kyaw Htin on behalf of the Burmese.

■ It ended the **First Anglo-Burmese War (1824-1826).**

○ However, the border separated communities with shared ethnicity and culture, including the **Nagas** in Nagaland and Manipur, as well as the **Kuki-Chin-Mizo communities** in Manipur and Mizoram, without their agreement.

○ Currently, India and Myanmar share a 1,643 km border across **Manipur, Mizoram, Nagaland and Arunachal Pradesh,** of which only 10 km is fenced, in Manipur.

➢ **Free Movement Regime:**

○ The FMR was established in **2018** as part of **India's Act East policy,** promoting cross-border movement up to **16 km** without a visa.

● Individuals residing at the **border need a one-year border pass for stays lasting up to two weeks** in the neighbouring country.

○ It aimed to facilitate **local border trade**, improve access to education and healthcare for border residents, and strengthen diplomatic ties.

➢ **Potential Reasons for Reconsidering the FMR:**

○ **Security Concerns**:

● **Increased Infiltration**: Concerns have arisen about the influx of illegal immigrants, particularly the **Chin, Naga communities and Rohingyas from Myanmar,** potentially straining resources and impacting local demographics.

● **Drug Trafficking and Arms Smuggling**: The porous border facilitates the **illegal movement of drugs and weapons**, posing a threat to internal security to India and fueling crime.

■ In 2022, Manipur witnessed 500 cases filed and 625 individuals arrested under the **Narcotic Drugs and Psychotropic Substances (NDPS) Act,** as per data from the Chief Minister's Office.

● **Insurgency Activities:** The FMR has been misused by **insurgent groups operating in northeastern India**, allowing them to cross the border easily and evade capture.

■ E.g. **Kuki National Organisation** (KNO) and Kangleipak Communist Party-Lamphel (KCP-Lamphel) in Manipur.

○ **Socio-economic and Regional Issues:**

● **Impact on cultural identity:** Concerns exist about the preservation of indigenous culture and traditions in border areas, potentially **threatened by increased migration.**

Note:

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- **Environmental Degradation**: Deforestation and illegal resource extraction along the border are attributed to unregulated cross-border movement.

- **Regional Dynamics**: **China's growing influence in Myanmar** and its potential impact on border security add another layer of complexity to the situation.

What are the Major Aspects of India-Myanmar Relations?

➢ **Historical and Cultural Ties**: India and Myanmar share a long history dating back centuries, with cultural and religious connections deeply rooted in **Buddhism**.
- **Treaty of Friendship, 1951** forms the foundation of their diplomatic relations.

➢ **Economic Cooperation:** India is Myanmar's **4th largest trading partner** and a major source of investment.
- The projects in which India has been involved in Myanmar include the **Kaladan Multimodal Transit Transport Project**, **the Trilateral Highway Project and** restoration and conservation of **Ananda Temple in Bagan (completed in 2018)**.

➢ **Disaster Relief:** India has responded promptly and effectively in rendering assistance following natural calamities in Myanmar like **Cyclone Mora** (2017), earthquake in Shan State (2010) and the outbreak of **influenza virus** **in Yangon** in July-August 2017.

Economic Community of West African States

Why in News?

Recently, the military regimes in **Burkina Faso, Mali and Niger** announced their immediate withdrawal from the **West African bloc Economic Community of West African States (ECOWAS)**.

What is ECOWAS?

➢ **About:** ECOWAS is a regional grouping aimed to promote economic integration and shared development of the **West African sub-region**.
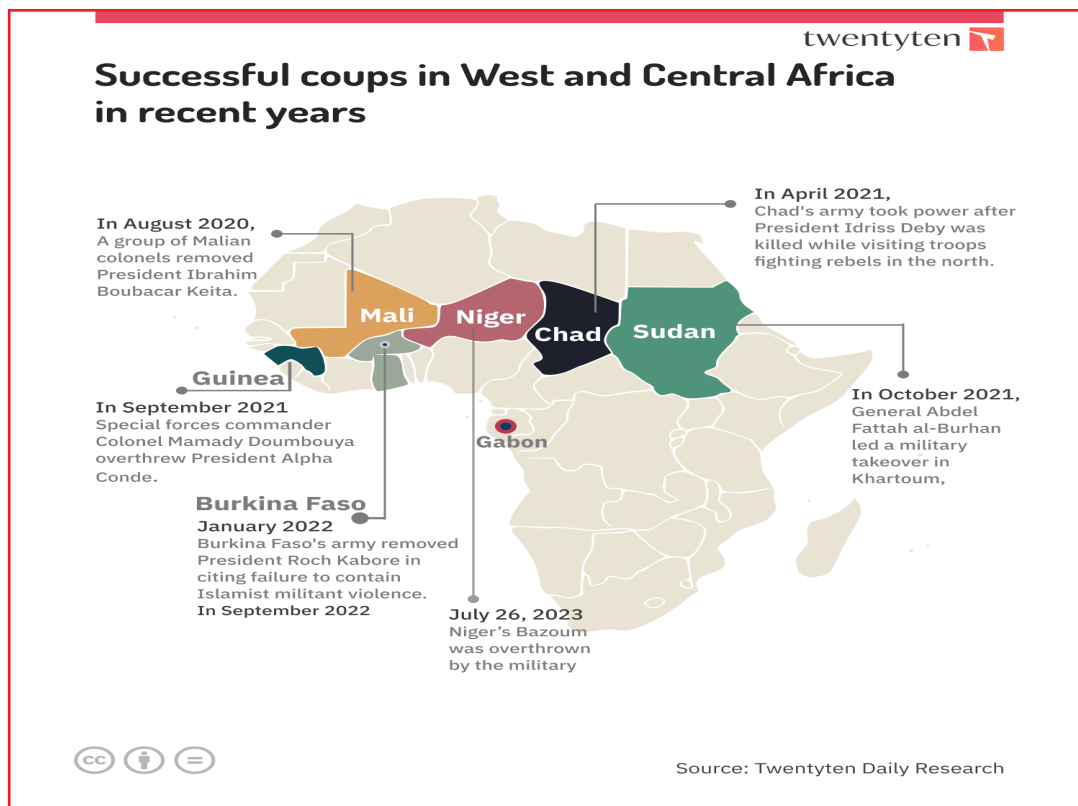- It was established in May 1975 by 15 West African countries in **Lagos, Nigeria.**

- ➤ **Founding members:** Benin, Burkina Faso, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Sierra Leone, Sénégal, and Togo.
- ➤ **Headquarters**: Abuja, Nigeria.
- ➤ **Major Initiatives:** ECOWAS established its **free trade area in 1990** and adopted a common external tariff in January 2015.
  - ○ It has also worked to address some security issues by developing a **peacekeeping force** **for conflicts** in the region.
    - It Troops were initially sent to **Liberia in 1990** during its civil war and to **Sierra Leone in 1997** following the overthrow of a democratically elected government.
- ➤ **India-ECOWAS Relation:**
  - ○ India has a long-standing relationship with ECOWAS and was given the **status of observer to the body in 2004.**
    - In 2006, India gave the grouping a line of credit (LoC) worth **USD 250 million**.
  - ○ ECOWAS has also supported India's bid for a permanent seat in the **United Nations Security Council.**

Successful coups in West and Central Africa in recent years

In August 2020, A group of Malian colonels removed President Ibrahim Boubacar Keita.

In April 2021, Chad's army took power after President Idriss Deby was killed while visiting troops fighting rebels in the north.

Guinea
In September 2021 Special forces commander Colonel Mamady Doumbouya overthrew President Alpha Conde.

In October 2021, General Abdel Fattah al-Burhan led a military takeover in Khartoum,

Burkina Faso
January 2022 Burkina Faso's army removed President Roch Kabore in citing failure to contain Islamist militant violence. **In September 2022**

July 26, 2023 Niger's Bazoum was overthrown by the military

Source: Twentyten Daily Research

Note: Recently the **French military pullout from the Sahel region** has raised concerns about the potential spread of conflicts to **Gulf of Guinea states** such as Ghana, Togo, Benin, and Ivory Coast

Key Points About Sahel Region
➤ **Sahel** is a **semiarid region** of western and north-central Africa extending from **Senegal eastward to Sudan**. ➤ It forms a transitional zone between the **arid Sahara (desert) to the north and the belt of humid savannas to the south.** ➤ It is one of the world's richest, gifted with vast energy and mineral resources such as **oil, gold and uranium.**   ○ However, political instability hinder development progress. ➤ **United Nations (UN)** limits the Sahel to ten (10) countries: **Burkina Faso, Cameroon, The Gambia, Guinea, Mali, Mauritania, Niger, Nigeria, Senegal and Chad.**

Note:

Boundaries of the Sahel within the context of the United Nations
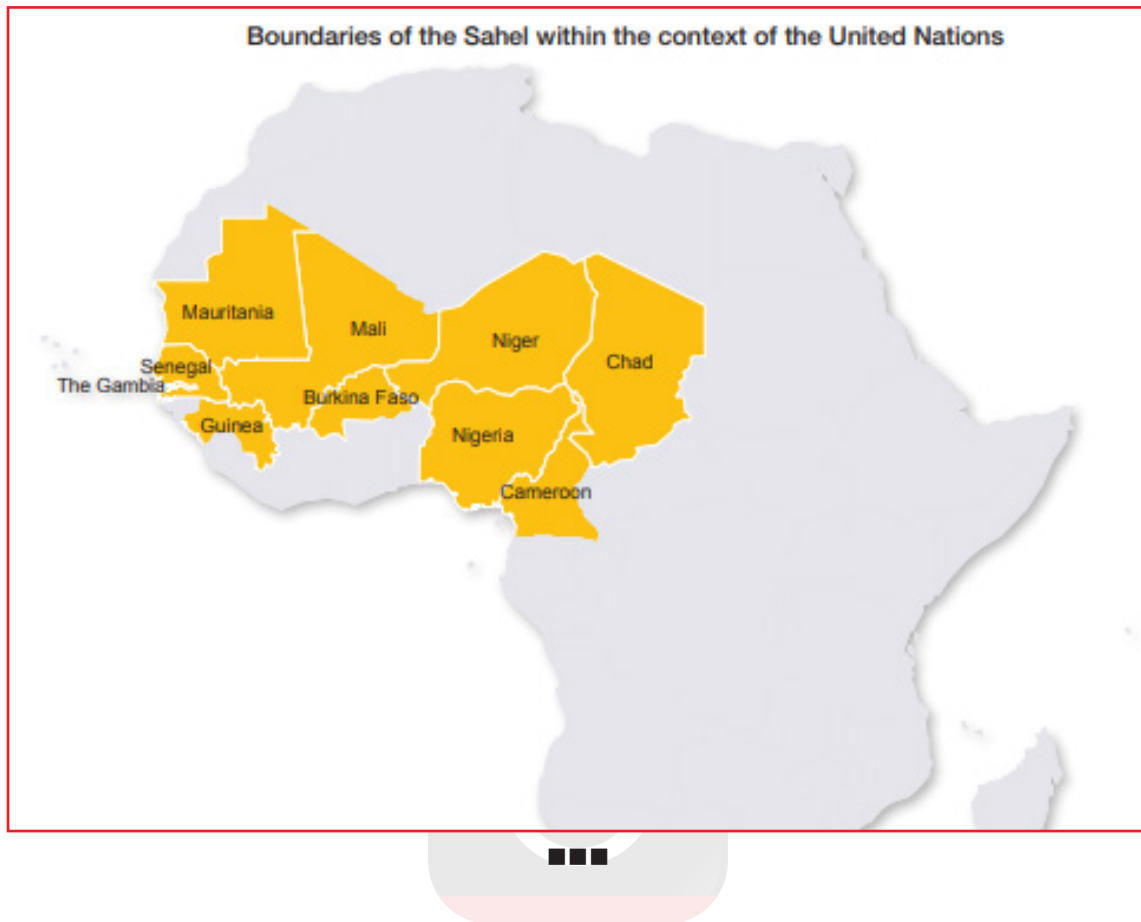
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Social Issues

Highlights

- *Female Genital Mutilation*
- *Lymphatic Filariasis*
- *Building An Inclusive Society Through SMILE*
- *Report on Climate and Catastrophe Insight*

- *Global Burden of Cancer: WHO*
- *World Leprosy Day*
- *EPFO's Employer Rating Survey*

Female Genital Mutilation

Why in News?

Recently, the UN agencies stated that in **2024**, nearly 4.4 million girls are at risk of **female genital mutilation** around the world.

What is Female Genital Mutilation?

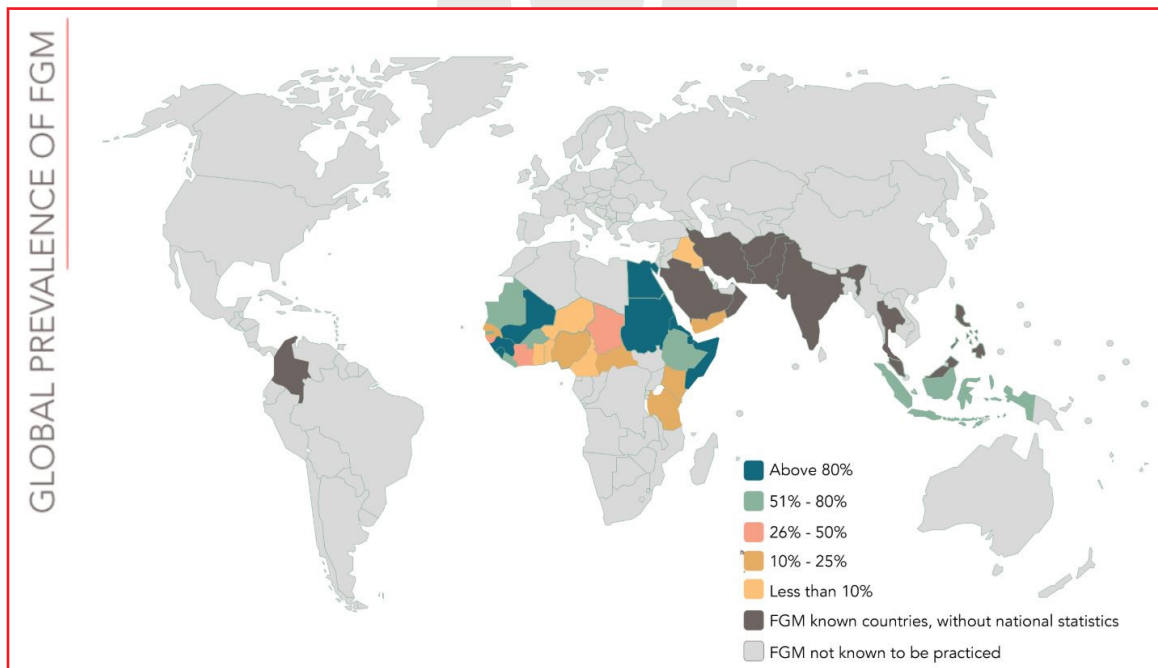➢ **About**: Female genital mutilation (FGM) comprises all procedures that involve altering or **injuring the female genitalia for non-medical reasons** and is recognised internationally as a violation of the human rights, the health and the integrity of girls and women.

➢ **Prevalence**: It is concentrated primarily in **Western, Eastern, and North-Eastern Africa**, as well as select **Middle Eastern and Asian nations**.

○ However, with increased migration, FGM has become a global concern, affecting girls and women in **Europe, Australia, and North America** as well.

GLOBAL PREVALENCE OF FGM

- Above 80%
- 51% - 80%
- 26% - 50%
- 10% - 25%
- Less than 10%
- FGM known countries, without national statistics
- FGM not known to be practiced

➢ **Impacts**: Girls who undergo female genital mutilation face short-term complications such as severe pain, shock, excessive bleeding, infections, and difficulty in passing urine, as well as long-term consequences for their sexual and reproductive health and **mental health.**

➢ **Status in India:** Presently, there is no legislation that bans the FGM practice in the country.

○ In 2017, in response to a petition in the Supreme court, the Ministry of Women and Child Development had said that "**at present there is no official data** or study which supports the existence **of FGM in India**."

Note:

- However, according to some other unofficial reports, procedures of FGM are prevalent amongst the **Bohra community**, primarily in the states of Maharashtra, Kerala, Rajasthan, Gujarat, and Madhya Pradesh.

➤ **Challenges in Eradicating FGM:**

- **Cultural and Social Norms:** FGM is often deeply rooted in cultural and social norms, with communities practicing it as a tradition passed down through generations.
  - Changing these deeply ingrained beliefs and practices can be challenging.
- **Lack of Awareness and Education**: Many individuals within communities where FGM is practiced may not fully understand the harmful consequences of the practice.
  - Lack of awareness and education about the physical and psychological health risks associated with FGM can perpetuate its continuation.
- **Lack of Adequate Data Collection and Reporting:** Limited data collection and reporting on FGM prevalence hinder efforts to understand the scope of the issue and target interventions effectively.

➤ **Global Initiatives Towards Eradication:**

- **United Nations Population Fund** and **United Nations Children's Fund (UNICEF),** have co-led the largest global programme on the elimination of female genital mutilation (FGM) since **2008**.
- In 2012, the UN General Assembly designated **6th February** as the **International Day of Zero Tolerance for Female Genital Mutilation**, with the aim to amplify and direct the efforts on the elimination of this practice.
  - **2024 Theme**: Her Voice. Her Future
- The United Nations strives for its full elimination by **2030**, following the spirit of **Sustainable Development Goal 5**.
  - **SDG 5.3 aims to eliminate all harmful practices,** such as child, early and forced marriage and female genital mutilations.

Lymphatic Filariasis

Why in News?

Recently, the Union Minister of State for Health and Family Welfare launched the first phase of the **Bi-annual Nationwide Mass Drug Administration (MDA) campaign** for **Lymphatic filariasis (LF)** elimination.

> **Note:** The campaign aims to check disease transmission by **providing free preventive medications** to the residents in areas affected by the disease. The campaign will cover 92 districts across 11 states.

What is Lymphatic Filariasis?

➤ **About:**

- Lymphatic filariasis, commonly known as **elephantiasis**, is a **neglected tropical disease(NTD)** caused by infection with **filarial parasites** transmitted through mosquitoes.

➤ **Prevalence:**

- In 2021, approximately 882.5 million people in 44 countries lived in areas requiring preventive chemotherapy to halt the spread of infection.
- LF is a serious public health problem in India. Currently, there are **345 lymphatic filariasis endemic districts in 20 states** and union territories of the country.
  - 75% of MDA districts are from 5 states Bihar, Jharkhand, UP, Odisha and Telangana.
- Lymphatic filariasis is more prevalent among the **urban poor and affects all segments of the rural population.**

➤ **Impact:**

- The infection **starts in childhood and accumulates through adulthood,** resulting in irreversible chronic disease conditions.
  - The disease inflicts stigma, mental suffering, social deprivation and economic loss and is a major cause of poverty in the affected communities.

➤ **Cause and Transmission:**

- **Parasitic Infection:**
  - Lymphatic filariasis is caused by infection with parasites classified as nematodes (roundworms) of the family Filariodidea. There are 3 types of these thread-like filarial worms:
    - ***Wuchereria bancrofti (****r*esponsible for 90% of the cases)
    - ***Brugia malayi (****causes most of the remainder of the cases)
    - ***Brugia timori*** (which also causes the disease)
- **Transmission Cycle:**
  - Adult worms reside in the **lymphatic vessels,** producing microfilariae that circulate in the blood.

- Mosquitoes become infected by biting an infected host and transmit the larvae to humans, perpetuating the transmission cycle.

➢ **Symptoms and Complications:**

○ **Asymptomatic and Chronic Conditions:**

- The majority of infections are asymptomatic, but chronic conditions can lead to **lymphoedema** (swelling of the limbs), **elephantiasis** (thickening of the skin and tissues), and **hydrocele** (swelling of the scrotum), causing **physical disfigurement and psychological distress.**

○ **Acute Episodes:**

- Acute **inflammatory episodes** often accompany chronic conditions, leading to debilitating symptoms and loss of productivity among affected individuals.

➢ **Treatment and Prevention:**

○ **Preventive Chemotherapy:**

- MDA with annual doses of medicines to the at-risk population is the **World Health Organization (WHO)** recommended strategy for eliminating lymphatic filariasis.

- **MDA Regimens:**

  ■ Different drug regimens are recommended based on co-endemicity with other filarial diseases, aiming to **reduce microfilariae density and interrupt transmission.**

- **Morbidity Management:**

  ■ **Surgery, hygiene measures, and clinical care** are essential for managing chronic manifestations and preventing disease progression.

○ **Vector Control:**

- Supplemental strategies such as **mosquito control help reduce transmission** and complement preventive chemotherapy efforts.

➢ **WHO Response and Goals:**

○ **Global Programme to Eliminate Lymphatic Filariasis (GPELF):**

- Launched in 2000, GPELF aims to **eliminate lymphatic filariasis as a public health problem** through preventive chemotherapy and morbidity management.

- In 2020, GPELF set the following goals for the new NTD Road Map (2021–2030):

  ◆ **Validation:** 80% of endemic countries (58) to validate elimination, maintaining low infection rates post-MDA.

  ◆ **Surveillance:** All endemic countries (72) to implement surveillance to prevent disease resurgence.

  ◆ **MDA Reduction:** Targeting zero population needing mass drug administration.

➢ **India's Initiatives:**

○ **Mission Mode India Multi-drug administration (MDA) Campaign** twice a year synchronized with **National Deworming Day (10th Feb and 10th August)**

○ **India is committed to eliminating Lymphatic Filariasis by 2027**, three years before the global target.

LYMPHATIC FILARIASIS — World Health Organization

DISEASE

Infection Filarial parasites spread by mosquitoes

Disease Impairs function of lymphatic vessels

Normal vessels | Dilated vessels

856 Million people **AT RISK**

ELIMINATION

Large-scale treatment of all at-risk populationscan stop spread of infection

Vector control can supplement impact of large-scale treatment

Morbidity management & disability prevention to alleviate suffering due to disease

- 6.7 billon treatments delivered (2000-2016)
- 499 million people no longer require treatment
- Prevented or cured more than 97 million cases
- US$ 100 billion averted lifetime economic loss

Lymphatic Filariasis eliminated as a public health problem in 10 countries

Building An Inclusive Society Through SMILE

Why in News?

In 2021, the **Support for Marginalised Individuals for Livelihood and Enterprise (SMILE) scheme,** aimed at advancing the vision of **Viksit Bharat** was initiated. This included the launch of the **Central Sector Scheme** for Comprehensive Rehabilitation for the Welfare of **Transgender Persons.**

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Who is a Transgender?

➢ According to the **Transgenders Persons Act, 2019,** transgender means a person whose gender does not match with the gender assigned to that person at birth.

➢ It includes trans-person with intersex variations, gender-queer and person having such socio-cultural identities as kinnar, hijra, aaravani and jogta.

➢ India's **2011 Census** was the **first census** in its history to incorporate the number of 'trans' population of the country. The report estimated that 4.8 million Indians identified as transgender.

What is a SMILE Scheme?

➢ **About:**

○ It is a new Scheme after the merger of existing Schemes for Beggars and Transgenders.

● The **two sub-schemes of SMILE** - 'Central Sector Scheme for Comprehensive Rehabilitation for Welfare of Transgender Persons' and 'Central Sector Scheme for Comprehensive Rehabilitation of engaged in the act of Begging' – provide comprehensive welfare and rehabilitation measures to the Transgender community and the people engaged in the act of begging.

■ Scheme provides for the **use of the existing shelter homes available** with the State/UT Governments and Urban local bodies for rehabilitation of the transgender persons.

■ In case of non-availability of existing shelter homes, new dedicated shelter homes are to be set up by the implementing agencies.

➢ **Focus:**

○ The focus of the scheme is extensively on rehabilitation, provision of medical facilities, counselling, basic documentation, education, skill development, economic linkages and so on.

○ It is estimated that an approximate **60,000 poorest persons** would be benefited under this scheme for leading a life of dignity.

● It provides Scholarships for Transgender Students studying in Class 9th and above till post-graduation to enable them to complete their education.

● It has provisions for Skill Development and Livelihood under the **PM-DAKSH scheme.**

● Through Composite Medical Health it provides a comprehensive package in convergence with **Pradhan Mantri Jan Aarogya Yojana (PM-JAY)** supporting Gender-Reaffirmation surgeries through selected hospitals.

● The Housing facility in the form of **'Garima Greh'** ensures food, clothing, recreational facilities, skill development opportunities, recreational activities and medical support etc. to the Transgender community and the people engaged in the act of begging.

➢ **Implementation:**

○ It will be implemented with the support of State/UT Governments/**Local Urban Bodies,** Voluntary Organizations, Community Based Organizations (CBOs) , institutions and others.

○ The **Provision of Transgender Protection Cell** in each state will monitor cases of offences and to ensure timely registration, investigation and prosecution of offences.

○ The **National Portal & Helpline** will provide necessary information and solutions to the Transgender community and the people engaged in the act of begging when needed.

➢ **Scheme for Comprehensive Rehabilitation of Trangenders:**

○ The scheme has been implemented in the selected cities on pilot basis having large concentrations of the Beggar and Transgender community.

○ During the year 2019-20, this Ministry had released an amount of Rs. 1 Crore to **National Institute of Social Defence (NISD)** and Rs. 70 Lakh to **National Backward Classes Finance & Development Corporation (NBCFDC)** for skill development programmes for beggars.

What are the Problems Faced by Transgenders?

➢ **Societal Stigma:**

○ **Social Exclusion:** Transgender individuals often face isolation and marginalization, leading to mental health issues, substance abuse, and a reduced quality of life.

○ **Stereotyping and Misrepresentation:** Society tends to stereotype transgender people, limiting their opportunities for employment, education, and healthcare.

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- ❍ **Family Rejection:** Many transgender individuals are disowned by their families, leaving them without familial support and economic stability.
- ➤ **Discrimination:**
  - ❍ **Violence and Hate Crimes:** Hate crimes, physical and verbal abuse, and sexual assault are significant threats to the safety and well-being of transgender individuals.
  - ❍ **Educational Barriers:** Discrimination in educational institutions hampers access to quality education and future career opportunities.
  - ❍ **Employment Discrimination:** Transgender individuals frequently experience job discrimination, which leads to unemployment or underemployment, perpetuating their economic vulnerability.
  - ❍ **Healthcare Disparities:** Discrimination by healthcare providers often deters transgender individuals from seeking necessary medical care, including gender-affirming procedures.
- ➤ **Absence of Legal Recognition:**
  - ❍ **Legal Ambiguity:** While India has made progress with the Transgender Persons (Protection of Rights) Act, 2019, there are still legal ambiguities and gaps that need to be addressed.
    - ● Transgender persons are not defined properly and the Act does not have any provision for self-determination of gender.
  - ❍ **Lack of Comprehensive Policies:** The absence of comprehensive policies on gender identity, non-binary genders, and a clear legal framework for transgender rights remains a challenge.
  - ❍ **Implementation Gaps:** The implementation of existing laws is often ineffective due to a lack of awareness, prejudice, and reluctance on the part of authorities.

What are the Different Initiatives for Transgender Persons?

- ➤ An MoU has been signed with **National Health Authority** for a specialized Ayushman Bharat TG Plus card for providing more than 50 health benefit services to transgender persons and for first-time gender re-assignment as well as cosmetic treatments have been included under the Ayushman Bharat scheme for transgender persons.
- ➤ **Swachh Bharat Mission(Urban)** has included dedicated toilets for transgender persons in their policy guidelines.

- ➤ **National Portal for Transgender Persons**
- ➤ **Transgender Persons (Protection of Rights) Rules, 2020**
- ➤ **National Council for Transgender Persons**
- ➤ **Certificate of Identity**
- ➤ **Equal Opportunity Policy**

What Can be Done More to Uplift the Transgender Persons?

- ➤ **Transgender-Inclusive Policies:** Legal and the law enforcement systems need to be empowered and sensitized on the issues of Transgender community.
  - ❍ Inclusive approach for Transgender must be planned and adopted by the Government and society.
  - ❍ Their grievance of being not included in policies formulation or decision making needs to be allayed and chances for their public participation should increase.
- ➤ **Addressing Social Concerns:** Provision of free legal aid, supportive education, and social entitlement must be ensured for the Transgender community at ground level as suggested by NALSA Judgement.
  - ❍ Separate policies related to health care must be framed and communicated in all private and public hospitals and clinics.
  - ❍ There is a need to increase awareness and inculcate sense of respect and acceptance for transgender community.
- ➤ **Financial Security:** Liberal credit facilities and financial assistance must be ensured to start up their career as an entrepreneur or businessman along the lines of **SHG-Bank Linkage Programs.**
- ➤ **Transgender in Prisons:** Awareness and documentation are two important tools to address the reforms in reference to sexual minorities, especially trans prisoners.
  - ❍ As the **Commonwealth Human Rights Initiative (CHRI)** advocates, there is a need for a gender-fluid approach for the treatment of transgender prisoners.
  - ❍ The CHRI's recommendations should be considered by the Union government to bring a 'model policy' on the special needs of trans prisoners, through a consultative process with the members of the trans community, to honour the mandate of the **NALSA judgement**.

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Report on Climate and Catastrophe Insight

Why in News?

Recently, the *2024 Climate and Catastrophe Insight* report has been published by a risk-mitigation service provider Aon PLC, which highlighted that the year 2023 recorded significant damages due to <u>**Natural Disasters.**</u>

➢ Aon plc is a leading provider of advice and solutions for commercial, reinsurance, retirement, health, and data & analytic services in over 120 countries and sovereignties.

➢ Their mission is to shape decisions for the better, protecting and enriching the lives of people around the world.

What are the Key Highlights of the Report?

➢ **Increased Damages and Record-Breaking Events:**

○ In 2023, the world witnessed **398 notable natural disasters**, resulting in a staggering USD 380 billion in economic losses.

○ These losses surpassed the **estimated economic loss in 2022** and marked the hottest year on record, underscoring the urgent need for better disaster preparedness, risk reduction, and increased resilience.

➢ **Weather-Related Factors and Vulnerabilities:**

○ 95% of the natural disasters (that occurred in 2023) causing damages exceeding USD 1 billion were attributed to **Weather-related factors.**

○ From extreme heat to severe storms and earthquakes, these events highlight the threat **posed by catastrophe risk** to our lives and livelihoods.
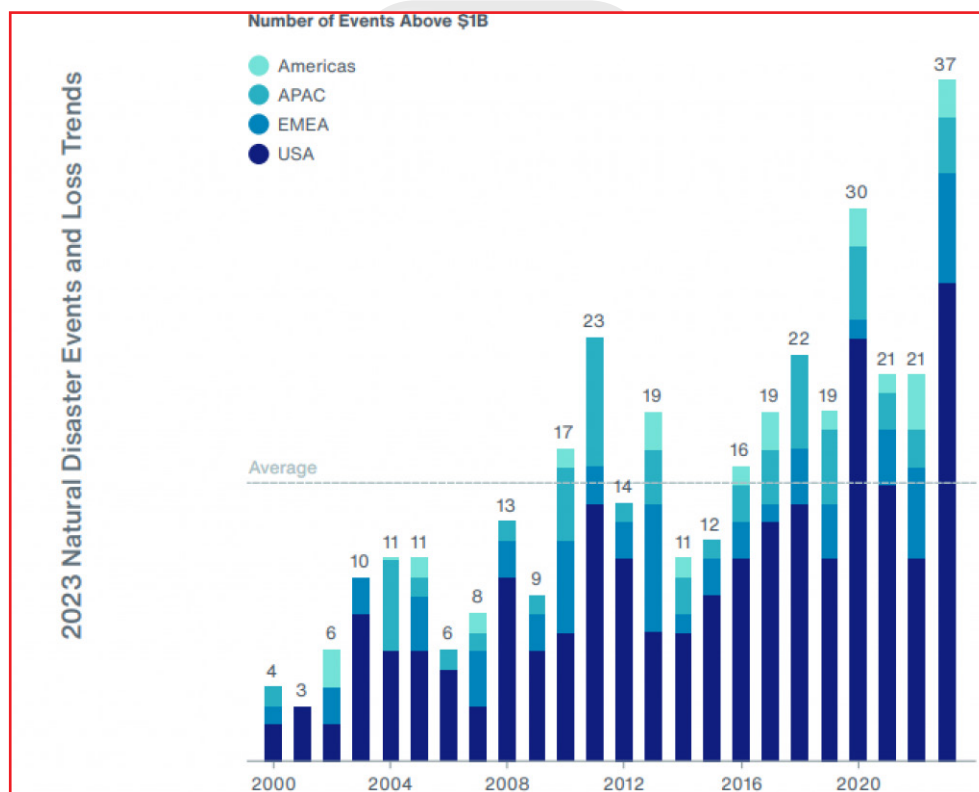
➢ **Protection Gap and Insurance Coverage:**

○ Insurance only paid out USD 118 billion, or 31%, of the total damages incurred indicating a significant **"protection gap"** of approximately 69% as opposed to 58% in 2022.

○ The majority of disaster losses were covered in the US, whereas most of the losses in three other regions — **Americas (Non-US), Europe, Middle East and Africa (EMEA) and Asia and Pacific (APAC)** — were **uninsured.**

● The widest protection gap of around 91% existed in the APAC region, followed by 87% for non-US Americas and the EMEA.

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➤ **Global and Regional Insights:**

  ○ **US:** Economic losses from natural disasters reached USD 114 billion, with insurance covering 70%. **Severe convective storms (SCS)** contributed significantly to the financial toll.

    ● **Convective storms or thunderstorms** are severe local storms associated with thunder, lightning, heavy rain, hail, strong winds and sudden temperature changes. They can occur all year round but are **most common during summer.**

  ○ **Americas (Non-US):** Insurance covered only USD 6 billion of the USD 45 billion in economic losses.

    ● **Hurricane Otis occurred in Mexico's southern Pacific coast,** stood out as the costliest individual event.

    ● Drought impacted **several regions in South America.**

  ○ **Europe, Middle East, and Africa (EMEA):** The region faced USD 150 billion in economic losses due to natural catastrophes, driven by devastating earthquakes.

    ● The **Turkey and Syria earthquake** had a significant impact.

  ○ **Asia and Pacific:**

    ● Economic losses hit USD 65 billion with a protection gap of 91% as insurance losses reached USD 6 billion.

    ● Flooding events resulted in USD 1.4 billion of insured losses in China and USD 1.3 billion in New Zealand. A multi-week-long heatwave impacted many countries in South and Southeastern Asia.

➤ **Recommendations:**

  ○ There is a need to use climate analytics as catalysts that can provide **forward-looking diagnostics** for a range of extreme events.

  ○ There is a need for the organisations – from **insurers to highly impacted sectors** such as construction, agriculture and real estate — to utilise forward-looking diagnostics to help **analyse climate trends and mitigate the risk,** as well as protecting their own workforces.

  ○ The insurance industry can play a pivotal role in **unlocking and speeding up the flow of capital into green investments** and volatility management through innovative risk transfer programmes.

What is the Significance of Disaster Preparedness, Risk Management, and Resilience-Building?

➤ **Disaster Preparedness:** It refers to proactive measures **taken before a disaster occurs** to enhance readiness and response.

  ○ **Early Warning Systems:** Preparedness involves setting up **efficient early warning systems.** These systems provide timely alerts about impending disasters (e.g., cyclones, floods, earthquakes), allowing people to evacuate and take necessary precautions.

  ○ **Training and Drills:** Regular training sessions and mock drills prepare emergency responders, healthcare professionals, and the public to **handle crises effectively.**

  ○ **Stockpiling Supplies:** Preparedness includes **stockpiling essential supplies** (food, water, medicines) to meet immediate needs during disasters.

  ○ **Community Awareness:** Educating communities about disaster risks and preparedness measures fosters a culture of safety and resilience.

➤ **Risk Management:** It involves identifying, assessing, and mitigating risks associated with disasters.

  ○ **Risk Assessment:** By analysing vulnerabilities, exposure, and potential impacts, risk management helps prioritise actions.

  ○ **Risk Reduction Strategies:** Implementing structural (e.g., building codes) and non-structural (e.g., land-use planning) measures reduces vulnerability.

  ○ **Financial Protection:** Insurance and risk financing mechanisms provide financial resilience against losses.

  ○ **Climate Adaptation:** Risk management integrates climate change adaptation strategies to address evolving risks.

➤ **Resilience-Building:** Resilience refers to a community's ability to bounce back after a disaster.

  ○ **Social and Psychological Resilience:** Strengthening social networks, community cohesion, and mutual support enhances resilience. Mental health support and coping mechanisms help individuals recover from trauma.

  ○ **Economic and Infrastructural Resilience:** Diversifying livelihoods, promoting local businesses, and creating

Note:

employment opportunities contribute to economic resilience. Building robust infrastructure (roads, bridges, utilities) that can withstand shocks is vital.

❍ **Environmental Resilience:** Conserving ecosystems (forests, wetlands) contributes to overall resilience.

What is the Role of Insurance Coverage in Mitigating Economic Losses?

➢ **Safety Net in Difficult Times:**

❍ High **Inflation** and economic volatility can lead to **unexpected financial losses** and during such periods, insurance acts as a safety net.

❍ For instance, repairing or rebuilding damaged property is now more expensive due to increased costs of building materials and services. Labour shortages and disrupted supply chains can further delay repairs.

● Insurance coverage ensures **that individuals and businesses are financially protected** against such losses. Without coverage (or with inadequate coverage), the financial burden can be devastating.

➢ **Increased Risk Awareness:**

❍ Financial shocks prompt consumers to **become more cautious and aware of risks.**

❍ Insurance companies can capitalise on this by emphasising their value in managing inflation risk and providing financial security.

❍ By offering timely payouts, **insurers help businesses and individuals recover faster,** allowing economic activities to resume after catastrophes.

➢ **Economic Development and Stability:**

❍ Insurance turns accumulated capital into productive investments. It enables businesses to mitigate losses, maintain financial stability, and promote trade and commerce activities.

❍ A robust insurance sector contributes to sustainable economic growth.

➢ **Disaster Mitigation and Risk Reduction:**

❍ Insurance companies increasingly contribute to disaster mitigation by encouraging policyholders to invest in risk reduction measures. By incentivizing long-term thinking, insurers play a role in reducing overall risks.

❍ For example, **PMFBY (Pradhan Mantri Fasal Bima Yojana)** offers financial protection to farmers against crop losses due to **natural calamities such as droughts,** floods, cyclones, pests, and diseases.

● By providing timely compensation for crop damages, PMFBY helps farmers recover from losses and reduces their vulnerability to economic shocks triggered by disasters.

What are the Initiatives for Disaster Risk Reduction?

➢ **Global:**

❍ **Sendai Framework for Disaster Risk Reduction 2015-2030**

❍ **The Climate Risk and Early Warning Systems (CREWS)**

❍ **International Day for Disaster Risk Reduction - 13th October**

❍ Green Climate Fund's Sectoral Guide on Climate Information & Early Warning Systems

➢ **India's Initiatives:**

❍ **Coalition for Disaster Resilient Infrastructure Society (CDRIS)**

❍ **National Disaster Management Plan (NDMP)**

Global Burden of Cancer: WHO

Why in News?

Ahead of **World Cancer Day (4th February)**, the **World Health Organization (WHO)'s** cancer agency, the **International Agency for Research on Cancer** (IARC), released the latest estimates of the Global Burden of **Cancer** in 2022.

➢ The IARC estimates highlighted the growing burden of cancer, the disproportionate impact on underserved populations, and the urgent need to address cancer inequities worldwide.

What are the Key Highlights of the Global Burden of Cancer in 2022 by WHO?

➢ **Global Burden:**

❍ In 2022, there were an estimated **20 million new cancer cases and 9.7 million deaths**.

❍ The estimated number of people alive within 5 years following a cancer diagnosis was 53.5 million.

● About 1 in 5 people develop cancer in their lifetime.

➢ **Common Cancer Types:**

❍ 10 types of cancer collectively comprised around **two-thirds of new cases** and deaths globally in 2022.

Note:

○ **Lung cancer was the most commonly** occurring cancer worldwide with 2.5 million new cases accounting for **12.4% of the total new cases**.

○ **Female breast cancer ranked second (2.3 million cases, 11.6%)**, followed by colorectal cancer, prostate cancer, and stomach cancer.

➤ **Leading Causes of Death:**

○ **Lung cancer was the leading** cause of cancer death (1.8 million deaths, 18.7% of the total cancer deaths) followed by **colorectal cancer (900 000 deaths, 9.3%)**, **liver cancer,** breast cancer and stomach cancer.

● **Lung cancer's re-emergence as the most common cancer** is likely related to persistent tobacco use in Asia.

➤ **Cancer Inequities:**

○ There have been striking inequities in the cancer burden according to human development. This is particularly true for breast cancer.

○ In countries with a very high **HDI (Human Development Index),** 1 in 12 women will be diagnosed with **breast cancer in their lifetime** and 1 in 71 women die of it.

● By contrast, in **countries with a low HDI**; while **only one in 27 women is diagnosed** with breast cancer in their lifetime, **one in 48 women will die from it.**

○ Women in **lower HDI countries are 50% less likely to be diagnosed with breast cancer** than women in high HDI countries, yet they are at a much higher risk of dying of the disease due to late diagnosis and inadequate access to quality treatment.

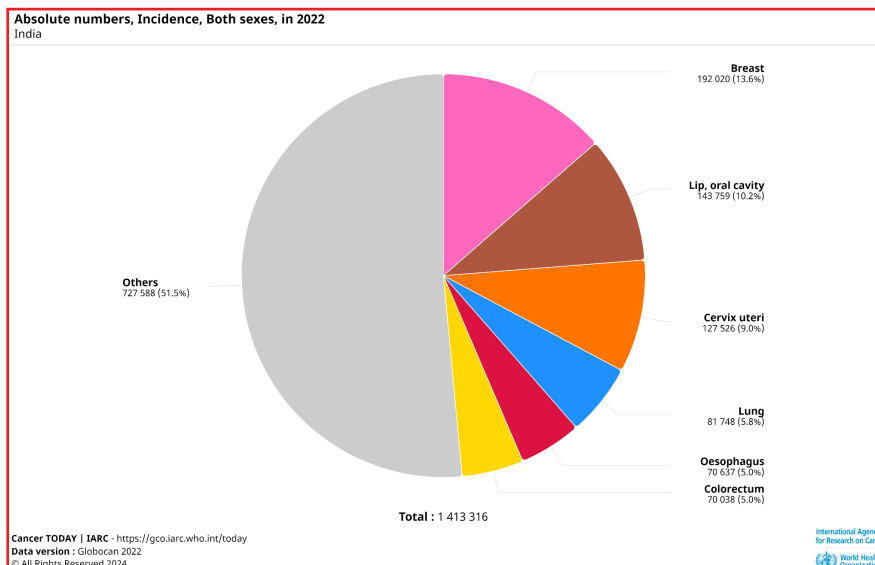➤ **Projected Burden Increase:**

○ Over **35 million new cancer cases are predicted in 2050,** a 77% increase from the estimated 20 million cases in 2022.

○ The rapidly growing global cancer burden reflects both population ageing and growth, as well as **changes to people's exposure to risk factors,** several of which are associated with **socioeconomic development.**

● **Tobacco, alcohol and obesity are key factors** behind the increasing incidence of cancer, with **air pollution still a key driver** of environmental risk factors.

○ In terms of the absolute burden, **high HDI countries are expected to experience the greatest absolute increase** in incidence, with an additional 4.8 million new cases predicted in 2050 compared with 2022 estimates.

➤ **Call for Action:**

○ There is an urgent **need for major investments to address global inequities i**n cancer outcomes and to ensure access to affordable, quality cancer care for all individuals regardless of their geographical location or socioeconomic status.

What are the Key Findings Related to India?

➤ India reported 1,413,316 new cases in 2022 with a **higher proportion of female patients** — 691,178 men and 722,138 women.

Absolute numbers, Incidence, Both sexes, in 2022
India

Breast
192 020 (13.6%)

Lip, oral cavity
143 759 (10.2%)

Cervix uteri
127 526 (9.0%)

Lung
81 748 (5.8%)

Oesophagus
70 637 (5.0%)

Colorectum
70 038 (5.0%)

Others
727 588 (51.5%)

Total : 1 413 316

Cancer TODAY | IARC - https://gco.iarc.who.int/today
Data version : Globocan 2022
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International Agency
for Research on Cancer

World Health
Organization

Note:

- **Breast cancer had the highest proportion in the country,** with 192,020 new cases, accounting **for 13.6% of all patients** and **over 26% in women.**
- In India**, breast cancer was followed by lip and oral cavity** (143,759 new cases, 10.2%), cervix and uterine, lung, and oesophagal cancers.
  - A recent study by **WHO assessing the cancer burden** in Asia, published in **The Lancet Regional Health**, found that **India alone accounted for 32.9% of global deaths** and 28.1% of new cases of lip and oral cavity cancer in 2019.
  - This was on account of the widespread **consumption of smokeless tobacco (SMT) such as khaini, gutkha, betel quid** and paan masala in South Asian countries like India, Bangladesh and Nepal. Worldwide, **SMT is responsible for 50% of the oral cancer burden.**
- As per the Lancet Global Health 2023, **India accounted for 23% of deaths that occurred due to cervical cancer globally**.
  - I**n India, cervical cancer's five-year survival rate was 51.7%**. However, survival rates in India are lower compared to high-income countries such as the United States.

What are the Key Facts Related to World Cancer Day?

- **About:**
  - World Cancer Day is an international awareness day led by the **Union for International Cancer Control (UICC)** celebrated on 4th February every year.
    - Cancer is caused by an uncontrolled, abnormal growth of cells in the body that causes lump or tumour in most causes.
  - It was first celebrated on 4th February 2000 at the **World Summit Against Cancer** for the New Millennium in Paris.
    - The **Paris Charter's mission** is to promote research, prevent cancer, improve patient services, raise awareness and mobilise the global community to make progress against cancer, and includes the adoption of **World Cancer Day.**
- **Theme 2024:**
  - **Close the Care Gap.**
    - The **theme aims to mobilise** the necessary attention and resources to ensure that the rising burden of cancer can be addressed in an equal manner across the globe and that all people in the world have access to **systematic testing, and early diagnosis and treatment.**

Cancer

- It is a complex and broad term used to describe **a group of diseases characterised by the uncontrolled growth and spread of abnormal cells** in the body.
  - These **abnormal cells, known as cancer cells,** have the ability to invade and **destroy healthy tissues and organs.**
- In a healthy body, cells grow, divide, and die in a regulated manner, allowing for the normal functioning of tissues and organs.
  - However, in the **case of cancer, certain genetic mutations or abnormalities disrupt this normal cell cycle,** causing cells to divide and grow uncontrollably.

Cervical Cancer

- **Cervical cancer** develops in a **woman's cervix (the entrance to the uterus from the vagina).**
- Almost all cervical cancer cases (99%) are linked to infection with high-risk **human papillomaviruses (HPV),** an extremely common virus transmitted through sexual contact.
  - Two HPV types (16 and 18) are responsible for nearly **50% of high grade cervical pre-cancers.**
- **Cervical cancer is the fourth most common cancer among women globally.** About 90% of the new cases and deaths worldwide in 2020 occurred in low- and middle-income countries.

What are the Government Initiatives related to Cancer?

- The **interim Budget 2024-25 encouraged the vaccination of girls aged 9-14 years to prevent cervical cancer.**
- **National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke**
- **National Cancer Grid**
- **National Cancer Awareness Day**
- **HPV Vaccine**

World Leprosy Day

Why in News?

World Leprosy Day is observed every year on the last Sunday of January. In **India, it is observed on 30th January every year,** coinciding with the **death anniversary of Mahatma Gandhi.**


Note:

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What is the Purpose of World Leprosy Day Observation?

➢ The theme for **World Leprosy Day 2024 is "Beat Leprosy".** This theme encapsulates the dual objectives of the day: to eradicate the **stigma associated with leprosy** and to **promote the dignity of people affected by the disease.**

➢ The primary objective of the day is to raise awareness among the general public about the stigma associated with leprosy.

➢ Educating people that leprosy is caused by a **specific bacteria and is easily treatable** forms a crucial part of the awareness campaign.

What is Leprosy?

➢ **About:**
  ○ Leprosy, also known as **Hansen's disease**, is a **chronic infectious disease** caused by a type of bacteria called "*Mycobacterium leprae"*.
  ○ The disease affects the **skin, the peripheral nerves, mucosal surfaces** of the upper respiratory tract and the eyes.
  ○ Leprosy is known to occur at **all ages ranging from early childhood to old age.**
  ○ Leprosy is not inherited, but it is **transmitted via droplets, from the nose and mouth,** during close and frequent contact with untreated cases.
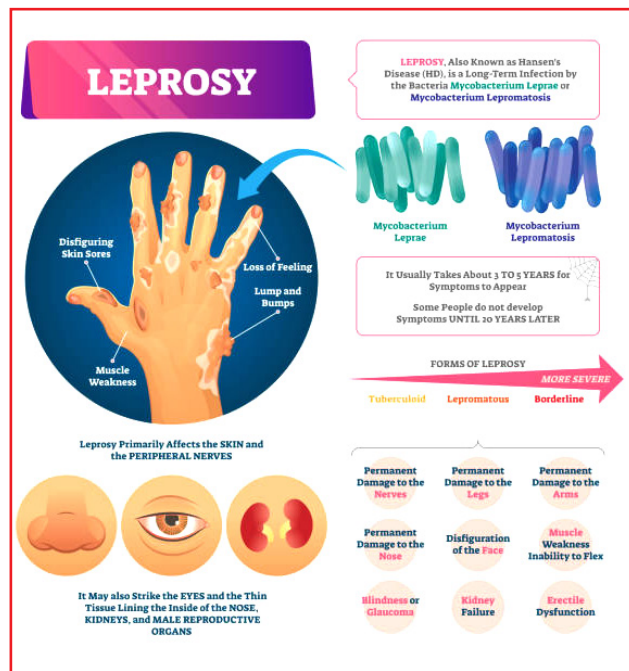
➢ **Classification:**
  ○ **Paucibacillary (PB)** and **multibacillary (MB)** are classifications of leprosy.
    • PB leprosy includes all **smear-negative cases (smaller bacterial load),** while MB leprosy includes all **smear-positive (more infectious compared to smear-negative PTB) cases.**

➢ **Treatment:**
  ○ Leprosy is **curable and treatment during early stages can prevent disability.**
    • The currently recommended treatment regimen consists of three drugs: **dapsone, rifampicin and clofazimine.** The combination is referred to as **multi-drug therapy (MDT).**
    • MDT has been made available through the **World Health Organization (WHO)** free of cost to all patients worldwide since 1995.

➢ **Global Burden of Leprosy:**
  ○ Leprosy is a **neglected tropical disease (NTD)** that still occurs in more than 120 countries, with more than 200,000 new cases reported every year.
  ○ In 2022, **182 countries reported over 1.65 lakh cases** of leprosy, including 174,087 new cases.
  ○ According to the WHO, most countries with high rates of new leprosy cases are in the **WHO African and South-East Asia Regions.**

➢ **India and Leprosy:**
  ○ India has achieved the **elimination of leprosy as a public health problem** as per WHO criteria of less than **1 case per 10,000 population at the National level in 2005.**
    • Leprosy is **endemic in several states and union territories of India.**
  ○ The prevalence rate of leprosy is 0.4 per 10,000 population in the country.

➢ **Initiatives Taken:**
  ○ **Global:**
    • **The Global Leprosy Strategy:**
      ■ In **2016 WHO** launched the **Global Leprosy Strategy 2016–2020,** which aims to reinvigorate efforts to **control leprosy and avert disabilities,** especially among children still affected by the disease in endemic countries.
    • **Global Partnership for Zero Leprosy (GPZL):**
      ■ The Global Partnership for Zero Leprosy is a **coalition of individuals and organizations** committed to ending leprosy.
    • **World Leprosy Day.**

Note:

- **India:**
  - **National Strategic Plan (NSP) & Roadmap for Leprosy (2023-27):**
    - It is launched to achieve **zero transmission of leprosy by 2027** i.e. three years before the **Sustainable Development Goal** (SDG) 3.3.
  - SDG 3.3 is by 2030, **to end the epidemics** of **AIDS, tuberculosis, malaria** and **neglected tropical diseases** and combat hepatitis, water-borne diseases and other communicable diseases.
  - **National Leprosy Eradication Programme (NLEP):**
    - The NLEP is a **Centrally Sponsored Health Scheme introduced in 1983** and it has been implemented with the major objective of reducing the **disease burden, prevention of disability and improving awareness** among the masses about Leprosy and its curability.

Neglected Tropical Diseases (NTDs)

- NTDs are a diverse group of conditions caused by a **variety of pathogens** (including **viruses, bacteria, parasites, fungi** and **toxins**) and associated with devastating health, social and economic consequences.
  - NTDs are most common among marginalized communities in the developing regions of Africa, Asia and the Americas.
- It is estimated that **NTDs affect more than 1 billion people,** while the number of people requiring NTD interventions (both preventive and curative) is 1.6 billion.
- Few examples of NTDs include: **Buruli ulcer; Chagas disease; dengue chikungunya; and lymphatic filariasis.**

EPFO's Employer Rating Survey

Why in News?

Recently, the **Employees' Provident Fund Organisation (EPFO)** and the **Ministry of Women and Child Development (MoWCD)** have jointly launched the **Employer Rating Survey** to assess and encourage employers' support for increasing women's participation in the workforce.

What is an Employees' Provident Fund Organisation?

- It is a government organization that manages provident fund and pension accounts for the workforce engaged in the **organised sector in India.**
- It implements the Employees' Provident Fund and Miscellaneous Provisions Act, 1952.
  - The Employees' Provident Fund and Miscellaneous Provisions Act, 1952 provides for the institution of provident funds for employees in factories and other establishments.
- It is **administered by the Ministry of Labour & Employment**, Government of India.
- It is **one of the World's largest Social Security Organisations** in terms of clientele and the volume of financial transactions undertaken.

What are the Key Aspects of the Employer Rating Survey?

- **About:**
  - The employer rating survey was launched at an event **"Women in the Workforce for Viksit Bharat"** by the EPFO (Ministry of Labour and Employment) and the MoWCD.
  - The survey's data and feedback from female employees aim to offer valuable insights for informed policymaking on women's workforce participation.
  - The primary objective of the **survey is to evaluate and rate employers** based on their commitment and support for women's participation in the workforce. This involves **assessing the measures and facilities provided by employers** to create an environment conducive to women's employment.
- **Rating Employers:**
  - The survey involves rating employers based on **their support for women's participation** in the workforce. It serves as a tool to **gauge the progress and efforts of employers** in creating an inclusive work environment.
- **Questionnaire:**
  - The survey has a detailed **questionnaire seeking organisation detail**s, including whether the company provides an **Internal Complaints Committee** for addressing **Prevention of Sexual Harassment (POSH)** formalities, crèche facilities for children, and **transportation facilities during late hours.**

Note:

- The EPFO has distributed the questionnaire to its approximately 300 million customers nationwide, making it a comprehensive effort to gather data on a large scale.

➢ **Equal Pay for Equal Work:**
  ○ The survey has also sought **answers on whether there is 'equal pay for equal work'** for male and female workers along with a query on the availability of flexible or remote working hours for women.

Note: As per the EPFO's Annual Report for 2022-23, there are 29.88 crore members across 21.23 lakh establishments under the ambit of the retirement fund body.

What is the State of Women's Labour Force Participation in India?

➢ Women's **Labour Force Participation Rate (LFPR)** has improved over the last few years but much of this increase has been seen in the **unpaid work category.**
  ○ LFPR is the percentage of the working-age population (aged 15 years and above) that is either employed or unemployed, but willing and looking for employment.

➢ As per the **Periodic Labour Force Survey (PLFS),** the female participation rate rose to 27.8% in 2022-23 from 17.5% in 2017-18, but a **major chunk of this is of the women** reported as "helpers in household enterprises", who do **not receive any regular salary for their work.**
  ○ **LFPR for male** in India increased from 75.8% in 2017-18 to 78.5% in 2022-23 and corresponding increase in **LFPR for females** was from **23.3% to 37.0%.**

INTERIM BUDGET 2024-25

Rise in Female Labour Force Participation Rate leading to women-led development

23.3% (2017-18)   37% (2022-23)

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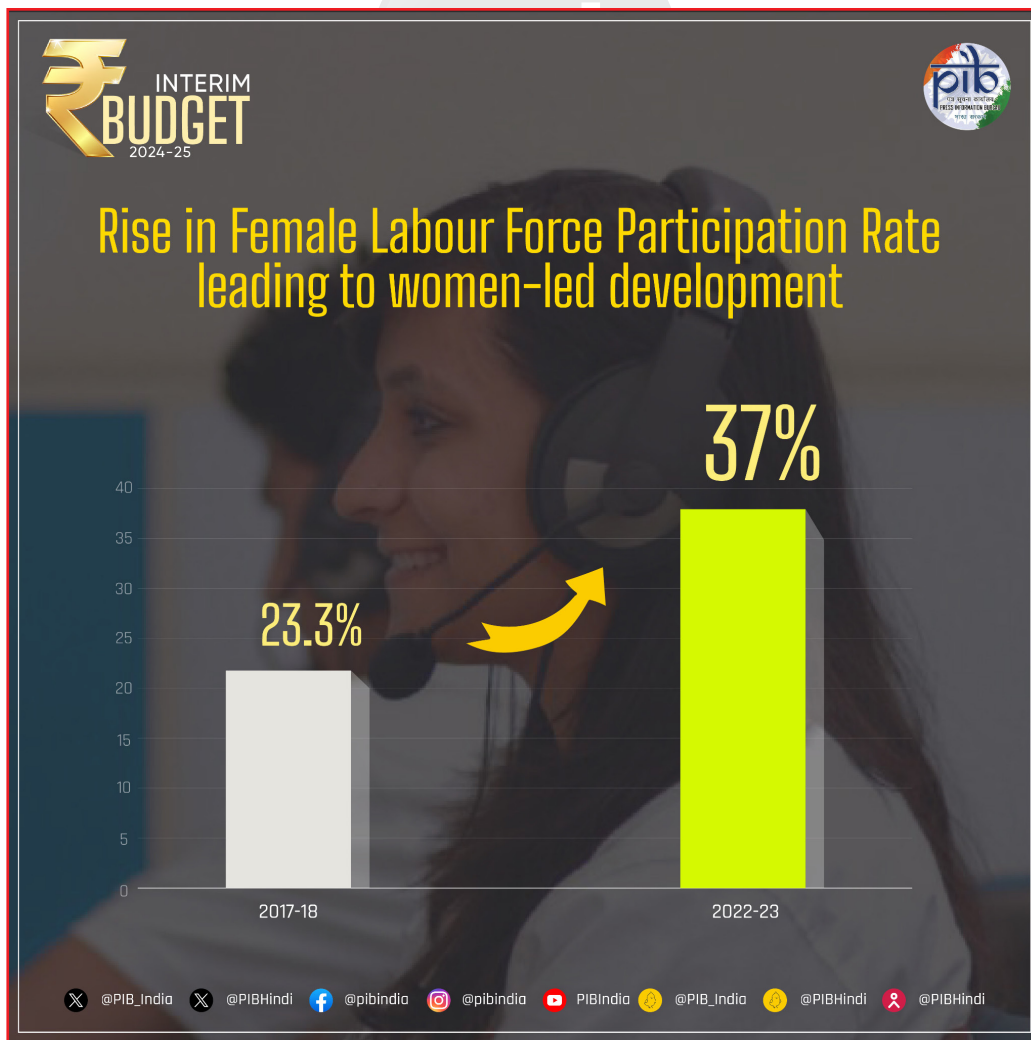
Note:

What are the Causes of Lower Women's Participation in the Labour Force?

➢ **Patriarchal Social Norms:**
   ○ Deep-rooted **patriarchal norms and traditional gender roles** often limit women's access to education and employment opportunities.
   ○ Societal expectations may **prioritise women's roles as caregivers** and homemakers, discouraging their active participation in the labour force.

➢ **Gender Wage Gap:**
   ○ Women in India often face wage disparities compared to men for similar work.
      ● According to **World Inequality Report, 2022**, men in India capture 82% of labour income, while women earn just 18%.
   ○ This wage gap can discourage women from seeking formal employment opportunities.

➢ **Unpaid Care Work:**
   ○ The burden of unpaid care and **domestic work falls disproportionately on women,** limiting their time and energy for paid employment.
      ● Married women in India spend over 7 hours per day on unpaid care and domestic work, while men spend less than 3 hours.
      ● This trend is consistent across income levels and caste groups, leading to **a significant Gender Disparity** in domestic responsibilities.
   ○ This unequal distribution of household responsibilities can be a significant barrier to women's participation in the labor force.

➢ **Social and Cultural Stigma:**
   ○ In some communities, there may be stigma or **resistance associated with women working outside the home**, leading to lower labour force participation rates.

How can Higher Women Labor Participation Impact the Society at Large?

➢ **Economic Growth:**
   ○ Women's participation in the labour force is **directly linked to economic growth.** When a significant portion of the female population remains underutilised, it results in **a loss of potential productivity and economic output.**
   ○ Increased women's labour force participation can contribute to higher **GDP (Gross Domestic Product)** and overall economic prosperity.

➢ **Poverty Reduction:**
   ○ When **women have access to income-generating opportunities**, it can lift households out of poverty, **leading to better living standards** and improved well-being for families.

➢ **Human Capital Development:**
   ○ Educated and economically active women can **positively influence the education and health outcomes of their children,** leading to intergenerational benefits.

➢ **Gender Equality and Empowerment:**
   ○ Higher women's participation in the labour force **can challenge traditional gender roles and norms**, promoting gender equality.
   ○ Economic empowerment enables women to have greater control over their lives, **decision-making power, and autonomy.**
      ● Economic empowerment can enhance women's bargaining power and reduce their vulnerability to gender-based violence and abusive relationships.

➢ **Fertility and Population Growth:**
   ○ Studies have shown that as **women's labour force participation increases, fertility rates tend to decline.**
   ○ This phenomenon, known as the **"fertility transition," is associated with improved access to education**, healthcare, and family planning, leading to more sustainable population growth.

➢ **Labor Market and Talent Pool:**
   ○ Increasing women's participation in the labour force can help address skill shortages and labour market imbalances, leading to a more efficient allocation of talent and resources.

What are the Initiatives Taken to Safeguard the Employment of Women?

➢ **Labour Codes:**
   ○ **Code of Wages, 2019**
   ○ **Industrial Relations Code, 2020**
   ○ **Social Security Code, 2020**
   ○ **Occupational Safety, Health and Working Conditions Code, 2020**

➢ **Other Schemes:**
   ○ **Beti Bachao Beti Padhao Scheme**
   ○ **One Stop Centre Scheme**
   ○ **SWADHAR Greh**
   ○ **NARI SHAKTI PURASKAR**
   ○ **Mahila police Volunteers**
   ○ **Mahila Shakti Kendras (MSK)**
   ○ **NIRBHAYA Fund.**

Note:

Science & Technology

Highlights

- *High Altitude Pseudo-Satellite (HAPS)*
- *CAR-T Cell Therapy*
- *India's Ambitious Push for Deep Tech*
- *Typbar Typhoid Vaccine*
- *Green Propulsion System*

- *Nano DAP*
- *Conserving Northern White Rhino Through Surrogacy*
- *End-to-end Encryption*
- *Brainoware*

High Altitude Pseudo-Satellite (HAPS)

Why in News?

The **Council of Scientific and Industrial Research (CSIR) - National Aerospace Laboratories (NAL)** recently conducted successful tests on a **High Altitude Pseudo-Satellite (HAPS)**, marking a significant milestone in **unmanned aerial vehicle (UAV) technology**.

What is High Altitude Pseudo-Satellite (HAPS)?

➢ **About:**
- ❍ HAPS is a solar-powered UAV. It can generate **solar energy and remain in the air for months or years.**
  - ● HAPS operates in the **stratosphere** (which extends from 6-50 km above the earth's surface), flying at altitudes of **18-20 km,** nearly double the heights of commercial aeroplanes. This altitude allows them to provide **surveillance capabilities akin to satellites.**
- ❍ HAPS is designed for persistent surveillance, communications, and specialist science missions.
- ❍ HAPS is a **still-developing technology,** and the successful test flight puts India among a very small group of countries currently experimenting with this technology.

➢ **Need:**
- ❍ The need for development of HAPS arose from the desire to have continuous surveillance of border areas to detect changes or movements, particularly in the wake of the **Doklam standoff in 2017.**
- ❍ Previous **limitations with battery-powered UAVs** and satellites led to the development of solar-powered UAVs.

- ❍ The **cost** of operating HAPS is significantly **lower than traditional satellites** as it doesn't require rocket launches.

➢ **Versatility and Applications:**
- ❍ HAPS can be deployed in **disaster situations** and provide mobile **communication networks (5G waves)** in remote areas, if the normal networks get damaged due to any calamity.
- ❍ They can double up as **"towers in the sky"** and have more flexibility than satellites, in being able to map a piece of land from above.
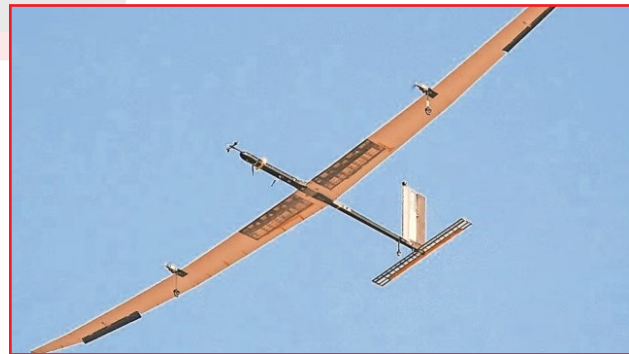
CSIR- National Aerospace Laboratories

➢ NAL, a constituent of the CSIR, established in 1959 in Bengaluru, is the only government **aerospace R&D laboratory** in the country's civilian sector.

➢ CSIR-NAL is a **high-technology-oriented institution** focusing on advanced disciplines in aerospace.

➢ CSIR-NAL has provided significant value-added inputs to all the **Indian national aerospace programmes.**

➢ CSIR-NAL's mandate is to **develop aerospace technologies** with strong science content, design and build small, medium sized civil aircraft, and support all national aerospace programmes.

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DRONE TECHNOLOGY
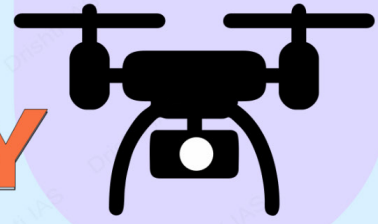
Drone is a pilotless flying machine, using aerodynamics for lift, can operate autonomously or remotely, and may carry lethal or nonlethal cargo.

COMPONENTS
- Unmanned aircraft (UA)
- Control system (ground control station - GCS)
- Control link (specialized datalink)
- Other related support equipment

CLASSIFICATION

(as per Drone Rules, 2021)
- Nano: <250 gm
- Micro: 250 gm to 2 kg
- Mini: 2 kg to 25 kg
- Small: 25 kg to 150 kg
- Large: >150 kg

APPLICATIONS
- **Mapping & Surveying** (asset Inspection, roof inspections)
- **Agriculture** (bird control, crop spraying & monitoring etc)
- Multispectral/thermal/NIR cameras, **Aerial Photo/ videography** and Live streaming events
- **Emergency Response** (search and rescue, marine rescue, fire fighting)
- **Disaster** (zone mapping, disaster relief etc)
- **Mining**
- **Monitoring Poachers**
- **Meteorology**, Aviation, Payload carrying

DRONES IN DEFENCE

Purpose
- Surveillance and Reconnaissance
- Search and Rescue
- Maritime Surveillance
- Combat Drones
- Offensive (heterogeneous SWARM drones)
- Counter-Terrorism Operations

India's Counter-Drone System
- **Indrajaal** (India's inaugural autonomous drone-defense dome)
- Procurement of combat-capable **Heron drones from Israel**
- Acquisition of **MQ-9B Armed Drones from the US**

RELATED REGULATIONS
- Aircraft (Security) Rules, 2023
- Drones Rules, 2021 and Drone (Amendment) Rules, 2022

INDIA'S INITIATIVES
- Digital Sky Platform
- No-Permission-No-Takeoff (NPNT) framework
- PLI Scheme for Drones
- Drone Shakti Scheme

ISSUES
- Increased risk of armed attacks
- Data security
- **Cheaper cost** enables a larger population to procure drones
- Use of drones in warfare **(remote warfare)**
- **Procurement by non-state actors** can pose serious threats
- Ease in **delivering mass destruction weapons**

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CAR-T Cell Therapy

Why in News?

Following **India's approval of CAR-T cell therapy,** a pioneering treatment for cancer, a patient recently underwent the procedure, achieving freedom from cancer cells, marking a significant advancement in cancer treatment accessibility in the country.

Note:

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What is CAR-T Cell Therapy?

➢ **About:** CAR-T cell therapy, also known as **chimeric antigen receptor** <u>**T-cell**</u> **therapy**, is a type of immunotherapy that uses a patient's own immune system to fight cancer.

    ○ CAR T-cell therapy has been approved for **leukaemias** (cancers arising from the cells that produce white blood cells) and **lymphomas** (arising from the lymphatic system).

    ○ CAR-T cell therapies, often referred to as **'living drugs'**.

➢ **Procedure:** It is a complex and personalised treatment process that involves:

    ○ **Collecting T cells**: T cells, a type of <u>**white blood cell**</u> that helps fight infection, are extracted from the patient's blood through a process known as **Apheresis**.

    ○ **Genetic Engineering**: In the laboratory, the T cells are genetically modified to express a special protein called a **chimeric antigen receptor (CAR)** on their surface.

       ● This CAR is designed to recognize and bind to a specific **antigen (marker)** found on cancer cells.

    ○ **Expansion**: The engineered T cells are multiplied in large numbers in the lab.

    ○ **Infusion**: The expanded **CAR-T cells** are then infused back into the patient's bloodstream, where they can identify and attack cancer cells that express the targeted antigen.
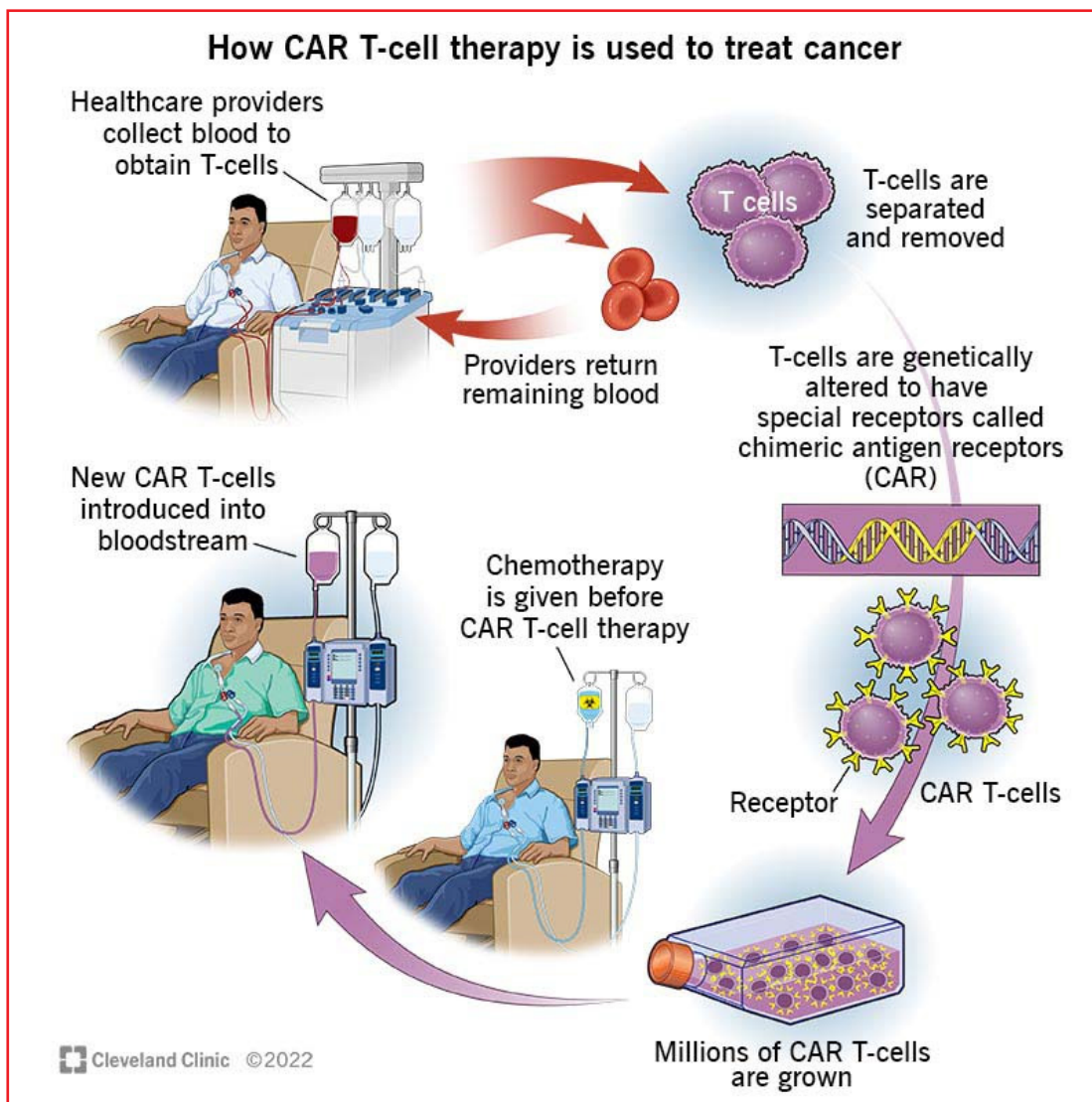
Note:

➢ **Development in India: NexCAR19**, an indigenously developed therapy for **B-cell cancers**, has been collaboratively developed by ImmunoACT, Indian Institute of Technology Bombay (IIT-B), and Tata Memorial Hospital.

  ❍ The commercial use of this therapy to treat certain blood cancers was approved by the **Central Drugs Standard Control Organisation (CDSCO)** in October 2023.

  ❍ NexCAR19 is the **first CAR-T cell therapy to get CDSCO approval.**

TREATMENT FOR SPECIFIC B-CELL CANCERS

NexCAR19 is a prescription drug for B-cell lymphomas, lymphoblastic leukaemias when other treatments have been unsuccessful

PATIENT'S WHITE blood cells are extracted by a machine through a process called leukapheresis and genetically modified, equipping them with the tools to identify and destroy the cancer cells.

NEXCAR19 IS manufactured to an optimal dose for the patient, and typically administered as a single intravenous infusion. Prior to this, the patient is put through chemotherapy to prime the body for the therapy.

HOW NEXCAR19 WORKS

T-cells are naturally made by the body as an advanced defence against viruses and cancer cells. As T-cells mature, they develop specific connectors (receptors) to target key signals on cancer cells.

Scientists have identified certain proteins that are abnormally expressed on the surfaces of specific types of cancer cells. Specially designed receptors can find and bind to these cells.

However, cancers can limit the inbuilt extent and efficiency with which T-cells are able to seek and fight them. This results in an increase in cancer burden.

A safe shell of a virus is used to genetically engineer T-cells so they express Chimeric Antigen Receptors — connectors that target a protein called CD19 on B-cell cancer.

Source: ImmunoACT

➢ **Potential Benefits of CAR-T therapy**

  ❍ **High Remission Rates:** For some patients with advanced cancers who have not responded to other treatments, CAR-T therapy can lead to **high rates of complete remission.**

  ❍ **Personalised Approach:** The therapy is tailored to each individual patient's cancer, making it a highly targeted treatment.

➢ **Potential Risks:**

  ❍ **Severe Side Effects:** CAR-T therapy can cause serious side effects, including **cytokine release syndrome** (a widespread activation of the immune system and collateral damage to the body's normal cells) and neurological symptoms (severe confusion, seizures, and speech impairment).

  ❍ **High Cost:** CAR-T therapy is a very expensive treatment.

What are the Indian Government's Initiatives Related to Cancer?

➢ **National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke**

➢ **National Cancer Grid**

➢ Encouraging **Cervical Cancer** Vaccination for girls (9-14 years) (Interim Budget 2024-25)

India's Ambitious Push for Deep Tech

Why in News?

During her **Interim Budget** address, the Finance Minister unveiled a **Rs 1 lakh crore fund** aimed at offering **long-term**, low-cost, or zero-interest loans for **research and development** initiatives.

➢ She also pledged to introduce a new program to enhance **deep-tech capabilities** in **defense**, hinting at a **broader policy** to support deep-tech startups across various sectors, expected later this year.

What is Deep Tech?

➢ **About:**

  ❍ **Deep tech** or deep technology refers to a class of startup businesses that develop **new offerings** based on tangible engineering innovation or scientific discoveries and advances.

  ❍ Deep tech fields like **Artificial Intelligence,** advanced materials, **blockchain**, biotechnology, **robotics, drones**, photonics, and **quantum computing** are moving more and more quickly from early research to market applications.

➢ **Characteristics of Deep Tech:**

  ❍ **Impact:** The deep tech innovations are **very radical** and disrupt an existing market or develop a new one. Innovations based on deep tech often change lives, economies, and societies.

  ❍ **Time & Scale:** The time required for deep technology to develop the technology and reach market-ready maturity is way more than shallow technology development (like mobile apps and websites).

  ❍ **Capital:** Deep tech often requires a lot of early-stage funding for research and development, prototyping, validating hypothesis, and technology development.

Note:

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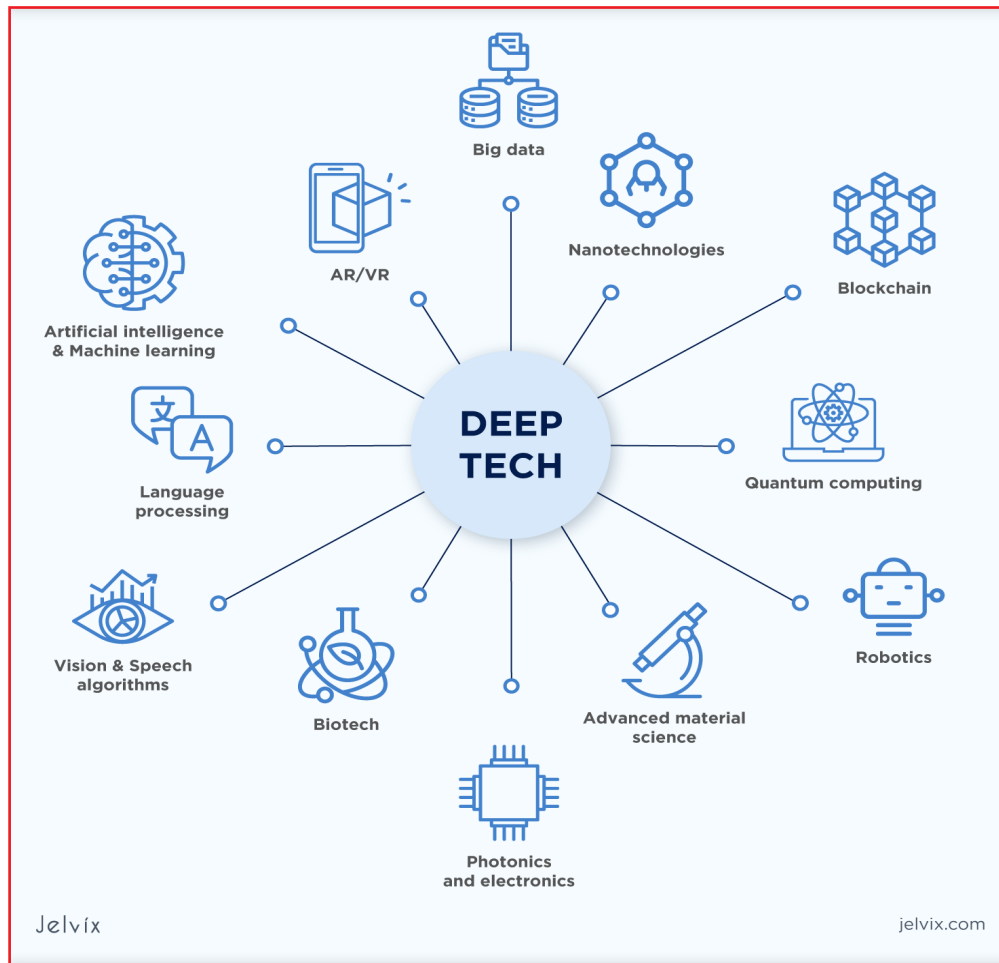
Why Deep Tech Matters?

➢ **Addressing Global Challenges:** Deep tech is poised to play a crucial role in **addressing** complex **global issues** including climate change, hunger, epidemics, energy access, mobility, and cyber security. These innovations offer promising solutions to pressing societal and environmental challenges.

➢ **Scientific Advancement:** Deep tech encompasses **cutting-edge scientific research** and technological development in fields such as artificial intelligence, biotechnology, quantum computing, and more. Advancements in these areas push the boundaries of human knowledge and understanding, leading to breakthroughs that benefit society as a whole.

➢ **Economic Growth and Competitiveness:** Investing in deep tech drives economic growth by fostering innovation, **creating high-value jobs**, and stimulating entrepreneurship. Countries and companies that lead in deep tech innovation gain a competitive edge in the **global marketplace**, attracting investment, talent, and opportunities for collaboration.

➢ **Disaster Management:** Deep tech solutions contribute to **disaster preparedness** and response efforts. For example, AI-powered predictive models can forecast natural disasters like hurricanes and earthquakes with greater accuracy, enabling authorities to evacuate populations at risk and allocate resources more efficiently.

➢ **Counterterrorism:** Deep tech enables the development of **advanced surveillance systems**, biometric identification techniques, and **predictive analytics tools**, which are instrumental in combating terrorism.

   ❍ These technologies help **identify and track** individuals involved in extremist activities, disrupt terrorist networks, and prevent future attacks.

Note:

DEEP TECH'S POTENTIAL

3,000

India currently has more than 3,000 deep tech startups, which have raised an estimated $24 billion in funding…

33%

of these have started filing for patents.

Projects built around artificial intelligence (AI) and the internet of things (IoT) account for two-thirds of India's deep tech startups. These, in turn, are focused on areas such as fintech, health care, education and logistics.

There is also research underway on how blockchain can help make banking and fintech services more secure. And a few space tech startups are working on ambitious goals in collaboration with organisations such as the government-run Indian Space Research Organisation or ISRO.

$450-500bn

By 2030, AI and data-powered companies from the deep tech ecosystem are expected to add between $450 billion and $500 billion to India's economy.

(Source: Annual and periodic reports from Nasscom, the National Association of Software and Service Companies)

What is the State of India's Deep Tech Startups?

➢ **Strengths and Opportunities**

○ India boasts a significant pool of **high-quality science** and engineering talent along with a burgeoning technology culture. This positions the country as a **frontrunner** in the development and adoption of deep-tech solutions.

○ India had over **3,000 deep-tech start-ups,** dabbling in new-age technologies like Artificial Intelligence, Machine Learning (ML), the Internet of Things, Big Data, quantum computing, robotics, etc., at the end of 2021.

○ According to **NASSCOM,** deep-tech start-ups in India raised USD 2.7 billion in venture funding in 2021, and now account for over 12% of the country's overall startup ecosystem.

○ In the last decade India's deep tech ecosystem has grown 53% and is at par with that in developed markets like the US, China, Israel, and Europe.

● **Bengaluru** accounts for 25-30% of India's deep-tech start-ups, followed by Delhi-NCR (15-20%) and Mumbai (10-12%).

➢ **Potential Contributions**

○ India has the potential to contribute significantly to the advancement of deep tech, **fostering early adoption, intellectual property sharing,** indigenous knowledge development, and self-reliance.

● This can lead to spin-off technologies, skilled workforce development, entrepreneurship, and technology exports.

○ Deep-tech start-ups are making their presence felt across sectors like drone delivery and **cold chain management** to climate action and clean energy.

Note:

3,000 PLAYERS IN INDIA

- ➤ **3,000** deep tech startups
- ➤ **12%** of overall startups are deep tech
- ➤ **53%** cumulative growth of deep tech startups in the last 10 years
- ➤ **78%** of deep tech startups have a B2B business model

- ➤ **$2.7** billion total funding raised by deep tech startups in 2021
  - ➤ **30+** M&A deals in 2021
  - ➤ **210** deep tech startups added in 2021
- ➤ **500** inventive deep tech startups*

*Inventive startups create a new product or solution backed by fundamental research and develop IP that involve scientific advances   (Source: Zinnov-Nasscom report)

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How the Government is Establishing an Ecosystem for Deep Tech Startups?

➢ The government has been actively promoting research and innovation in **transformative technology** areas, such as mobility, **battery storage,** and **quantum technology.**

  ○ Initiatives like the **National Mission on Transformative Mobility** and **Battery Storage** and the **National Quantum Mission** are examples of these efforts.

➢ **Policy Framework Development:**

  ○ In 2023, a policy framework aimed at fostering an enabling environment for companies operating in deep tech sectors was finalized. Known as the **National Deep Tech Startup Policy (NDTSP),** it is currently awaiting government approval.

    ● This policy is a collaborative effort between the **Department for Promotion of Industry and Internal Trade** and the Office of the **Principal Scientific Adviser.**

  ○ **Objectives of the Policy:** The NDTSP is designed to **address** the specific challenges encountered by technology startups and to provide them with a conducive platform to compete and collaborate globally.

  ○ **Key Focus Areas:** The NDTSP outlines several key areas that require attention to achieve its objectives:

    ● **Long-term Funding Opportunities:** Creating mechanisms for **sustained financial support** to enable deep tech startups to thrive.

- **Intellectual Property Rights Regime:** Establishing a **simplified yet robust framework** to protect intellectual property, fostering innovation and confidence among startups.

- **Tax Incentives:** Providing **tax benefits** to incentivize investment in research and development within the deep tech sector.

- **Conducive Regulatory Framework:** Developing regulations that support and facilitate the growth of deep tech startups while ensuring **compliance and safety.**

- **Standards and Certifications:** Setting industry **standards and certifications** to ensure quality and reliability in deep tech products and services.

- **Talent Nurturing:** Investing in the development of skilled professionals and fostering a talent pool conducive to deep tech innovation.

- **Industry-Academia Collaboration:** Facilitating linkages between industry, research institutions, and educational establishments to promote knowledge exchange and collaboration.

- By addressing these critical areas, the NDTSP aims to lay the **groundwork for a robust** and sustainable ecosystem that fosters innovation and growth in the deep tech startup landscape.

➢ **National Research Foundation (NRF) Implementation:** The government has established **National Research Foundation (NRF)**, which aims to **cultivate synergies** between different sectors for research advancement.

  ○ It is anticipated that around 70% of the NRF's funding, totaling Rs. 50,000 crore over five years, will originate from private industry contributions.

Note:

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What are the Challenges faced by Deep Tech Projects?

➤ **High Risk and Long-term Return on Investment:** Deep tech projects often require significant upfront investment in research and development, and may take years or decades to reach the market and generate revenue. This makes them less attractive for traditional investors, who prefer lower-risk and shorter-term ventures.

➤ **Scarcity of Specialized Talent:** Deep tech projects need highly skilled and experienced researchers, engineers, and entrepreneurs, who are in short supply and high demand. Finding and retaining such talent can be difficult and costly for deep tech startups, especially in emerging markets.

➤ **Lack of Market Readiness:** Deep tech projects may face regulatory, ethical, social, or environmental barriers that limit their adoption and scalability. They may also need to educate and convince potential customers and stakeholders about the value and feasibility of their solutions, which can be complex and unfamiliar.

➤ **Insufficient Research Funding in India:** Inadequate research funding in India persists despite a target of 2% GDP allocation. While absolute spending on R&D has risen, the proportion relative to GDP has declined, currently standing at 0.65%, well below the global average of 1.8%.

  ❍ This financial shortfall hampers India's competitiveness with scientifically advanced nations, signaling a concerning trend in diminishing support for crucial research activities.

➤ **Skepticism within the Scientific Community:** Despite the government's efforts, skepticism persists within the scientific community. Many doubt the efficacy of relying solely on the private sector for funding research. They argue that government funding remains crucial and that expectations for private investment may be overly optimistic.

➤ **Financial Inadequacy:** Despite the government's focus on innovation, budgetary increments for key departments are modest. The Council of Scientific and Industrial Research (CSIR) and the Department of Space, for example, see marginal increases, while **others face budget cuts.**

  ❍ **Bureaucratic Hurdles:** Even when funds are available, **delays and bureaucratic hurdles** often hinder their effective disbursement. Complex administrative procedures contribute to interruptions in project funding, hampering research progress.

Funding across deeptech sectors in 2023

	SEED-STAGE		EARLY-STAGE		LATE-STAGE	
	Value ($ mn)	Volume	Value ($ mn)	Volume	Value ($ mn)	Volume
Spacetech	4.5	2	114.7	6	0	0
Electric vehicles	15.5	12	214.2	11	154.4	2
Semiconductors	6.9	4	2.4	1	0	0
Cleantech	53.9	33	227.2	13	283.4	4
Other deeptech	80.7	53	421.3	25	34.3	2

Source: Tracxn (prepared on Dec 18)

Typbar Typhoid Vaccine

Why in News?

Recently, phase-3 trial conducted in **Malawi, Africa,** a region endemic for **typhoid fever,** has demonstrated the long-term efficacy of **Bharat Biotech's** Typhoid conjugate vaccine (TCV), **Typbar.** The efficacy of the vaccine was seen in children of **all age groups studied.**

➤ Typbar TCV is the **world's first clinically proven conjugate Typhoid vaccine.**

Note:

➤ A conjugate vaccine is a type of vaccine that **combines a weak antigen with a strong antigen**, also known as a **carrier protein**. This combination helps the immune system to develop a stronger and more effective immune response to the weak antigen.

➤ This stronger immune response helps to protect against infection from the pathogen that the weak antigen originated from.

What are the Major Findings of the Typbar Vaccine Trials?

Protective in children of all age groups under 12 years

The trial was carried out in in Malawi, Africa, a typhoid fever-endemic setting, in children aged nine months to 12 years

- Children were vaccinated with a single dose of the vaccine during the period February to September 2018
- 14,069 children received the typhoid vaccine while the remaining 14,061 children received the control vaccine (MenA)
- The efficacy at the end of 4.3 years of median follow-up was 70·6% in children aged nine months to two years
- The efficacy in children aged two-four years was 79·6%, while the efficacy was 79·3% in children aged five-12 years
- The absolute risk reduction was 6·1 typhoid infections per 1,000 vaccinated children
- The estimated reduction in vaccine efficacy over time was only 1·3% per year over four years

Greenlighted: Conjugated typhoid vaccine manufactured by Bharat Biotech received WHO prequalification in 2017

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What is Typhoid?

➢ **About:** Typhoid fever is a life-threatening infection caused by the *bacterium Salmonella Typhi.* It is usually spread through contaminated food or water.
  - ❍ It is transmitted by the **faecal-oral route**, through ingestion of contaminated food or water.
    - • Once the bacteria is ingested, it multiplies and spreads into the bloodstream.
  - ❍ Urbanisation and climate change have the potential to increase the global burden of typhoid.

➢ **Symptoms:** It encompasses **fever,** fatigue, **gastrointestinal problems**, headache, and occasionally a rash.
  - ❍ Severe cases can result in complications or death, confirmed through blood testing.

➢ **Risk Factor and Disease Burden:** In 2019, there were an estimated 9.24 million typhoid cases and 1,10,000 deaths across the world.
  - ❍ It remains a significant health issue, particularly in developing regions. The majority of the typhoid cases and deaths in 2019 occurred in **South-East Asia and Africa.**
  - ❍ Lack of safe water and sanitation heightens risk, **especially for children.**

➢ **Treatment: Antibiotics** are the mainstay of treatment, but **increasing resistance to antibiotic** treatment is making it easier for typhoid to spread in communities that lack access to safe drinking water or adequate sanitation.
  - ❍ The existence of **resistant strains of bacteria** means antibiotics or drugs designed to kill them no longer work, allowing them to spread rapidly, posing a risk to public health.

➢ **Prevention:** Prevention strategies include **access to safe water, sanitation, and hygiene.**
  - ❍ WHO recommends integrating **typhoid conjugate vaccines** to routine childhood immunisation programmes in typhoid endemic countries.
  - ❍ **Gavi** supports vaccine implementation in eligible nations.
    - • The **Vaccine Alliance (GAVI)** was set up as a **Global Health Partnership in 2000** with the goal of creating equal access to new and underused vaccines for children living in the world's poorest countries.

  - • At the **Global Vaccines Summit** in June 2020, India pledged **USD 15 million** for Gavi's 2021–2025 programme.

Green Propulsion System

Why in News?

A **Green Propulsion System,** developed under the **Technology Development Fund (TDF) scheme** of the **Defence Research and Development Organisation (DRDO),** has successfully demonstrated in-orbit functionality on a payload launched by the **Polar Satellite Launch Vehicle (PSLV) - C58 Mission.**

➢ This is a major achievement for the Indian space sector, as it showcases the **potential of green and indigenous technologies** for enhancing the country's defence capabilities.

Note:
➢ The TDF is a flagship programme of the Ministry of Defence which is being executed by the DRDO under the **"Make in India" initiative** for funding **innovation in defence and aerospace,** especially to startups and MSMEs.

What is the Green Propulsion System?

➢ The Green Propulsion System was developed by a Bengaluru-based start-up Bellatrix Aerospace Pvt Ltd (Development Agency).

➢ This project uses a **1N Class Green Monopropellant** for altitude control and orbit keeping of microsatellites.

➢ The system consists of **indigenously-developed propellant**, fill and drain valves, latch valve, solenoid valve, catalyst bed, drive electronics, etc.

➢ This innovative technology has resulted in a **non-toxic and environment-friendly propulsion system** for low orbit space, unlike the conventional **hydrazine-based propulsion systems** that are hazardous and polluting.
  - ❍ The system is ideal for space missions with **high thrust requirements.**

Propulsion System

➢ Propulsion means to **push forward or drive an object forward.** A propulsion system is a machine that produces thrust to push an object forward.

➢ A propellant is a substance that is expelled or expanded **to create thrust**. Propellants can be gases, liquids, or solids.

○ In rockets, propellants are **chemical mixtures that produce thrust**. They consist of fuel and an oxidizer.

➤ **The Indian Space Research Organisation (ISRO)** is developing green propellants for use in future rocket & satellite propulsion systems.

○ ISRO has made a beginning by developing an **eco-friendly solid propellant based on Glycidyl Azide Polymer (GAP)** as fuel and **Ammonium Di-Nitramide (ADN)** as oxidizer at the laboratory level, which will eliminate the emission of chlorinated exhaust products from rocket motors.

What is the PSLV-C58 Mission?

➤ ISRO's PSLV-C58 launched an **X-ray Polarimeter Satellite (XPOSAT)** into an Eastward low inclination orbit on 1st January 2024.

➤ XPoSat is the first dedicated scientific satellite from ISRO to carry out research in **space-based polarisation measurements of X-ray emission** from celestial sources.

○ This mission aims to investigate the polarization of intense X-ray sources.

○ **X-rays, with wavelengths of 0.01-10 nanometers,** are **electromagnetic radiation** characterized by perpendicular electric and magnetic fields.

● Measuring X-ray polarization, aids astronomers in studying **magnetic field orientations and strengths in celestial bodies,** crucial for understanding pulsars, **black hole regions,** and other X-ray-emitting cosmic phenomena.

Nano DAP

Why in News?

Recently, the Finance Minister in the **Interim Budget 2024-25** has announced the expansion of the application of **Nano DAP (Di-Ammonium Phosphate)** as a **Fertilizer** on various crops in all agro-climatic zones.

➤ Nano fertilisers are **highly efficient types of fertilisers** that provide nutrients like nitrogen to crops through fine granules.

What is Nano DAP?

➤ **DAP (Di-Ammonium Phosphate):**

○ DAP is the second most commonly used fertilizer in India after urea.

○ DAP is a preferred fertilizer in India because it contains both **Nitrogen and Phosphorus** which are primary macro-nutrients and **part of 18 essential plant nutrients.**

○ Fertilizer grade DAP **contains 18% Nitrogen and 46% Phosphorus**. It is manufactured by **reacting Ammonia with Phosphoric acid** under controlled conditions in fertilizer plants.

➤ **Nano DAP:**

○ **Nano DAP is a specialised form of DAP** designed with the goal of improving the fertiliser's effectiveness in promoting plant growth and development.

○ In 2023 **Indian Farmers Fertiliser Cooperative (IFFCO)** launched its Nano DAP, containing **8% Nitrogen and 16% Phosphorus by volume.**

○ Unlike conventional DAP, which comes in granular form, IFFCO's Nano **DAP is in liquid form.**

Primary Macro-nutrients Essential for Plant Growth

Nutrient	Contribution to Plant Growth
Nitrogen	Essential for **leaf and stem growth**, protein synthesis, and overall vigour
Phosphorus	Crucial for **root development, flowering, fruiting,** and energy transfer
Potassium	Aids in **overall plant health, stress resistance,** and regulation of water
Calcium	Important for **cell wall structure, cell division**, and enzyme activation
Magnesium	Essential **component of chlorophyll, involved in photosynthesis** and metabolism
Sulfur	Necessary **for protein synthesis, enzyme function**, and nutrient uptake
Carbon	Main component of **organic molecules, essential for photosynthesis**
Hydrogen	Critical for **biochemical reactions,** water uptake, and maintaining pH
Oxygen	Involved in **respiration, energy release, and nutrient transport**
Iron	Key for **chlorophyll synthesis, electron transfer**, and enzyme activation

Note:

Zinc	Essential for **enzyme function, hormone regulation**, and protein synthesis
Manganese	Required for **photosynthesis, enzyme activation**, and nitrogen metabolism
Copper	Important for **enzyme activity, lignin formation**, and nutrient uptake
Boron	Facilitates **cell division, sugar transport, and hormone regulation**
Molybdenum	Needed for **nitrogen fixation, enzyme activity,** and amino acid synthesis
Chlorine	Involved in **photosynthesis, water regulation,** and ion balance
Nickel	Required for **nitrogen metabolism, enzyme activation**, and seed development
Cobalt	Essential for **nitrogen fixation, vitamin B12 synthesis,** and enzyme activity

NANO DAP

Nano DAP is a nanotechnology based revolutionary agri input which provides nitrogen and phosphorous to plants. Nano DAP is a sustainable option for farmers towards smart agriculture and to combat climate change. Nano DAP is bio available to plants because of its desirable particle size (<100 nm), more surface area and more particles per DAP prill.

Benefits

Higher Crop Yield	Increase in Farmer's Income
Quality Food	Reduction in Chemical Fertilizer Usage
Environment Friendly	Easy to Store & Transport
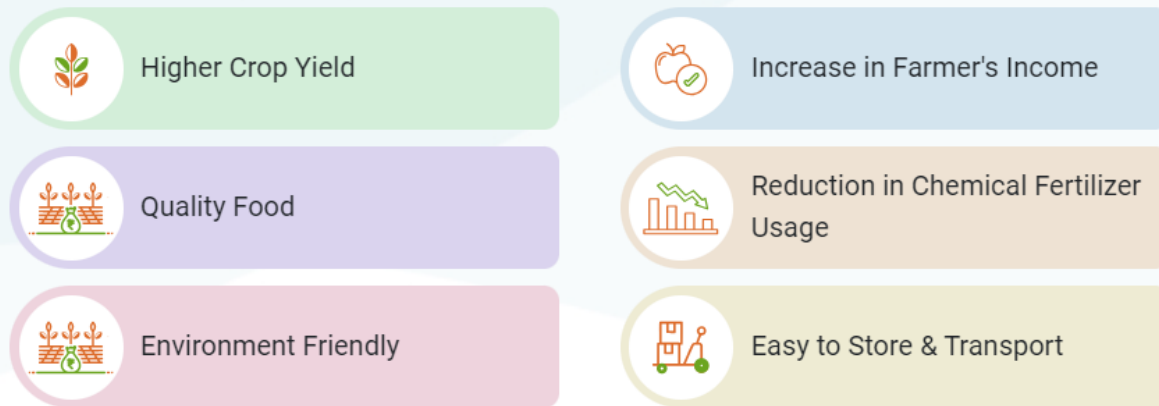
What is the Significance of Promoting Nano DAP?

➢ **More Efficient than Conventional DAP:**
  ❍ This tiny particle, **size less than 100 Nanometre (nm),** makes Nano DAP **more efficient than its conventional counterpart**, enabling the fertiliser "**to enter easily inside the seed surface** or through stomata and other plant openings".
  ❍ Better assimilation of the fertiliser inside the plant system in turn leads to "**higher seed vigour, more chlorophyll**, photosynthetic efficiency, better quality and increase in crop yields."

Note:

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➢ **Pocket-Friendly:**
  ○ It is more pocket-friendly than its conventional counterpart. A 500 ml bottle of Nano DAP, equivalent to a 50-kg bag of conventional DAP, is priced at only Rs 600 (compared to Rs 1,350 for the bag).
  ○ Since the government provides significant subsidies on DAP, the adoption of a more inexpensive fertiliser will **likely be a significant relief to the government's subsidy burden.**

➢ **More Convenient for Farmers:**
  ○ For farmers, Nano DAP is significantly more convenient as it comes in small 500 ml bottles, which are **easier to carry, store, and apply than heavy 50kg bags.**
  ○ To use Nano DAP, farmers simply mix 250-500 ml of it with water and spray it on their crops, with this amount being needed per acre per spray.

➢ **Reduction of Import Burden:**
  ○ India currently imports significant quantities of fertiliser to meet domestic demand.
  ○ The adoption of domestically-produced **Nano DAP (produced in Kalol, Gujarat)** is set to significantly reduce this import burden.
  ○ It will not only take Indian agriculture forward in foodgrain production but it will also make **India self-reliant in fertiliser production.**

➢ **Lesser Impact on Environment:**
  ○ Because of its liquid nature, nano DAP will have less impact on the environment, which leads to lower land contamination than other fertilisers.
  ○ By utilising liquid DAP and liquid urea, farmers may increase the number of earthworms in their fields and transition to natural farming without sacrificing productivity or profitability.

What is Nano Urea?

➢ **About:**
  ○ **Nano Urea** is **urea in the form of a nanoparticle**. It is a **nutrient (liquid) to provides nitrogen to plants as an alternative** to the conventional urea.
    ● Urea is a chemical nitrogen fertiliser, white in colour, which artificially provides nitrogen, a major nutrient required by plants.
  ○ It is **developed to replace conventional urea** and it can curtail the requirement of the same by at least 50%.

  ● It **contains 40,000 mg/L of nitrogen in a 500 ml bottle** which is **equivalent to** the impact of nitrogen nutrient provided by **one bag of conventional urea.**

➢ **Developed at:**
  ○ It has been indigenously developed at **Nano Biotechnology Research Centre, Kalol, Gujrat in line with Atmanirbhar Bharat** and Atmanirbhar Krishi.
    ● India is dependent on imports to meet its **urea requirements.**

➢ **Objective:**
  ○ It is aimed at **reducing the unbalanced and indiscriminate use of conventional urea,** increasing crop productivity, and reducing soil, water, and air pollution.

What are the Concerns About Using Nano DAP?

➢ **Reduced Fertiliser Input:**
  ○ While **nano urea and nano DAP offer convenience** in handling and application, their **use may lead to a reduction in the total volume of fertilizer applied** compared to conventional fertilizers.
  ○ This reduction can result in lower nutrient availability to crops**, leading to decreased productivity.**

➢ **Nutrient Imbalance:**
  ○ Nano formulations may **alter the nutrient balance in soil and plants**, potentially affecting crop growth and development. This imbalance could result in **deficiencies or toxicities of certain nutrients,** impacting overall yield and quality.

➢ **Environmental Impact:**
  ○ The long-term environmental impact of nano-fertilisers is not yet fully understood. There are **concerns about the potential accumulation of nanoparticles in soil** and water, which could **affect ecosystems and biodiversity.**

➢ **Health and Safety:**
  ○ Concerns include the **potential for these particles to enter the food chain** and impact human health. It's **crucial to assess the potential risks associated with exposure to nanoparticles during production**, application, and consumption.
  ○ Excessive **concentrations of nano-sized particles pose health risks** due to their ability to deeply penetrate the body's tissues and cells.

Note:

Note: IFFCO is one of India's biggest cooperative societies which is wholly owned by Indian **Cooperatives.**

➢ Founded in 1**967 with just 57 cooperatives,** today it is an amalgamation of over 36,000 Indian Cooperatives with diversified business interests ranging from General Insurance to Rural Telecom apart from its core business of manufacturing and selling fertilisers.

Conserving Northern White Rhino Through Surrogacy

Why in News?

The **northern white rhino (NWR)** is one of the most endangered animals on the planet, **with only two females left alive**. In a bid to rescue this species, scientists embarked on an ambitious project named **BioRescue in 2015,** employing reproductive technologies like **in-vitro fertilization (IVF) and stem cell techniques.**

➢ Recently, the international consortium, BioRescue, announced the **first-ever rhino pregnancy** through a lab-made embryo transferred to a **southern white rhino.**

➢ This endeavour represents a beacon of hope for the survival of the northern white rhino.

How are Scientists Creating Test Tube Rhinos?

➢ **In-Vitro Fertilization (IVF) Breakthrough:**
   ○ BioRescue, an international consortium of scientists, achieved a historic milestone with the **first-ever rhino pregnancy through IVF.**
      ● The process involved **transferring a lab-made rhino embryo into a surrogate southern white rhino.**

➢ **Surrogacy:**
   ○ The **death of the last male northern white rhino in 2018** made surrogacy the only viable option for species regeneration.
      ● The remaining two females, Najin and Fatu, were found incapable of reproduction for pathological reasons.
      ● The only hope for the NWR is to use frozen sperm from deceased males and eggs from the females to create embryos in the laboratory, and then implant them into **surrogate** mothers from **the southern white rhino (SWR)** subspecies, which is more abundant and genetically similar.

➢ **Concerns Regarding the Test Tube Rhinos:**
   ○ **Genetic Viability Concerns:**
      ● Embryos used in the process are **derived from eggs of two females and sperm from deceased males,** limiting the **gene pool** for a viable northern white population.
   ○ **Preserving Northern White Rhino Traits:**
      ● Crossbreeding with southern white rhinos is not a solution, as it would result in the loss of unique attributes of the northern white, adapted for swampy habitats.
         ■ Genetic diversity remains a concern even with successful IVF and surrogacy attempts.
   ○ **Behavioral Challenges in IVF Offspring:**
      ● Babies born through IVF are not genetically hardwired to exhibit **typical northern white rhino behaviours.**
         ■ Early interaction and learning from northern white adults are crucial for maintaining species-specific traits.
      ● The urgency lies in the **age of the remaining northern white females,** Najin (35) and Fatu (24).
         ■ To ensure behavioral and social skills are passed on, the first **IVF calves must be born in time to learn** from the surviving females.
   ○ Conservation Beyond Test Tubes:
      ● Critics argue that the focus should not only be on species regeneration but also on addressing the root causes of extinction, **such as habitat threats and poaching.**

Surrogacy
➢ It is an arrangement in which a **woman (the surrogate) agrees to carry and give birth to a child** on behalf of another person or couple (the intended parent/s).
○ A surrogate, sometimes also called a **gestational carrier,** is a woman who conceives, carries and gives birth to a child for another person or couple (intended parents).

What are the Key Facts Regarding the Northern White Rhino?

➢ **About:**
   ○ The **NWR is a subspecies of the white rhino (Ceratotherium simum),** which is native to **central and eastern Africa.**

Note:

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- White rhinos are the second largest land mammal after the elephant. They are known as the **square-lipped rhinoceros,** white rhinos have a square upper lip with almost no hair.
- The **northern and southern white rhino are two genetically distinct subspecies** of the white rhino.

- ➢ **Current Status:**
  - ❍ The **IUCN Red List Status** of White Rhino is Near Threatened. The IUCN status of its subspecies is as follows:
    - Northern White Rhino: **Critically Endangered.**
    - Southern White Rhino: **Near Threatened.**
  - ❍ The NWR population has declined dramatically due to **poaching, habitat loss, civil war, and disease.**
    - In the 1960s, there were about 2,000 NWRs in the wild. By 2008, only four remained.
      - The last male NWR, named Sudan, died in 2018, leaving only **two females, Najin and Fatu,** who live in a conservancy in Kenya.
  - ❍ The majority (98.8%) of the southern white rhinos occur in just four countries: South Africa, Namibia, Zimbabwe, and Kenya.
  - ❍ Southern white rhinos are around 18,000 animals that exist in protected areas and private game reserves.

> **Note: The Indian rhinoceros (also known as the greater one-horned rhinoceros)** is different from the African rhinos and it is listed as **vulnerable on the IUCN Red List.**

End-to-end Encryption

Why in News?

End-to-end encryption is crucial for **cybersecurity,** ensuring secure transmission of sensitive data by **encoding** it exclusively for the sender and recipient.

- ➢ It protects against unauthorized access, theft, surveillance, and tampering, especially in the face of rising **cyber threats.**

What is Encryption?

- ➢ **About: Encryption** involves **transforming** consumable information into an unconsumable form according to various rules, fundamentally encompassing different rule sets.
  - ❍ In this context, the **key** is a set of data that enables a computer to **decrypt** encrypted text by understanding the specific rules used to encrypt it.

- ➢ **E2E Encryption: E2E encryption** involves securing specific points through which data is transmitted.
  - ❍ When communicating with a friend on a messaging app, messages are encrypted during transit to **prevent unauthorized access,** employing both encryption-in-transit, which secures messages during relay between the server and the user, and **end-to-end encryption (E2E),** which ensures encryption both during **transit** and while stored on the server until the recipient decrypts it.
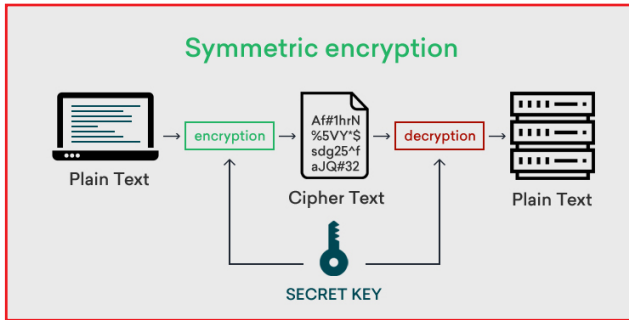
Think of it like this
➢ **Regular message:** Sending a postcard - anyone can read it.
➢ **End-to-end encryption:** Sending a sealed, coded letter - only the recipient with the right code can read it.

- ➢ **Process of Encryption:** Various encryption methods can be employed based on the desired level of secrecy and protection for information.
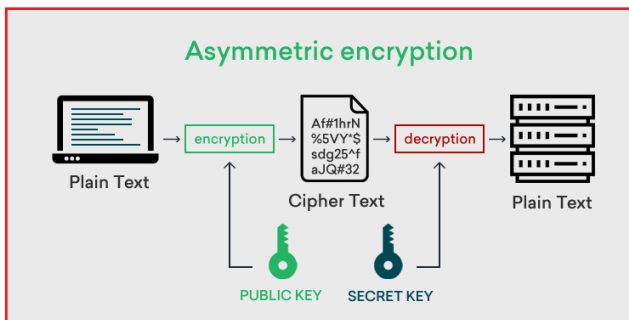
○ **Symmetric encryption** involves **using the same key** for both encrypting and decrypting information, with **Data Encryption Standard(DES)** serving as a well-known example of a **symmetric encryption protocol.**

● Symmetric encryption, exemplified by the **Advanced Encryption Standard (AES)** used in scenarios like encrypting a computer's hard drive or setting a **WiFi password,** proves beneficial when the sender and recipient are identical entities.

Symmetric encryption

Plain Text → encryption → Af#1hrN %5VY*$ sdg25^f aJQ#32 (Cipher Text) → decryption → Plain Text

SECRET KEY

○ **Asymmetric encryption,** also known as **public-key cryptography,** operates on the principle of using a **pair of keys:** a public key and a private key.

● The **public key** is openly shared and can be used by anyone to encrypt messages, but only the possessor of the corresponding **private/secret key** can decrypt those messages.

● This asymmetric encryption approach **ensures secure communication** without the need for both parties to share the same key. This way, the encryption process can be public, but decryption remains private, providing a secure means of communication.

Asymmetric encryption

Plain Text → encryption → Af#1hrN %5VY*$ sdg25^f aJQ#32 (Cipher Text) → decryption → Plain Text

PUBLIC KEY   **SECRET KEY**

➢ **Vulnerabilities of E2E Encryption:** While E2E encryption is a robust security measure, various factors, including potential vulnerabilities like **Man In the Middle (MITM) attacks,** user complacency, malware threats, company backdoors, and legal requirements, can impact the overall security of encrypted messages.

What is the Role of Hash Function?

➢ There are different symmetric and asymmetric schemes that encrypt messages in different ways, i.e. using different **hash functions.**

○ The role of a hash function is to encrypt a message while ensuring certain properties:

● **Message Concealment:** The hash function should take an input message and generate an **encrypted version** known as the **digest**. Importantly, given the digest, it should not reveal information about the original message.

● **Fixed-Length Output:** The function should accept messages of variable lengths and produce a digest with a fixed length. This **prevents deducing** the original message length from the digest length.

● **Unique Digests:** The hash function must produce **unique digests** for unique messages, ensuring that different messages do not result in the same hash.

Brainoware

Why in News?

Recently, scientists have seamlessly integrated **brain-like tissue with electronics** to create **Brainoware,** an **'organoid neural network (ONN)'** capable of recognising voices and solving complex mathematical problems.

➢ This innovative system extends **neuromorphic computing**, to a new level by directly integrating brain tissue into a computer.

What is Brainoware?

➢ **About:**

○ Brainoware is an innovative computing system that **melds brain-like tissue with electronics.**

○ Brainoware integrates **brain organoids** with microelectrodes, forming an **'organoid neural network (ONN)'** that directly incorporates living brain tissue into the computing process.

● Brain organoids are 3D tissues that simulate the **structure and function of the human brain.** They are derived from **human embryonic stem cells,** and are able to self-organize.

● Brain organoids are similar to the **brain's cell composition and structure, and can reflect the brain's developmental process**. They are used as models to study human brain development and brain-related diseases.

Note:

○ ONNs are different from **artificial neural networks**, which are made of **silicon chips** because they use **biological neurons that can adapt and learn** from their environment.

System setup
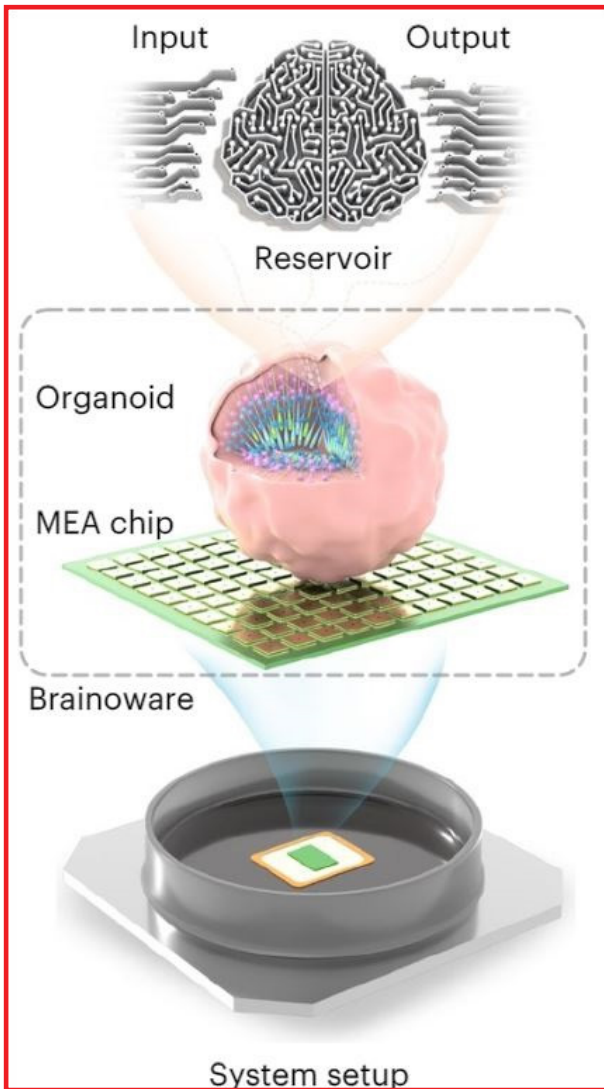
➤ **Operational Mechanism:**

○ Three-Layered Architecture: Input, Reservoir, and Output

- **Input Signals Processing:**
  - Input signals, in the form of electrical stimulation, are processed through the ONNs.
- **Reservoir:**
  - The reservoir, acting as a black-box, converts **signals into mathematical entities** that the computer can efficiently process, eliminating the need for constant back-and-forth data transfer.

- **Output Readout:**
  - The output layer, modified conventional computer hardware, interprets Brainoware's neural activity, providing a tangible result.

➤ **Advantages over Traditional Neuromorphic Computing:**

○ **Memory and Processing Separation:**

- Traditional neural networks face a challenge where **memory units and data processing units are separate,** leading to increased time and energy demands for complex problem-solving.
- Previous attempts to **improve efficiency involved neuromorphic chips with short-term memory.** However, these chips could only partially mimic brain functions and required further enhancements in processing capability and energy efficiency.

○ **Biological Neural Network Integration:**

- Brainoware utilizes a biological neural network, comprising live brain cells, to address the inefficiencies in traditional neuromorphic computing.
  - Unlike AI hardware, brain cells store memory and process data without physically separating the two, resulting in significantly lower energy consumption.

➤ **Challenges and Considerations:**

○ The system does face challenges, including the **technical expertise and infrastructure required** to maintain a biological neural network.

- Ethical concerns also arise, questioning the consciousness of organoids and their use in a mechanistic way.

➤ **Future Prospects:**

○ While Brainoware is in its early stages, continued study of the 'organoid neural network' could provide foundational insights into learning mechanisms, neural development, and the cognitive implications of **neurodegenerative diseases.**

- This could potentially contribute to advancements in neuroscience and medical research.
- It opens possibilities at the intersection of **tissue engineering, electrophysiology, and neural computation**.

Note:

Aspect	Traditional Neural Networks	Brainoware (Biological Neural Network)
Memory and Processing	Separate units	Unified – no physical separation
Energy Efficiency	Lower efficiency	Higher efficiency
Biocomputing Approach	Silicon chips	Biological components
Learning and Recognition	Requires extensive training	Comparable accuracy with less training
Accuracy in Tasks	Dependent on training epochs	Comparable accuracy with fewer epochs
Cell Types in Neural Network	Standard silicon cells	Brain organoids with varied cell types
Research Area	Traditional AI	Biocomputing

Key Terms

➢ **Neuromorphic Computing:**
  ❍ It is a type of **artificial intelligence (AI)**. It uses specialized **hardware and software algorithms** to simulate neurons and synapses to process data more efficiently than traditional computers.
    ● Neuromorphic computing uses **artificial neurons and synapses** to process data in a similar way the human brain does.
    ● It relies on parallel processing, allowing multiple tasks to be handled simultaneously. Its adaptable nature enables real-time learning and decision-making.
    ● The current neuromorphic computing market is majorly driven by increasing demand for **AI and brain chips** to be used in cognitive and brain robots.

➢ **Tissue Engineering:**
  ❍ It is a biomedical engineering field that uses engineering and life sciences to create **biological substitutes** that can restore, maintain, or improve tissue function.
    ● The goal of tissue engineering is to assemble functional constructs that restore, maintain, or improve damaged tissues or whole organs.

➢ **Neural Computation:**
  ❍ It is the **processing of information by networks of neurons**. It is a type of brain activity that aims to **understand how neurons work together** to process information.

➢ **Electrophysiology:**
  ❍ It is a branch of physiology that **studies the electrical properties of biological cells and tissues.** It also explores the electrical activity of living neurons and the molecular and cellular processes that govern their signaling.

■■■

Note:

Environment and Ecology

Highlights

- UN World Restoration Flagships
- Climate Change and Wheat Blast
- Cameroon Adopts Nagoya Protocol
- World's First Melanistic Tiger Safari in Odisha
- Humboldt's Enigma
- Ramsar Sites in India
- Gentoo Penguins
- National Conference on Promotion of Seaweed Cultivation
- 2500-year-old Solution to Fight Climate Change
- Snow Leopard Population Assessment in India
- Radioactive Discharges from Indian Nuclear Plants
- Acid Rain

UN World Restoration Flagships

Why in News?

The **United Nations** has recognized **seven initiatives** from regions spanning Africa, and Latin America, the Mediterranean, and Southeast Asia as **World Restoration Flagships.**

➤ These initiatives, aimed at **reviving ecosystems on the brink of degradation**, hold promise for environmental conservation and socio-economic development.

➤ The combined efforts of these initiatives are projected to restore approximately **40 million hectares of land** and generate around **500,000 employment opportunities.**

What are the 7 World Restoration Flagships recently Recognized by the UN?

➤ **The Restoring Mediterranean Forests Initiative:**
  ○ Involves the countries of Lebanon, Morocco, Tunisia, and Türkiye.
  ○ It consists of a novel approach said to have protected and restored natural habitats and vulnerable ecosystems.
  ○ Around **2 million hectares of forests have been restored since 2017**; aims for over 8 million by 2030.

➤ **The Living Indus initiative:**
  ○ Approved by Pakistan parliament post-2022 **climate change-induced floods.** Its official launch took place at the **27th Conference of Parties to the UN Framework Convention on Climate Change** in **Sharm el-Sheikh.**

  ○ Aims to restore 25 million hectares of the **Indus river basin by 2030.**
  ○ It designates the **Indus River as a living entity with rights**, a measure taken to protect rivers elsewhere as well.
  ○ It involves Australia, Bangladesh, Bolivia, Brazil, Canada, Ecuador, **India,** New Zealand, Peru and Sri Lanka.

➤ **The Acción Andina Social Movement:**
  ○ It is led by the non-profit Andean Ecosystems Association (ECOAN) and aims to protect and **restore one million hectares of Andean forests.**
    ● Andean forests are a type of **tropical and subtropical forest** that grow along the slopes of the Andes mountains in **South America.**
  ○ The initiative also works to **secure land titles for local communities** and protect the forest from mining and timber exploitation.

➤ **Sri Lanka Mangrove Regeneration Initiative:**
  ○ It is a science-driven programme co-led by **local communities.** It focuses on the **restoration of natural balance in the ecosystem**.
  ○ Since its launch in **2015, efforts have led to 500 hectares of restored** mangroves, according to the UN statement.
  ○ Targets restoration of **10,000 hectares of mangroves by 2030**.

➤ **Terai Arc Landscape(TAL) Initiative:**
  ○ Aimed to restore the forests of critical corridors of the **TAL in collaboration with local communities** working as citizen scientists, community-based anti-poaching units, and forest guards, among others.

Note:

- TAL spans an 810 km stretch between the **river Yamuna in the west and the river Bhagmati in the east.**
- It comprises the **Shivalik hills**, the adjoining **bhabhar areas,** and the **Terai floodplains,** covering parts of the **Indian states of Uttarakhand, Uttar Pradesh, Bihar, and the low-lying hills of Nepal.**

○ Initiative covers measures like the **restoration of 66,800 hectares of Nepal's forests**, which is said to improve the livelihoods of about 500,000 households in the country.

- It also supported the **tiger population in the landscape** shared by India and Nepal, which increased to 1,174.

○ Aims to restore 350,000 hectares of forests by 2030.

➢ **Regreening Africa's Agriculture:**

○ It increases **carbon storage**, boosts crop and grass yields, makes soil more resilient (by preventing floods) and treats it with fixed nitrogen that acts as a natural fertiliser.

➢ **Growing Forests in Africa's Drylands Initiative:**

○ Expands **restoration from 41,000 to 229,000 hectares by 2030.**

○ Involves African farmers, planting tens of millions of trees annually.

○ Creates over 230,000 jobs, supporting sustainable development.

What are UN World Restoration Flagships?

➢ **About:**

○ The World Restoration Flagships are part of the **UN Decade on Ecosystem Restoration** led by the **UN Environment Programme (UNEP)** and the **Food and Agriculture Organization of the UN (FAO)** which aims to prevent, halt, and reverse the degradation of ecosystems on every continent and in every ocean.

- The **UN General Assembly** has declared **2021–2030 as the UN Decade on Ecosystem Restoration.**

○ The UN recognizes the World Restoration Flagships through the **World Restoration Flagship Award.**

○ This award is part of the **UN Decade on Ecosystem Restoration,** spearheaded by UNEP and FAO, which aims to counteract ecosystem degradation across all continents and oceans.

○ Recipients of this award become eligible for **technical and financial assistance from the UNO.**

○ The awards track notable initiatives following **global commitments to restore one billion hectares (**an area larger than China).

➢ **Significance:**

○ Global recognition and celebration of their restoration success stories.

○ Technical and financial support of up to USD 500,000 per selected initiative (only for developing countries).

○ Attraction of global attention and investments.

○ Feature in the UN Decade's publications, campaigns, outreach, advocacy, and education efforts.

○ Listing in the UN Secretary-General's Report to the General Assembly.

What is Ecological Restoration?

➢ **About:**

○ It is the process of **aiding the recovery of ecosystems** that have been degraded, damaged, or destroyed.

➢ **Causes of Degradation:**

○ Human activities like selective logging, road building, poaching, overfishing, invasive species, land clearing, urbanization, **coastal erosion, and mining can lead to damage, degradation, or destruction of ecosystems.**

➢ **Aims and Objectives:**

○ Ecological restoration aims to **initiate or accelerate ecosystem recovery** by **creating conditions for plants, animals, and microorganisms** to carry out the recovery process themselves.

➢ **Methods and Actions:**

○ Restoration may involve actions like removing invasive species, reintroducing lost species or functions, altering landforms, planting vegetation, changing hydrology, and reintroducing wildlife.

○ Restoration is not a one-time activity; it continues as the ecosystem recovers and matures. Unforeseen barriers may arise during the recovery process.

➢ **Restoration and Conservation:**

○ **Restoration is not a substitute for conservation.** While it can restore biodiversity, structure, and function to ecosystems, **it should not be used to justify destruction or unsustainable use.**

Note:

➢ **India's Restoration Initiatives:**
  ○ Sundarbans Mangrove Restoration.
  ○ National Plan for Conservation of Aquatic Ecosystems (NPCA).
  ○ National Mission for a Green India (GIM).
  ○ Western Ghats Forest Landscape Restoration.
  ○ Green Wall.
  ○ National Afforestation Programme (NAP).
  ○ National Biodiversity Action Plan.

Climate Change and Wheat Blast

Why in News?

Recently, a new study has been published titled- *Production vulnerability to wheat blast disease under climate change,* which has warned of links between warming Climate and the fungal plant disease **Wheat Blast (WB).**

➢ The study traces the history of WB outbreaks, emphasizing its expansion beyond its original location in **South America to Bangladesh in 2016** and Zambia in 2018. The disease is linked to weather conditions influenced by phenomena like **El Niño**.

What is a Wheat Blast Disease (WB)?
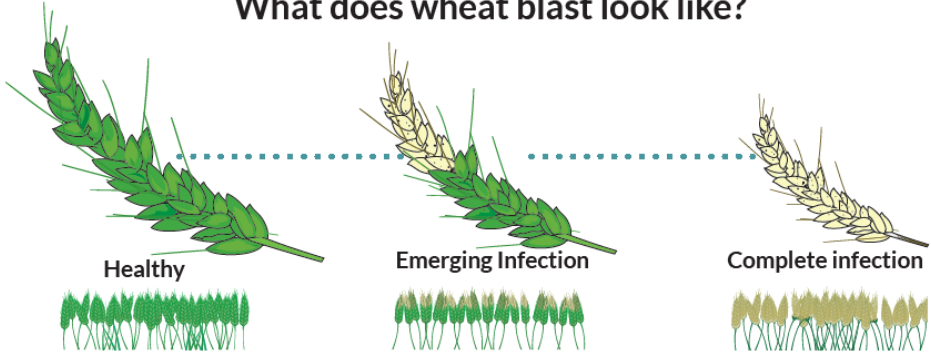
➢ **About:**
  ○ Wheat blast disease is a **highly destructive fungal infection** that primarily affects wheat crops.
  ○ It poses a significant threat to **food security and safety, p**articularly in tropical regions of South America and South Asia.
  ○ The disease is caused by the fungus *Magnaporthe oryzae pathotype triticum (MoT).*

What is wheat blast disease? How can I manage it?

(Magnaporthe oryzae pathotype *triticum)* is a devastating fungal disease that can significantly reduce wheat productivity in South Asia

What does wheat blast look like?

Healthy   Emerging Infection   Complete infection

Note:

➢ **Symptoms:**

  ❍ **Leaf Lesions:** Small, oval to spindle-shaped lesions appear on the leaves. These lesions may initially be yellow or tan and eventually turn brown or necrotic. They often have a **yellow halo surrounding them.**

  ❍ **Stem Lesions:** Similar lesions can also develop on the stems of the wheat plants. These lesions can girdle the **stem, leading to wilting and lodging of the plant.**

  ❍ **Spikelet Symptoms:** Infected spikelets may become blackened and elongated, giving them a **spindle-like appearance.** This symptom is particularly prominent during the **reproductive stage of the plant.**

➢ **Impact on Wheat Crops:**

  ❍ The fungus directly targets the wheat ear, causing it to shrivel and deform within a remarkably short period, often less than a week from the first symptoms.

  ❍ This rapid onset leaves farmers with little time to respond, leading to substantial yield losses.

  ❍ Wheat blast spreads through various means, including infected seeds, crop residues, and airborne spores capable of traveling long distances.

  ❍ The pathogen can infect all aerial parts of the wheat plant, but the most significant damage occurs when it affects the wheat ear.

What are the Key Highlights of the Study?

➢ **Climate Change Impact on Wheat Blast:**

  ❍ Wheat Blast currently poses a threat to 6.4 million hectares and by 2050, **Climate Change** is likely to make the situation worse and threaten 13.5 million hectares of cropland.

  ❍ Wheat blast is also linked with weather conditions like El Nino.

    ● A **study published in 2018 by the** Annual Review of Phytopathology too revealed that all the severe epidemics of wheat blast occurring across South America and Asia during the wet and warm years of 1987, 1997, 2002, 2009, 2012 and 2015 coincided with weather conditions **dominated by the El Nino phenomenon.**

  ❍ Wheat blast alone has the potential to reduce worldwide **wheat production by 13%**, highlighting the severity of its impact on Global **Food Security**.

➢ **Vulnerability by Region:**

  ❍ South America and Africa are identified as the **most vulnerable regions to wheat blas**t in the future climate.

  ❍ By 2050, up to 75% of wheat acreage in these region**s could be at risk.**

Yield loss (%)
- 0
- 0.1–10
- 10.1–20
- 20.1–30
- 30.1–40
- 40.1–50
- 50.1+
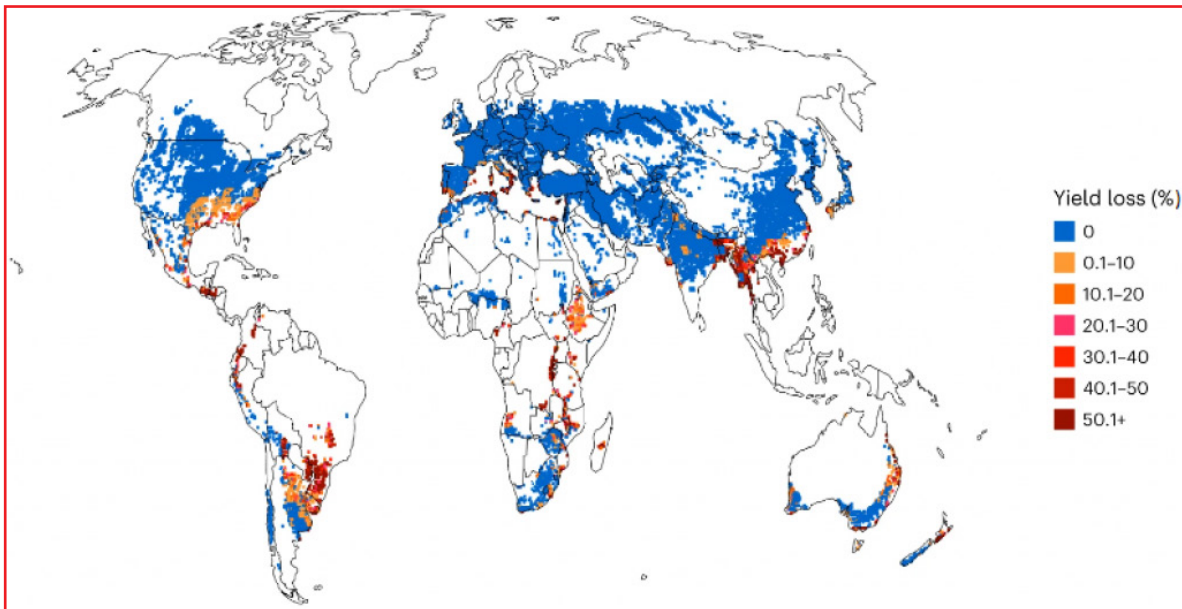
➢ **Future Spread and Impact:**

  ❍ There is potential expansion of wheat blast into new territories, including countries like **Uruguay, Ethiopia, Kenya, and Congo**.

Note:

○ It also highlights projections for increased vulnerability in regions like **Oceania and North America.**

○ Previously unaffected countries like Japan, Italy, Spain, and New Zealand are identified as **potential targets for wheat blast**, highlighting the global nature of the threat.

➢ **Impact on European Region:**

○ The cold climate in Europe and other countries where snow falls reduces the probability of infection. But climate change will **potentially alter the distribution of different insect pests** and diseases over time.

○ It is possible for European places near the Mediterranean to experience a **favourable climate for fungal infection.**

● This includes Italy and parts of southern France and Spain.

➢ **Impact on India:**

○ In India, some parts of the country may become less vulnerable to wheat blast if dry seasonal conditions with more frequent severe high temperatures (over 35 degrees Celsius) occur in the later half of the wheat-growing season in future climates.

○ Although the risk of wheat blast infection is decreased by such high temperatures, they also create t**erminal heat stress, which lowers India's potential output.**

What are the Adaptation Strategies Suggested in the Study?

➢ **Shift to Less Susceptible Crops:**

○ Given the threat to important wheat-growing areas around the world from wheat blast, farmers may **need to shift to less susceptible crops to mitigate production and financial losses**.

➢ **Multiple Strategies:**

○ It is suggested to adopt multiple strategies to manage the disease, for instance, maize cultivation is gradually replacing wheat in midwest Brazil.

○ Breeding blast-resistant wheat is also a very important strategy that could mitigate future losses in new vulnerable areas and has already been initiated.

➢ **Appropriate Sowing Date:**

○ Wheat blast-promoting conditions can also be avoided by choosing the appropriate sowing date. The adjustment in planting dates is another effective mitigation strategy against the disease.

➢ **Avoid Early Planting:**

○ Rain, followed by hot, humid weather during the flowering stage, can promote disease development. It **is recommended to avoid early planting in central Brazil and late planting in Bangladesh**, as these periods coincide with high temperatures and relative humidity due to increased precipitation levels.
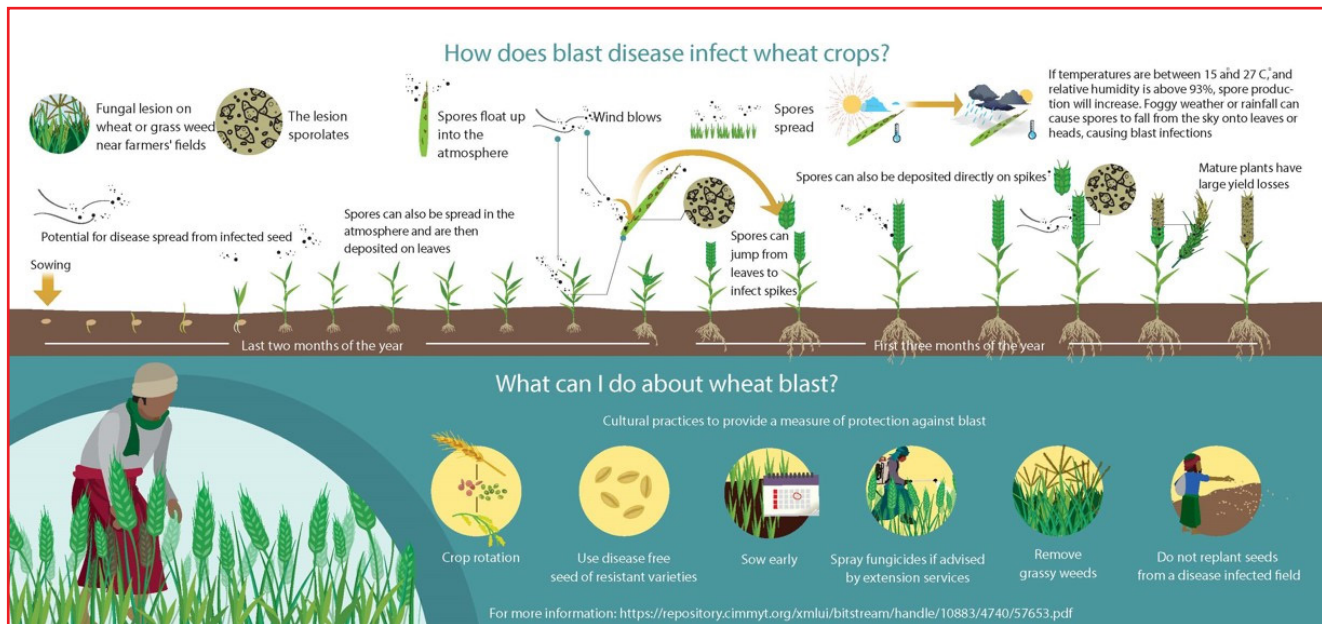
Note:

What are the Measures to Combat Wheat Blast?

➢ The wheat blast-resistant varieties produced by **CIMMYT (International Maize and Wheat Improvement Centre)** in collaboration with National Agricultural Research Systems partners have proven useful in reducing the impact of wheat blast.

➢ Developing and promoting wheat varieties resistant to wheat blast is a critical aspect of mitigating the impact of this devastating disease. Examples of wheat varieties that exhibit resistance to wheat blast, including **Rmg8 and 2NS**

❍ Rmg8 is a wheat variety developed by researchers at the CIMMYT, which possesses genetic resistance t**o wheat blast conferred by a specific gene known as Rmg8.**

❍ The 2NS involves transferring a segment of chromosome 2N from a wild relative of wheat, Thinopyrum ponticum, to cultivated wheat varieties. This translocation has been found to enhance r**esistance to various fungal diseases**.

Cameroon Adopts Nagoya Protocol

Why in News?

Cameroon, located in central Africa and boasting a rich biodiversity with around 11,000 species of plants, animals, and microorganisms, has recently adopted the **Nagoya Protocol on Access and Benefit Sharing,** an agreement under **the United Nations Convention on Biological Diversity (UNCBD).**

➢ The **Nagoya Protocol** aims to **promote the fair and equitable sharing of benefits arising from the utilization of genetic resources.**

What was the Need for Cameroon to Adopt Nagoya Protocol?

➢ **Preserving Traditional Knowledge:**

○ Many of plants, animals and microorganisms contain useful genetic information or **genetic resources, such as genes for producing medicines or crops.** The knowledge, **innovations and practices of indigenous and local communities** related to these resources are called **traditional knowledge.**

➢ **Preventing Biopiracy and Equal Sharing of Resources:**

○ Both genetic resources and traditional knowledge are valuable for bioprospecting, **which is the exploration of biological material for new sources of drugs, food or other products.** Bioprospecting can also help to conserve and sustainably use biodiversity. For Example:

● **Prunus Africana,** a plant endemic to Cameroon, is used to **make drugs for prostate cancer** but foreign companies buy a kilogramme of it USD 2.11 and sell the drugs made from it for USD 405.

● **Cameroon's Bush Mango** is a wealth of medical properties. The leaves, roots and bark are used to treat scabs and skin pain. The fruit has attracted the interest of European pharmaceutical and cosmetic companies.

➢ **Benefiting Local Communities:**

○ **None of the companies' profits benefited the communities** where the plants were harvested.

○ Adopting the **Nagoya Protocol aids in safeguarding the rights and interests of indigenous and local communities** while fostering innovation and development based on biodiversity.

What is the Nagoya Protocol Under UNCBD?

➢ **Convention on Biological Diversity (CBD):**

○ The CBD, a **legally binding treaty** to conserve biodiversity has been in force since 1993 which has **3 main objectives:**

● The **conservation of biological diversity.**

● The **sustainable use** of the components of biological diversity.

● The **fair and equitable sharing of the benefits** arising out of the utilization of genetic resources.

○ Nearly all countries have ratified it **(notably, the US has signed but not ratified).**

● India enacted **Biological Diversity Act, 2002** for giving effect to the **provisions of the CBD.**

○ The **CBD Secretariat is based in Montreal, Canada** and it operates under the **United Nations Environment Programme.**

○ The Parties (Countries) under Convention of Biodiversity (CBD), meet at regular intervals and these meetings are called **Conference of Parties (COP).**

○ In 2000, a **supplementary agreement to the Convention** known as the **Cartagena Protocol on Biosafety** was adopted. .

● The Protocol seeks to **protect biological diversity from the potential risks posed by living modified organisms** resulting from modern biotechnology.

➢ **Nagoya Protocol:**

○ The **Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS)** was adopted in **2010 in Nagoya, Japan at COP10**.

○ It **not only applies to genetic resources** that are covered by the CBD, and to the **benefits arising from their utilization** but **also covers traditional knowledge (TK) associated with genetic resources** that are covered by the CBD and the benefits arising from its utilization.

○ Along with the Nagoya Protocol on Genetic Resources, **the COP-10 also adopted a ten-year framework for action by all countries to save biodiversity.**

● Officially known as "**Strategic Plan for Biodiversity 2011-2020**", it provided a set of **20 ambitious yet achievable targets** collectively known as the **Aichi Targets for biodiversity.**

● The **Kunming-Montreal Global Biodiversity Framework (GBF)** was adopted during the 15th Conference of Parties.

■ The Framework includes **four goals to be achieved by 2050** and **twenty-three targets set for 2030.**

Note:

CBD COP15

The UN Convention on Biological Diversity (CBD) 1993 - a legally binding treaty to conserve biodiversity

CBD Conference of Parties is the Governing body of the Convention

MEETINGS OF THE CONFERENCE OF THE PARTIES

EXCOP 1
- 1st extraordinary meeting of UN CBD COP
- At Cartagena, Colombia (Feb 1999) & Montreal, Canada (Jan 2000)
- Adoption of Cartagena Protocol on Biosafety

COP 1 (1994)
- Nassau, Bahamas
- Proposed 29 December as International Day for Biological Diversity

COP 6 (2002)
- The Hague, Netherlands
- Global Taxonomy Initiative, Global Strategy for Plant Conservation adopted

COP 5 (2000)
- Nairobi, Kenya
- UNGA adopted 22 May as International Day for Biological Diversity

COP 10 (2010)
- Nagoya, Japan
- Nagoya Protocol (Access to Genetic Resources and Fair & Equitable Sharing of Benefits) adopted
- Strategic Plan for Biodiversity 2011-20 and Aichi Biodiversity Targets
- GBO 3

COP 8 (2006)
- Curitiba, Brazil
- Global Biodiversity Outlook (GBO) Report 2 (GBO 1 in 2001)

COP 11 (2012)
- Hyderabad, India

COP 14
- Sharm El-Sheikh, Egypt

COP 15

PHASE-I
- Theme - Ecological Civilization: Building a Shared Future for All Life on Earth
- Held in Kunming, China (October 2021)
- Kunming Biodiversity Fund

PHASE-II
- Held in Montreal, Canada
- Adopted Post 2020 Global Biodiversity Framework - 4 goals & 23 targets to be achieved by 2030.
- 30 by 30 Target - restore 30% degraded ecosystems and protect at least 30% of the world's lands, oceans and coastal areas by 2030
- No single country met all 20 Aichi targets (expired in 2020) within its own borders

दृष्टि The Vision

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Note:

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World's First Melanistic Tiger Safari in Odisha

Why in News?

Odisha is set to unveil the **world's first melanistic tiger safari** near the **Similipal Tiger Reserve (STR).**

NORMAL   WHITE
WHITE STRIPELESS   GOLDEN (STRAWBERRY)
PSEUDO-MELANISTIC (BLACK)   WHITE PSEUDO-MELANISTIC
MONIKA ZAGROBELNA
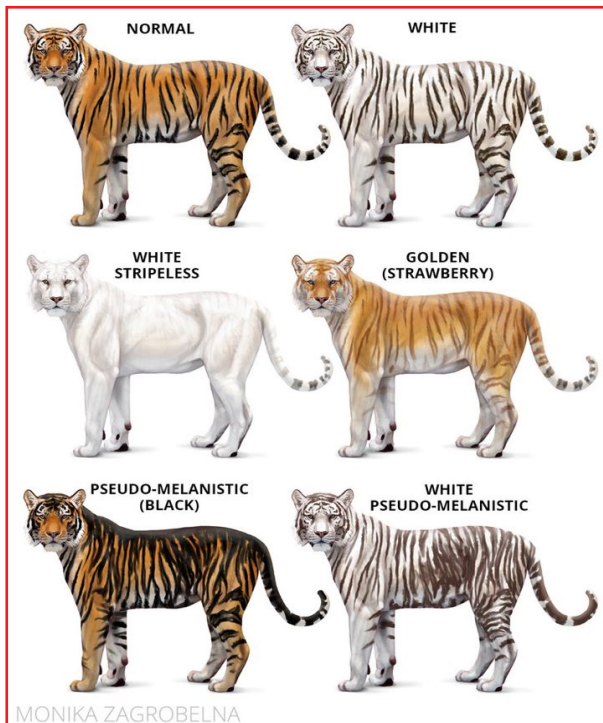
What is Odisha's Vision for the Melanistic Tiger Safari?

➢ **Melanism and Melanistic Tiger:** Melanism is a genetic condition, that results in increased melanin production, leading to **black or nearly black skin,** feathers, or hair in animals.

  ○ The **Royal Bengal Tigers of Similipal** boast a distinctive lineage with elevated melanin levels, giving rise to black and yellow interspersed stripes, making them pseudo-melanistic.

    ● According to the **All India Tiger Estimation, 2022,** Similipal Tiger Reserve houses 16 tigers, with 10 of them displaying melanistic traits.

➢ **Location of Safari**: Spanning approximately 200 hectares near **Dhanbad-Balasore National Highway-18,** the safari site lies in close proximity to STR, providing a landscape akin to Simlipal.

○ In the beginning, three melanistic tigers **from Nandankanan Zoo,** along with rescued or orphaned tigers, will **occupy the open enclosures of the safari.**

➢ **Objective**: It aims to raise awareness about the conservation needs of melanistic tigers, providing a platform for researchers and enthusiasts to engage with these rare big cats.

➢ **Approval:** The project necessitates approvals from the **Central Zoo Authority** and other regulatory bodies overseeing wildlife initiatives in the country.

  ○ A **National Tiger Conservation Authority** committee will also conduct a feasibility study of the proposed site before granting final clearance.

What are the Other Colour Variations in Tigers?

➢ **Orange with Black or Brown Stripes:** This is the most common and widely recognized tiger coloration, **e.g, the Royal Bengal Tiger.**

  ○ Each tiger's stripe pattern is unique, serving as a form of camouflage, in their natural habitat.

➢ **White Tigers:** They are not considered a separate subspecies. The colour of the white tiger's fur is the result of a genetic mutation called **leucism.**

  ○ **Leucism** is a genetic condition that results in **reduced pigmentation in animals**, causing them to have **white or pale-colored skin, feathers, fur, or scales.**

➢ **Golden Tigers:** They are also not considered a subspecies of tigers because their golden colour variation is caused by the presence of a recessive gene called **"wideband".**

  ○ The **wideband gene reduces melanin production** during the cycle of hair growth.

  ○ Recently, it was spotted in **Kaziranga National Park**.

Similipal Tiger Reserve
➢ **Location:** Similipal is situated in the **Deccan Peninsula Biogeographic Zone. Vegetation**: Predominantly **moist mixed deciduous forest** with tropical semi-evergreen patches and sporadic dry deciduous forests and grasslands.
➢ **Floral Richness**: Holds 7% of India's flowering plants and 8% of its orchid species.
➢ **Faunal Diversity**: Home to 55 mammal species, 361 bird species, 62 reptile species, 21 amphibian species, and numerous insects and microfauna.

Note:

drishti

○ Major species other than tigers include **sambar, chital, barking deer, gaur, and mouse deer, leopards**, fishing cat etc.

○ Management efforts have revived **mugger crocodile populations** along rivers Khairi and Deo.

➢ It has also been designated as a **Global Network of Biospheres** site since 2009.

TIGER

Royal Bengal Tiger (Panthera Tigris) is the National animal of India.

Subspecies of Tiger

✳ **The continental** *(Panthera tigris tigris)*

✳ **The Sunda** *(Panthera tigris sondaica)*

Habitat

Tropical rainforests, evergreen forests, temperate forests, mangrove swamps, grasslands, and savannas

Countries Where Tiger Population Is Found

▫ Found only in **13 Tiger Range countries-** India, Nepal, Bhutan, Bangladesh, Myanmar, Russia, China, Thailand, Malaysia, Indonesia, Cambodia, Laos, and Vietnam

◆ As per the latest report by IUCN, tiger has gone extinct in Cambodia, Laos, and Vietnam

Protection Status

▫ **IUCN Red List:** Endangered
▫ **CITES:** Appendix I
▫ **WPA 1972:** Schedule I

Threats

▫ Habitat loss
▫ Poaching and illegal trade
▫ Human-Wildlife conflict

Conservation Efforts

▫ **International Big Cats Alliance (IBCA):** For conservation of seven big cats namely Tiger, Lion, Leopard, Snow Leopard, Cheetah, Jaguar and Puma (launched by India)
▫ **Tx2 campaign:** Launched by WWF; stands for 'Tiger times 2' signaling the goal to double the tiger population by 2022
▫ **National Tiger Conservation authority (NTCA):** Constituted under the WPA, 1972
▫ **Project Tiger:** Launched in 1973
▫ **Tiger Census:** Every 4 years

Tigers In India

▫ India has the **largest** population
◆ As of 2022, India has 3167 tigers
◆ Largest population has been found in Central Indian Highlands & Eastern Ghats Landscape
▫ **Tiger Reserves:** India now has 53 tiger reserves
◆ **Ranipur in UP** is the latest
◆ **Nagarjun Sagar** (Andhra Pradesh) **is the largest** while Orang (Assam) **is the smallest** (Core area)

दृष्टि *The Vision* Drishti IAS

Humboldt's Enigma

Why in News?

In recent years, **Humboldt's enigma** has garnered increased attention in the field of ecology as researchers seek to understand the **unexpected biodiversity found in mountain ecosystems**, challenging traditional beliefs.

Note:

What is Biodiversity?

➢ **About**: Biodiversity underpins **all life on earth** and refers to the variety of **plant, animal, and microbial species** plus all the related genetic variations in the world.

➢ **Measurement of Biodiversity:** It is measured by two major components: **species richness and species evenness.**
  ❍ **Species Richness measures the number of species** found in a community.
    ● Tropical rainforests in the terrestrial ecosystem and coral reefs in the marine ecosystem have the highest degree of species richness.
  ❍ **Species evenness** is a measure of the **relative abundance of the different species** making up the richness of an area.
    ● **Low evenness means a few species dominate t**he site.

➢ **Biodiversity in India:** India is one of the recognized mega-diverse countries of the world, harbouring nearly **7-8% of the recorded species of the world.**
  ❍ India represents **4 out of 36 globally recognised biodiversity hotspots** (Himalaya, Indo-Burma, Western Ghats and Sri Lanka, Sundaland).
  ❍ So far, **over 91,200 species of animals and 45,500 species** of plants have been documented in the 10 **biogeographic regions** of the country.

What is Humboldt's enigma?

➢ **Humboldt's enigma:** Sparked by **Alexander von Humboldt's observations**, it questions the conventional notion that tropical regions, **fueled by ample sunlight**, are the primary centres of biodiversity on Earth.
  ❍ It contends that **despite receiving less sunlight and enduring colder temperatures, mountain ecosystems defy this notion by showcasing exceptional biodiversity**, thereby challenging traditional ecological theories and prompting investigation into this anomaly.

➢ **Humboldt's Observations:** Humboldt suggested there was a relationship between **temperature, altitude, and humidity** on one hand and the **occurrence patterns of species or their biodiversity** on the other.
  ❍ His example of choice was the **Chimborazo mountain in Ecuador,** which has today become an important illustration of mountain diversity.

➢ **Factors Contributing to Mountain Biodiversity:**
  ❍ **Varied Topography:** Mountains offer a mosaic of **microclimates**, ranging from snow-capped peaks to sheltered valleys.
    ● This diversity creates distinct ecological niches, suitable for a wider range of species.
  ❍ **Isolation:** Mountains act as **isolated "islands" in the sky,** promoting unique evolutionary pathways and endemic species, found nowhere else.
    ● For example, the **Hawaiian Islands are home to many endemic species of plants and animals**, which evolved in isolation from the mainland.
  ❍ **Dynamic landscapes:** Geological processes like **landslides and glacial retreats** constantly reshape mountain landscapes, creating opportunities for new species to colonize and evolve.

➢ **India's Enigmatic Mountains:** India's diverse mountain ranges, including the **Himalayas especially Eastern Himalayas,** serve as ideal settings to probe Humboldt's enigma.
  ❍ According to the World Wildlife Fund, the Eastern Himalayas harbours thousands of different species, including over **10,000 plants, 900 species of bird, and 300 species of mammal.** Many of which are endangered or critically endangered.
  ❍ Its grasslands are home to the densest populations of **Bengal tigers, Asian elephants, and one-horned rhino.**
  ❍ Its mountains offer refuge t**o snow leopards, red pandas, takins, Himalayan black bears, and golden langurs,** and its rivers contain the world's rarest **dolphins (Gangetic).**

➢ **Related Indian Government Initiatives:**
  ❍ **National Mission on Sustaining Himalayan Ecosystem**
  ❍ **National Mission on Biodiversity and Human Wellbeing**

Note: The world's tropical areas receive more energy from the Sun because of the **earth's angle of inclination**. Therefore, the tropics have greater primary productivity, which then facilitates greater diversity: **more ecological niches become available**, creating more complex ecosystems and greater biological diversity.

Note:

EARTH'S TERRESTRIAL HOT SPOTS OF BIODIVERSITY

Source: Conservation International Foundation   © Encyclopædia Britannica, Inc.
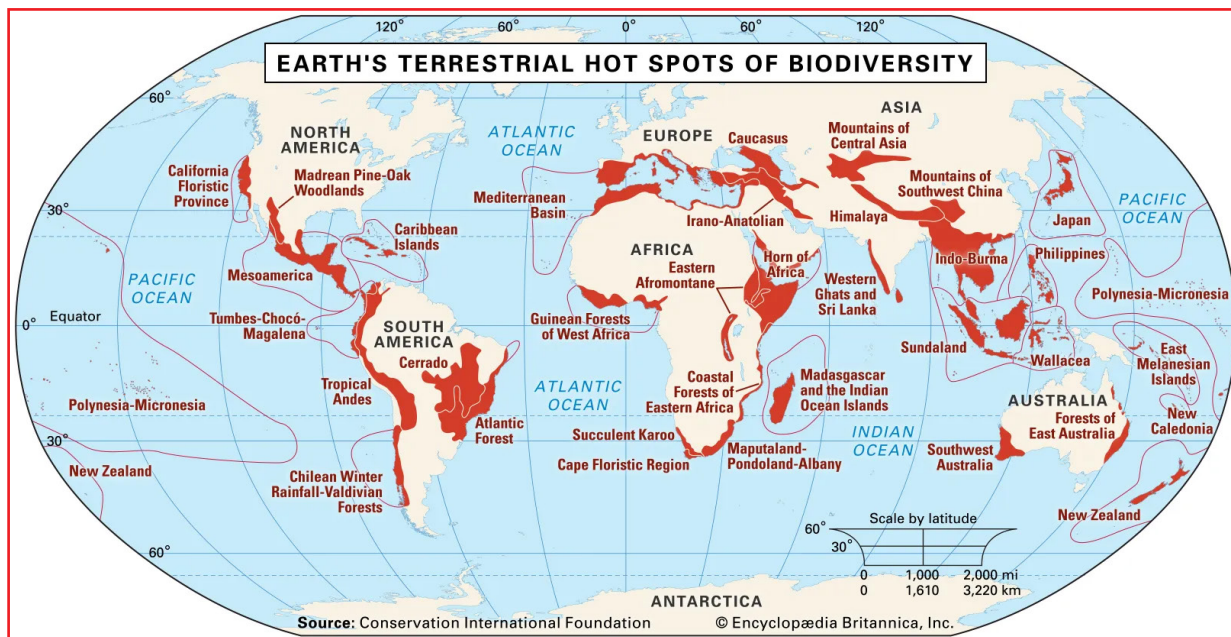
Ramsar Sites in India

Why in News?

Recently, the **Ministry of Environment, Forest and Climate Change** announced that on the eve of **World Wetlands Day,** 2024, India has increased its tally of **Ramsar sites** to **80 from the existing 75** by designating five more wetlands as **Ramsar sites**.

➢ Three of these sites, **Ankasamudra Bird Conservation Reserve, Aghanashini Estuary** and **Magadi Kere Conservation Reserve** are located in **Karnataka** whereas two, **Karaivetti Bird Sanctuary** and **Longwood Shola Reserve Forest** are in **Tamilnadu.**

➢ **Tamil Nadu** continues to have the maximum number of **Ramsar Sites** (16 sites) followed by **Uttar Pradesh** (10 sites).

What is the Ramsar Convention?

➢ It is an intergovernmental treaty, adopted on **2nd February 1971,** in the **Iranian city of Ramsar**, on the southern shore of the **Caspian Sea.**
  ○ In India, it came into force on **1st February 1982,** under which **wetlands of international importance** are declared as **Ramsar sites.**

➢ **World Wetlands Day (WWD):**
  ○ It is celebrated across the globe to commemorate the adoption of this international agreement on wetlands on **2nd February 1971.**

○ The theme of **World Wetland Day, 2024** is **'Wetlands and Human Wellbeing'** which underscores the critical role wetlands play in enhancing our lives.

○ It highlights how wetlands contribute to **flood protection, clean water, biodiversity** and **recreational opportunities,** all of which are essential for human health and prosperity.

What are the Characteristics of the Newly Designated Ramsar Sites?

➢ **Ankasamudra Bird Conservation Reserve (Karnataka):**
  ○ It is a **human-made village irrigation tank** built centuries back and is spread over an area of **244.04 acres** adjoining the **Ankasamudra village.**

➢ **Aghanashini Estuary (Karnataka):**
  ○ It is spread over an area of **4801 ha, and** is formed at the confluence of the **Aghanashini River** with the **Arabian Sea.**
  ○ The **brackish water** of the estuary provides diverse ecosystem services including **flood** and **erosion risk mitigation, biodiversity conservation** and **livelihood support.**
  ○ The wetland also provides livelihoods by supporting **fishing, agriculture, collection of edible bivalves** and **crabs, shrimp aquaculture, traditional fish farming** in the **estuarine rice fields (locally known as Gazni rice fields)** and salt production.
  ○ The **mangroves** bordering the estuary help to protect the shores against **storms** and **cyclones.**

Note:

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➢ **Magadi Kere Conservation Reserve (Karnataka):**
  ○ It is a **human-made wetland** with an area of nearly **50 hectares** which was constructed to **store rainwater** for irrigation purposes.
  ○ The wetland harbors two vulnerable species, namely **Common pochard** *(Aythya ferina)* and **River tern** *(Sterna aurantia)* and **four near-threatened species** namely **Oriental Darter** *(Anhinga melanogaster)*,

Black-headed Ibis *(Threskiornis melanocephalus),* **Woolly- necked Stork** *(Ciconia episcopus)* and **Painted Stork** *(Mycteria leucocephala).*
  ○ It is also one of the largest wintering grounds for the **Bar-headed goose** *(Anser indicus)* in Southern India. It has been declared globally as an **Important Bird and Biodiversity Area (IBA).**

RAMSAR CONVENTION

About
➢ Also known as the Convention on Wetlands.
➢ An intergovernmental treaty, adopted in 1971, in Ramsar, Iran.
  ➢ Entered into force in 1975.
➢ Wetlands that are of international importance are declared as Ramsar sites.
➢ **Largest Ramsar Site in World:** Pantanal: South America

Montreux Record
➢ Adopted in Montreux (Switzerland) in 1990.
➢ Identifies Ramsar sites that need priority conservation attention at national or international level.

Wetlands
➢ A place in which the land is covered by water – salt, fresh, or somewhere in between – either seasonally or permanently.
➢ Take many forms including rivers, marshes, bogs, mangroves, mudflats, ponds, swamps, billabongs, lagoons, lakes, and floodplains.
➢ **World Wetlands Day:** 2nd February
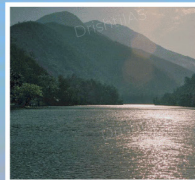
India & Ramsar Convention
➢ Came into force in India: **1982**
➢ Total Number of Ramsar Sites: **75**
  ➢ Chilika Lake (Odisha), Keoladeo National Park (Rajasthan), Harike Lake (Punjab), Loktak Lake (Manipur), Wular Lake (Jammu and Kashmir), etc.
➢ Related Framework in India
➢ The Ministry of Environment, Forest and Climate Change (MoEF&CC) has notified Wetlands (Conservation and Management) Rules, 2017 under the provisions of the Environment (Protection) Act, 1986 as regulatory framework for conservation and management of wetlands.
➢ The 2017 Rules decentralise wetlands management and provide for the constitution of the State Wetlands Authority or Union Territory Wetlands Authority.

Key Facts
➢ **Largest Ramsar Site:** Sunderbans, West Bengal
➢ **Smallest Ramsar Site:** Vembannur Wetland Complex, Tamil Nadu
➢ **State with the maximum number of Ramsar Sites:** Tamil Nadu (14)
➢ **Wetlands in Montreux Record:**
  ➢ Keoladeo National Park: Rajasthan
  ➢ Loktak Lake: Manipur

➢ **Karaivetti Bird Sanctuary (Tamil Nadu):**
  ○ Water from the wetland is utilized by the villagers for cultivating agricultural crops such as **paddy, sugar cane, cotton, corn,** and **split red gram.**
  ○ About 198 species of birds have been recorded here; some of the important visitors being the **Bar headed Goose, Pin-tailed duck, Garganey, Northern Shoveler, Common Pochard, Eurasian Wigeon, Common teal** and **Cotton teal.**
➢ **Longwood Shola Reserve Forest (Tamil Nadu):**
  ○ It derives its name from the Tamil word, **"Solai",** which means a **'tropical rainforest'.**

  ○ The 'Sholas' are found in the upper reaches of the **Nilgiris, Anamalais, Palni hills, Kalakadu, Mundanthurai** and **Kanyakumari** in **Tamil Nadu.**
  ○ These forested wetlands serve as habitats for the globally endangered **Black-chinned Nilgiri Laughing thrush** *(Strophocincla cachinnans),* **Nilgiri Blue Robin** *(Myiomela major),* and **vulnerable Nilgiri Wood-pigeon** *(Columba elphinstonii).*

What are the Other Initiative Taken for Conservation of Wetland?
➢ **Global Level:**
  ○ **Montreux Record**
  ○ **World Wetlands Day**

Note:

- ➢ **National Level:**
  - ○ <u>Wetlands (Conservation and Management) Rules, 2017.</u>
  - ○ <u>National Plan for Conservation of Aquatic Ecosystems (NPCA)</u>
  - ○ <u>Amrit Dharohar Capacity Building Scheme</u>
  - ○ **National Wetland Conservation Programme (NWCP):**
    - It was launched in 1985, to tackle **threats to vulnerable wetland ecosystems** and enhance their conservation.

Gentoo Penguins

Why in News?

Recently, over 200 **Gentoo penguins** have been found dead in the **Falkland Islands, Antarctica** due to the spread of the <u>H5N1 Avian Influenza Virus.</u>

- ➢ Falkland Islands is an archipelago in the South Atlantic Ocean.

What is Avian Influenza?

- ➢ **About:**
  - ○ Avian influenza, often referred to as **bird flu, is a highly contagious viral infection** that primarily affects birds, particularly wild birds and domestic poultry.
  - ○ In 1996, highly pathogenic avian influenza H5N1 virus was first identified in domestic waterfowl in Southern China. The virus is named A/goose/Guangdong/1/1996.
- ➢ **Transmission to Humans and Related Symptoms:**
  - ○ Human cases of H5N1 avian influenza occur occasionally, but it is difficult to transmit the infection from person to person. As per <u>World Health Organisation (WHO),</u> when people do become infected, the mortality rate is about 60%.
    - It can range **from mild flu-like symptoms,** including fever, cough, and muscle aches, **to severe respiratory issues** like pneumonia, difficulty breathing, and even cognitive problems such as altered mental status and seizures.
- ➢ **Avian Influenza and India:**
  - ○ **Initial Outbreak:**
    - The initial outbreak of Highly Pathogenic Avian Influenza (HPAI) H5N1 in India occurred in 2006

in Navapur, Nandurbar district, Maharashtra, and was followed by annual outbreaks.

- H5N8 was first observed in India in November 2016, mainly affecting wild birds across five states, with **Kerala reporting the most cases.**
- The disease has been reported in 24 states and union territories, resulting in the culling of over 9 million birds to control its spread.
- ○ **Related Initiative:**
  - India's approach to **controlling Highly Pathogenic Avian Influenza (HPAI)** follows a **"detect and cull" policy** as outlined in the **National Action Plan for Prevention, Control, and Containment of Avian Influenza (revised - 2021).**
- ➢ **Treatment:**
  - ○ Antivirals have demonstrated effectiveness in the treatment of avian influenza virus infections in humans, lowering severity and the risk of death.

Types	A Subtypes	HPAI vs LPAI
Influenza A (Infects a wide range of animals including birds)	Avian (Can infect humans) H5N1 H7N3 H7N7 H7N9 H9N2 H10N8	HPAI H5N1 LPAI H5N1 HPAI H5N8 LPAI H5N8
Influenza B (Mainly infects humans)	Swine (Can infect humans) H1N1 H1N2 H3N2	Subtypes can be classified as high path or low path based on the ability of the specific virus strain to kill chickens in the lab setting.
Influenza C (Infects humans and pigs but more rare than types A and B)		
Influenza D (Infects cattle)	Most common human H1N1 H3N2	

- ➢ **HPAI stands for Highly Pathogenic Avian Influenza** and **LPAI** stands for **Low Pathogenic Avian Influenza.**

What are the Key Facts About Gentoo Penguins?

- ➢ **Scientific Name:** *Pygoscelis papua*
- ➢ **About:**
  - ○ They are characterized by a **band of white feathers extending across t**he top of the head from just above each eye.
  - ○ Other **distinguishing features include a black throat, a brush tail** that is large in comparison with other penguin species, and a bill that is mostly deep orange or red.

➢ **Distribution:**
  ○ They are exclusively **located in the Southern Hemisphere**, primarily found on the Antarctic Peninsula and numerous sub-Antarctic islands, with a notable concentration in the **Falkland Islands in the South Atlantic Ocean.**

➢ **Habitat:**
  ○ These penguins are typically **situated along shorelines,** allowing for quick **access to food sources while staying in proximity to their nests**. This strategic positioning facilitates efficient foraging and nesting activities.

➢ **Threats:**
  ○ **Predators:** Vulnerable to predation by South American **sea lions, Weddell seals, leopard seals, killer whales**, skuas, sheathbills, caracaras, and giant fulmars.

  ○ **Human Impact:** Historical practices such as **egg collection** for supplementation, and harvesting of skins and blubber.

  ○ **Environmental Changes:** Changing environmental conditions and competition with humans for prey, potentially impact population sizes.

➢ **Conservation Status:**
  ○ **IUCN Red List:** Least Concern.

What are the Key Facts About the Falkland Islands?

➢ **Location:** The Falkland Islands are **a British Overseas Territory located in the South Atlantic Ocean**. They are about 500 km east of the coast of Argentina.
  ○ Stanley is the capital and largest city of the Falkland Islands.

➢ **Territorial Status:** The Falkland Islands are a British Overseas Territory, but **Argentina also claims sovereignty over the islands,** leading to a historical conflict between the two countries. E.g. **1982 War between Argentina and British forces** over the territory of the Falkland Islands.
  ○ English is the official language.

➢ **Wildlife:** The Falkland Islands are **home to diverse wildlife,** including various species of **birds, seals, and penguins.** The islands are known for their large colonies of penguins, such as the King Penguin and the Magellanic Penguin.

National Conference on Promotion of Seaweed Cultivation

Why in News?

Recently, the National Conference on Promotion of **Seaweed** Cultivation was held in **Koteshwar (Kori Creek), Kutch, Gujarat**.

➢ It aimed at implementing seaweed cultivation on a pan-India basis, emphasizing the promotion of seaweed cultivation to diversify marine production and enhance fish farmer income.

What are Seaweeds?

➢ **About**: Seaweeds are **macroscopic, multicellular, marine algae**. They come in a variety of coluors, including **red, green, and brown.**
  ○ They are referred to as the **'Medical Food of the 21st Century'.**

➢ **Distribution**: Seaweeds are found mostly in the **intertidal region**, in shallow and deep waters of the sea and also in estuaries and backwaters.
  ○ Large seaweeds form dense underwater forests known as **kelp forests,** which act as underwater nurseries for fish, snails and sea urchins.

Note:

- ➢ **Seaweed Species in India:** India boasts approximately 844 reported seaweed species in its seas.
  - ❍ Some specific species, such as **Gelidiella acerosa, Gracilaria spp., Sargassum spp., Turbinaria spp., and Cystoseira trinodis** are cultivated for the production of agar, alginates, and liquid seaweed fertilizer.

Note: Agar is obtained from **red algae** and is used as thickening and gelling agent in jellies, puddings, jams etc, whereas alginate is obtained from **brown algae** and used as thickener and stabilizer in **ice cream, sauces, and dressings.**

- ➢ Despite having **46 seaweed-based industries in India**, particularly 21 for Agar and 25 for Alginate production, their operational efficiency is hindered by the shortage of **raw materials.**
- ➢ **Major Seaweed Beds in India:** Abundant seaweed resources are found along the **Tamil Nadu and Gujarat coasts,** as well as around **Lakshadweep and the Andaman & Nicobar Islands.**
  - ❍ Notable seaweed beds exist around Mumbai, Ratnagiri, Goa, Karwar, Varkala, Vizhinjam, and Pulicat in Tamil Nadu, Andhra Pradesh, and Chilka in Orissa.
- ➢ **Significance:**
  - ❍ **Bio-indicator:** They act as **bio-indicator by absorbing excess nutrients** and signalling marine chemical damage caused by waste from agriculture, industries, and households, often leading to **algal blooming.**
    - ● They play a vital role in **restoring ecosystem balance.**
  - ❍ **Food Source:** Seaweed is a nutritional powerhouse, rich in **vitamins, minerals, and dietary fibre.**
    - ● It Is used in various food products, from **sushi and salads** to snacks and thickeners.
    - ● Many seaweeds **contain anti-inflammatory and anti-microbial agents.** Seaweed is the **best source of iodine.**
  - ❍ **Bioproducts:** Seaweed extracts are used in a wide range of products, including **cosmetics, pharmaceuticals, and bioplastics**. They offer sustainable alternatives to conventional options.
  - ❍ **Carbon Capture:** Seaweed **absorbs carbon dioxide from the atmosphere as it grows**, making it a potential tool in the fight against **climate change**.
    - ● Studies suggest cultivating and sinking seaweed could effectively store long-term carbon.

- ❍ **Livelihoods:** Seaweed farming provides income and empowers coastal communities, particularly **women and small-scale farmers.**
  - ● It requires minimal investment and offers relatively quick returns.
- ❍ **Other Benefits:** Seaweeds are utilized for various purposes, including laxatives, pharmaceutical capsules, **goiter treatment, cancer therapy, bone replacement,** and cardiovascular surgeries.
  - ● Anecdotal evidence also suggests that the **ancient Egyptians** may have used them as a treatment for breast cancer.
- ➢ **Related Government Initiatives:**
  - ❍ **Seaweed Mission:** This initiative aims to commercialize seaweed farming and processing for value addition. It also aims to increase cultivation along India's **7,500-kilometer coastline**.
  - ❍ **Commercialisation of Seaweed Products:** The **Indian Council of Agricultural Research(ICAR)- Central Marine Fisheries Research Institute (CMFRI)** has successfully commercialized two seaweed-based nutraceutical products, **CadalminTM Immunalgin** extract (CadalminTM IMe) and **CadalminTM Antihypercholesterolemic** extract (CadalminTM ACe).
    - ● These products, developed with **eco-friendly 'green' technology**, aim to boost anti-viral immunity and combat high cholesterol or dyslipidemia (imbalance of cholesterol).
  - ❍ **Multi-Purpose Seaweed Park** in Tamil Nadu.

2500-year-old Solution to Fight Climate Change

Why in News?

Recently, the Researchers from the **Birbal Sahni Institute of Palaeosciences** using the 2500-year timeline of human occupation at Vadnagar, showed that **India has a 2500-year-old solution to fight Climate Change.**

- ➢ The study used a comprehensive approach by **examining** various types of data, including **archaeological findings, plant remains, and isotopic data.**
- ➢ Additionally, they conducted **dating analyses using Isotopes and Radiocarbon** on grains and charcoal.

Note:

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What are the Key Highlights of the Report?

➢ **Climate Adaptation Over Millennia:**
  ○ In the semi-arid region of Gujarat, the historic site of Vadnagar has unveiled a resilient **agricultural economy that thrived** over a 2500-year period despite the fluctuation of **Monsoon** Rains over centuries.
  ○ Vadnagar experienced **varying levels of monsoon precipitation** during the Historic, **Medieval (800 CE-1300 CE),** and post-Medieval (**Little Ice Age**) periods.

➢ **Resilient Crop Economy:**
  ○ Despite fluctuations in monsoon rains, the post-Medieval period (1300-1900 CE) saw a **resilient crop economy based on small-grained cereals,** particularly millets (C4 plants).
  ○ The use of **C4 plants reflects the community's adaptive respons**e to a prolonged weakening of the summer monsoon during the Little Ice Age.
    ● **C4 plants** are a type of plants that utilize a **specific photosynthetic pathway** known as the **C4 carbon fixation pathway.** This pathway is an **adaptation to hot and arid environment**s, as well as **conditions where there is a high likelihood of photorespiration.**

➢ **Diversification of Food Crops:**
  ○ **Diversification of food crops and socio-economic practices** allowed these ancient societies to **navigate the challenges posed by** fluctuating precipitation and periods of **drought.**

What is the Significance of this Study?

➢ It highlights the **importance of understanding historical climate patterns** and human responses to them.
➢ It suggests that **past famines and societal collapses were not solely the result of climate deterioration** but were also influenced by institutional factors.
➢ Insights from the **study can inform contemporary climate change adaptation strategies,** emphasizing the importance of understanding historical climate patterns and human responses.

What are India's Climate Change Mitigation Initiatives?

➢ **National Action Plan on Climate Change (NAPCC):**
  ○ Launched in 2008 to address climate change challenges in India.
  ○ Aim to **achieve low-carbon and climate-resilient development** for India.
  ○ There are **8 national missions forming the core of the NAPCC** which represent multi-pronged, long term and integrated strategies for achieving key goals in climate change. These are-
    ● **National Solar Mission**
    ● **National Mission for Enhanced Energy Efficiency**
    ● **National Mission on Sustainable Habitat**
    ● **National Water Mission**
    ● **National Mission for Sustaining the Himalayan Ecosystem**
    ● **National Mission for A Green India**
    ● **National Mission for Sustainable Agriculture**
    ● National Mission on Strategic Knowledge for Climate Change

➢ **Nationally Determined Contributions (NDC):**
  ○ India's commitments to **reduce greenhouse gas emissions** and adapt to climate change.
  ○ Pledged to **reduce the emissions intensity of GDP by 45% by 2030 from 2005 levels** and **generate 50% of electricity from non-fossil fuel sources by 2030.**
  ○ Pledged to **create additional carbon sink** and achieve **net zero emissions by 2070.**

➢ **National Adaptation Fund on Climate Change (NAFCC):**
  ○ Established in **2015 to provide financial assistance to state governments** for implementing adaptation projects in various sectors.

➢ **State Action Plan on Climate Change (SAPCC):**
  ○ Encourages **all states and union territories to prepare their own SAPCCs based on their specific needs and priorities.**
  ○ SAPCCs outline strategies and actions for addressing climate change at the sub-national level.
  ○ Aligned with the objectives of the NAPCC and the NDC.

Birbal Sahni Institute of Palaeosciences

➢ **Establishment and Vision:** Founded in 1946 **by Professor Birbal Sahni,** with the vision to **establish palaeobotany as a distinct science**. The institute aimed to address issues related to the **origin and evolution of plant life, geological concerns,** and exploration of fossil fuels.

Note:

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➢ **Focus Areas of Research:**
  ○ Biotic evolution through geological time.
  ○ Diversification of Precambrian life.
  ○ Diversity, distribution, origin, and evolution of Gondwana and Cenozoic flora.
  ○ Phylogenetic framework for understanding plant life.
  ○ Intra and inter-basinal correlation during Gondwanan and Cenozoic time-slices.
  ○ Organic petrology to evaluate the quality of Gondwana coals and Cenozoic lignite.

Snow Leopard Population Assessment in India

Why in News?

The **National Board for Wildlife** meeting in New Delhi witnessed the release of the **report on the Status of Snow Leopards** in India by the **Union Minister of Environment, Forest, and Climate Change (MoEFCC)**.

➢ This report is a result of the **Snow Leopard Population Assessment in India (SPAI) Program**, a significant scientific exercise that provides crucial insights into the snow leopard population in India.

What is the Snow Leopard Population Assessment in India (SPAI) Program?

➢ The SPAI Program is the **first-ever comprehensive scientific exercise** aimed at assessing the population of snow leopards in India.
  ○ The **Wildlife Institute of India (WII)** served as the National Coordinator for the SPAI, with support from snow leopard range states and conservation partners, the **Nature Conservation Foundation (NCF), Mysuru** and **World Wildlife Fund(WWF)-India.**

➢ The SPAI systematically covered over **70% of the potential snow leopard habitat across the trans-**

Himalayan region, including UTs of Ladakh and Jammu and Kashmir, and states such as Himachal Pradesh, Uttarakhand, Sikkim, and Arunachal Pradesh.

➢ The assessment was conducted from 2019 to 2023 using a meticulous two-step framework, including e**valuating snow leopard spatial distribution** and **estimating snow leopard abundance using camera traps.**

Note: The **Nature Conservation Foundation (NCF),** Mysore is a non-governmental organisation that focuses on the conservation of India's wildlife and ecosystems.

➢ WWF-India, established as a Charitable Trust on 27th November 1969. It is a science-based organization which addresses issues such as the **conservation of species and its habitats, climate change, water and environmental education,** among many others.
  ○ WWF-India Secretariat is an autonomous office based in New Delhi. It is part of **WWF International**.

What are the Key Highlights of the Report?

➢ **Findings:**
  ○ The SPAI exercise recorded a **snow leopard population of 718 individuals** in India, providing crucial data for conservation efforts.
    • The report detailed the estimated presence of snow leopards in different states: **Ladakh (477), Uttarakhand (124), Himachal Pradesh (51), Arunachal Pradesh (36), Sikkim (21), and Jammu and Kashmir (9).**

➢ **Conservation Efforts and Recommendations:**
  ○ The report emphasises the need for establishing a **dedicated Snow Leopard Cell at WII** under the **MoEFCC** to focus on **long-term population monitoring.**
  ○ Consistent monitoring through periodic population estimation is proposed to ensure the long-term survival of snow leopards and to identify challenges, address threats, and formulate effective conservation strategies.

Note:

Snow Leopard

Panthera Uncia

Often referred to as the "ghost of the mountains"

HABITAT

- Mountainous regions of **Central and Southern Asia**
- **12** Range Countries
- In India:
  - **Western Himalayas:** Jammu and Kashmir, Ladakh, Himachal Pradesh
  - **Eastern Himalayas:** Uttarakhand and Sikkim and Arunachal Pradesh

MAJOR SITES

- Hemis National Park, Ladakh
  - **Snow leopard capital of the world**
- Great Himalayan National Park, Himachal Pradesh
- Gangotri National Park, Uttarakhand
- Khangchendzonga National Park, Sikkim

PROTECTION STATUS

- **Vulnerable:** IUCN Red List
- **Appendix I:** CITES
- **Schedule I:** Indian Wildlife (Protection) Act 1972

THREATS

- Human Snow Leopard Conflict
- Climate Change
- Loss of Prey and Habitat
- Poaching

CONSERVATION EFFORTS

- Global Snow Leopard and Ecosystem Protection (GSLEP) Programme
- Himal Sanrakshak- Community Volunteer Programme
- Project Snow Leopard
- Snow Leopard Conservation Breeding Programme- Padmaja Naidu Himalayan Zoological Park, West Bengal

Map labels: Russia, Kazakhstan, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, China, Afghanistan, Pakistan, Nepal, Bhutan, India

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National Board for Wildlife

- The National Board for Wildlife (NBWL) is the **apex body in India for all wildlife-related matters**.
- It is a **statutory body constituted under Section 5A of the Wildlife (Protection) Act, 1972.**
- It advises the government on policy matters concerned with wildlife conservation and preservation, and approves projects in and around national parks and other protected areas.
  - The NBWL is **chaired by the Prime Minister** and comprises 47 members, including three Members of Parliament, five NGOs, and 10 eminent ecologists, conservationists, and environmentalists.

Note:
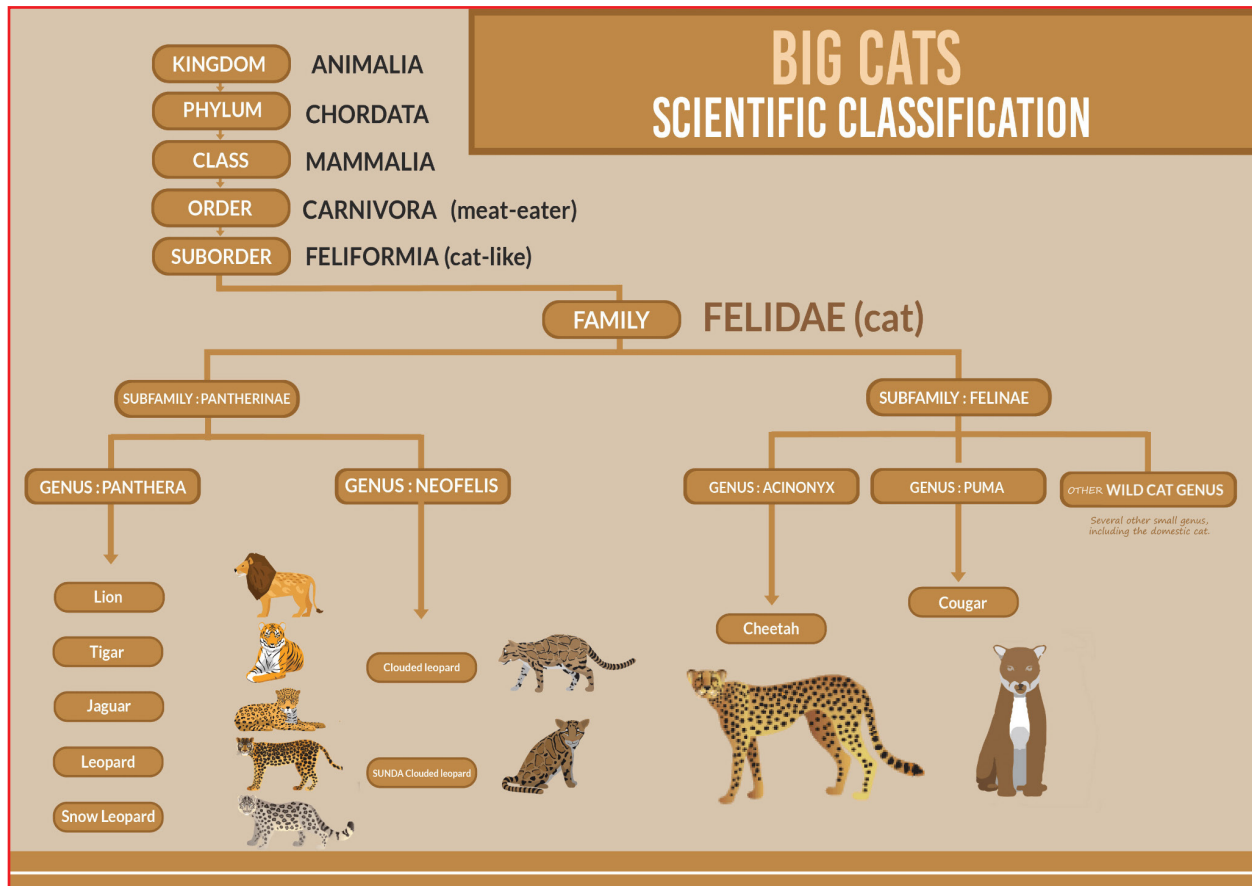
Radioactive Discharges from Indian Nuclear Plants

Why in News?

Recently, the researchers from **Bhabha Atomic Research Centre (BARC)** in an analysis has found that the **Radioactive Discharges from Indian Nuclear Plants** have been Minimal.

➢ The researchers analyzed the radiological data from six nuclear power plants in India over a period of 20 years (2000-2020).

Note: Radioactive discharge refers to the **release of radioactive substance**s into the environment as a result of **human activities, typically from nuclear facilities** such as nuclear power plants, research reactors, or other industrial processes involving radioactive materials.

Bhabha Atomic Research Centre
➢ BARC is India's premier nuclear research facility based in Mumbai, Maharashtra.
➢ It is a m**ulti-disciplinary research center** with extensive infrastructure for advanced research and development.
➢ Its core mandate is to sustain peaceful applications of nuclear energy, primarily for power generation.

Note:

No reason to worry

Minimal public doses underscore the safe operation of Indian nuclear power plants

- Radiological data of 20 years (2000-2020) from six Indian nuclear power plants were analysed; for the Kudankulam Nuclear Power Station, the data were from 2013 to 2020

- The study focussed only on the concentrations of fission products and neutron-activated nuclides values within 5 km of each nuclear plant; the monitored values were "insignificant" beyond 5 km radius

- Fission product noble gases, Argon 41, radioiodine, particulate radionuclides —cobalt-60, strontium-90, caesium-137 — and tritium released as gaseous waste were studied

- The liquid discharge consists of fission product radionuclides — radioiodine, tritium, strontium -90, caesium-137 — and activation products like cobalt-60

- In air particulates, the average radionuclides and the average iodine-131 activity concentration were below 1 mBq per cubic metre. For caesium-137 and strontium-90, the average concentrations were below 10 mBq per cubic metre

- In rivers and lakes, caesium-137 and strontium-90 concentrations were below 5 mBq per litre; the concentration was less than 50 mBq per litre in sea water near the nuclear plants

What are the Key Findings of the Analysis?

➢ **Minimal Environmental Impact:**

○ The radioactive discharges from the nuclear plants were found to have a minimal impact on the environment.

○ The concentrations of fission products **beyond 5 km radius** have been below the **minimum detectable activity** of the instruments used, implying that the monitored values are "insignificant".

➢ **Types of Radioactive Discharges:**

○ Gaseous waste released into the atmosphere includes fission product noble gases, Argon 41, radioiodine, and particulate radionuclides (cobalt-60, strontium-90, caesium-137, and tritium).

○ Liquid discharge c**onsists of Fission product radionuclide**s, radioiodine, tritium, strontium -90, caesium-137 — and activation products like cobalt-60. .

● Radioactive discharges are carried out through dilution and dispersion, adhering to strict radiological and environmental regulatory regimes.

➢ **Air Particulates:**

○ Average gross alpha activity in air particulates at all seven nuclear plants was **less than 0.1 megabecquerel (mBq) per cubic meter.**

○ The **Narora Atomic Power Station, Uttar Pradesh, exhibited** higher maximum values, attributed to a higher atmospheric dust load.

➢ **Specific Marker Concentrations:**

○ Average concentrations of radionuclides (iodine-131, caesium-137, and strontium-90) in air particulates across all sites were below 1 mBq per cubic meter.

○ Concentrations of **caesium-137 and strontium-90** in rivers, lakes, and sea water near the nuclear plants were below specified levels.

➢ **Sediment Concentrations:**

○ The concentrations of caesium-137 and strontium-90 in sediments were within the statistical variation of values observed in natural sediments, without showing any trend of deposition or accumulation.

➢ **Tritium Detection:**

○ Tritium was detectable above the minimum detectable activity at all sites except the **Kudankulam Nuclear Power Station.**

○ Tritium concentrations were relatively higher at the Rajasthan Atomic Power Station.

What is the Significance of the Findings?

➢ The findings hold potential **significance for reinforcing India's commitment** to advancing its nuclear power programme. The minimal public doses underscore the safe operation of Indian nuclear power plants.

What are the Implications of Radioactive Discharge?

➢ **Environmental Impact:**
  ○ Radioactive substances released into the environment can impact ecosystems, affecting plants, animals, and microorganisms.
  ○ Radioactive particles can **settle on soil and sedimen**t, leading to contamination. In water bodies, radioactive substances may accumulate, potentially affecting aquatic life.
    ● In **1986, the Chernobyl Disaster** released a significant amount of radioactive particles into the atmosphere. These particles settled on soil and water bodies, leading to **widespread contamination.** The nearby **Pripyat River** and its tributaries were affected, impacting aquatic life.

➢ **Human Health Concerns:**
  ○ Radioactive discharges can **expose nearby populations to ionizing radiatio**n. Prolonged or high-level exposure may increase the risk of radiation-related health issues, including cancer.
  ○ People may **inhale or ingest radioactive particles**, especially through contaminated air, water, or food. This can lead to internal radiation exposure.
    ● In the **Chernobyl disaster**, the exposed population, including workers and nearby residents, experienced i**ncreased rates of thyroid cancer** due to the **release of iodine-131.**

➢ **Long-term Health Risks:**
  ○ Exposure to certain radioactive substances, such as strontium-90 and caesium-137, is associated with an **increased risk of cancer,** particularly if the exposure is prolonged.
  ○ Ionizing radiation can potentially cause genetic mutations, increasing the risk of hereditary disorders in future generations.

➢ **Impact on Agriculture and Food Chain:**
  ○ If radioactive **substances enter the food chain,** agricultural products and livestock may become contaminated, posing risks to consumers.
  ○ In the **2011 Fukushima Nuclear Disaster,** nuclear radiation contaminated agricultural products, such as rice and fish, raising concerns about food safety.

➢ **Economic Consequences:**
  ○ Areas near nuclear facilities that **experience radioactive discharges** may see a decline in **property values** due to concerns about safety.
  ○ Repeated incidents of radioactive **discharge can harm the reputation** of the nuclear industry, potentially affecting investment and development of new projects.
    ● **Three Mile Island Accident (1979)** **contributed to a decline in public confidence in nuclear power**, leading to increased regulatory scrutiny and a **slowdown in the development of new nuclear projects** in the United States.

What are the Initiatives Related to Safe Radioactive Discharge?

➢ **International Conventions & Agreements:**
  ○ **Convention on Early Notification of a Nuclear Accident:** It is a treaty **adopted in 1986 by the International Atomic Energy Agency (IAEA)**.
    ● The treaty requires countries to provide prompt notification of any nuclear accident that may affect other countries.
  ○ **Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management:** It is a 1997 treaty from the IAEA. It was the first treaty to address radioactive waste management on a global scale.
    ● It aims to address the safety of spent fuel management and radioactive waste management, including the prevention of accidents and minimizing potential radiological hazards.
  ○ **Convention on Nuclear Safety (CNS):** The CNS is a **legally-binding treaty** that was adopted in 1994 and aims to ensure the safety of nuclear power plants. The CNS is an incentive-based treaty that requires states to establish and maintain a **regulatory framework for nuclear safety.** The CNS also aims to protect people, society, and the environment from the harmful effects of ionizing radiation.
  ○ **European Union (EU) Directives on Radioactive Waste and Spent Fuel Management**: The European

Note:

Union's (EU) Radioactive Waste and Spent Fuel Management Directive requires EU countries to have a national policy for managing radioactive waste and spent fuel.

- The directive also requires countries to create and implement national programs for managing these materials.

➢ **India's Initiatives:**

○ **Atomic Energy Regulatory Board (AERB)**: AERB serves as the regulatory body for nuclear and radiation safety in India. It establishes and enforces regulations, guidelines, and standards to ensure the safe operation of nuclear facilities, including measures for radioactive discharge.

○ **Environmental Impact Assessment (EIA):** Nuclear projects, including power plants, are subject to rigorous environmental impact assessments. These assessments evaluate potential environmental and health impacts, including radioactive discharges, before a project is approved.

○ **Effluent Treatment and Dilution:** Nuclear facilities employ effluent treatment systems to manage liquid radioactive waste before discharge. Dilution and dispersion techniques are often used to minimize the concentration of radioactive substances in discharges.

Acid Rain

Why in News?

Acid Rain is a complex environmental issue with multiple causes and widespread consequences, and it has its origins in **Fossil Fuels**.

What is Acid Rain?

➢ **About:**

○ **Acid rain or acid deposition** is a broad term that includes **any form of precipitation with acidic components,** such as sulfuric or nitric acid that fall to the ground from the atmosphere in wet or dry forms.

○ This can include **rain, snow, fog, hail** or even dust that is acidic.

➢ **Formation of Acid Rain:**

○ When SO2 (Sulphur Dioxide) and NOx (Nitrogen Oxide) **combine with water and oxygen** in the atmosphere, they form sulfuric acid (H_2SO_4) and nitric acid (HNO_3), respectively.

○ These acids then **dissolve in water droplets**, leading to the creation of acid rain, snow, or fog.

- The typical **pH (Potential of Hydrogen)** of acid rain is around 4.2-4.4, making it more acidic than normal rain (which has a pH of around 5.6).

The pH Scale

Increasingly Acidic — Neutral — Increasingly Basic

0 — Battery Acid
1
2 — Lemon Juice
3 — Vinegar
4 — Cola
5 — Coffee
6 — Milk
7 — Water — Neutral
8
9 — Baking Soda, Sea Water
10 — Soap
11
12 — Ammonia
13
14 — Lye

Acid Rain
Adult Fish Die
Fish Reproduction Affected
Normal Range of Precipitation
Normal Range of Stream Water
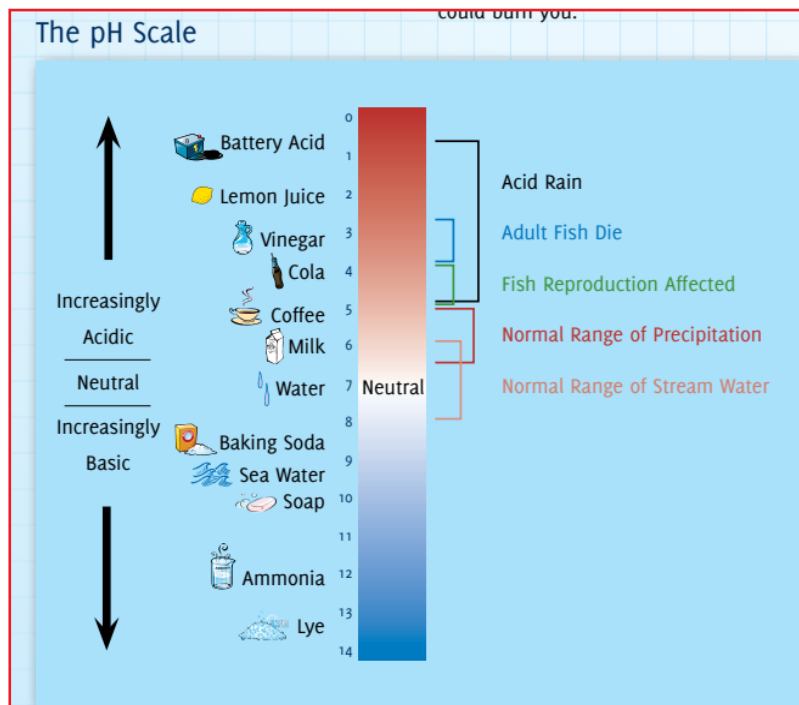
Note:

- ➢ **Causes of Acid Rain:**
  - ○ **Fossil Fuel Combustion:** Burning **Fossil Fuels,** particularly those containing sulfur, release sulfur dioxide (SO2) and, at higher temperatures, nitrogen oxides (NOx).
    - ● Fossil fuel combustion is prevalent in **vehicles such as automobiles**, and is a primary source of environmental pollutants.
    - ● The **combustion of coal in power plants** and industrial processes also releases these substances.
  - ○ **Natural Sources: Volcanic Eruptions** and **Lightning** also contribute to the presence of **sulfur dioxide and nitrogen oxides in the atmosphere.**
  - ○ **Air Pollution:** In the atmosphere, the pollutants SO2 and NOx undergo chemical reactions, forming sulfuric and nitric acids.
    - ● When combined with water vapor, t**hey create acid rain during precipitation.**
- ➢ **Forms of Acid Rain/Deposition:**
  - ○ **Wet Deposition:** The sulfuric and nitric acids formed in the atmosphere fall to the **ground mixed with rain**, snow, fog, or hail.
  - ○ **Dry Deposition:** Acidic particles and gases can also deposit from the atmosphere in the absence of moisture as dry deposition.
    - ● The acidic particles and gases may deposit to surfaces (water bodies, vegetation, buildings) quickly or may react during atmospheric transport to form larger particles that can be harmful to human health.

What are the Impacts of Acid Rain?

- ➢ **Impact on Aquatic Life:**
  - ○ Acid rain can **make water bodies**, such as rivers and lakes, **inhospitable to certain species** of aquatic life such as trout and fish.
  - ○ The increased **acidity disrupts their reproductive patterns** and can lead to fish population decline in affected rivers and lakes.
- ➢ **Impacts on Marine Water and Species Distribution:**
  - ○ The increased acidity alters the pH of marine environments, adversely impacting the distribution and survival of various organisms.
  - ○ **Shell-forming marine species**, like mollusks and certain types of plankton, face particular challenges as acidification interferes with their ability to build and maintain protective shells.

- ➢ **Impacts on Physical Infrastructure:**
  - ○ Acid rain poses substantial threats to physical structures and monuments, **causing deterioration and discoloration.**
  - ○ Notable examples include the **Taj Mahal, whose iconic white marble** has been affected, **exhibiting a yellowish hue due to sulfuric acid reactions.**
    - ● Similarly, buildings, statues, and bridges made of **limestone or marble are vulnerable to corrosion and decay.**
  - ○ **Acid rain accelerates the erosion of surfaces,** compromising the structural integrity of architectural landmarks.

What are the Acid Rain Mitigation Measures?

- ➢ **Flue-Gas Desulphurisation:**
  - ○ Coal power plants have implemented technologies like **flue-gas desulphurisation** to reduce sulphur dioxide emissions by more than 90%.
- ➢ **Graded Response Action Plan (GRAP):**
  - ○ **GRAP** is a set of emergency measures that kick in to prevent further deterioration of air quality once it reaches a certain threshold in the Delhi-NCR region.
  - ○ It was approved by the **Supreme Court** in the case of *M. C. Mehta vs. Union of India 2016* and notified in 2017.
- ➢ **BS-VI vehicles**
- ➢ **New Commission for Air Quality Management**
- ➢ **Air Quality and Weather Forecasting and Research (SAFAR)**
- ➢ **National Air Quality Index (AQI)**
- ➢ **Air (Prevention and Control of Pollution) Act, 1981**
- ➢ **International Cooperation:**
  - ○ Governments worldwide collaborate to minimize acid rain, as seen in initiatives such as the **Acid Deposition Monitoring Network in East Asia (EANET).**
    - ● EANET is an intergovernmental initiative among **East Asian countries** to monitor and deal with acid deposition, which includes acid rain.
    - ● It collects data on the **deposition of acid substances**, such as sulfur dioxide and nitrogen oxides, in the atmosphere and their subsequent impact on the environment, particularly ecosystems and water bodies.

Note:

What are the Differences Between Acid and Base?

Characteristic	Acids	Bases
Definition	Donate protons (H^+ ions)	Accept protons (H^+ ions) or donate pairs of electrons
pH on the Scale	Less than 7 (lower pH indicates stronger acid)	Greater than 7 (higher pH indicates stronger base)
Ion Formation	Produce hydrogen ions (H^+) when dissolved in water	Produce hydroxide ions (OH^-) when dissolved in water
Taste	Sour	Bitter
Feel (on Skin)	Can be corrosive and may cause a burning sensation	Slippery and soapy feeling
Examples	Hydrochloric acid (HCl), sulfuric acid (H_2SO_4)	Sodium hydroxide (NaOH), potassium hydroxide (KOH)

■■■

Note:

Security

Highlights

- *National Terrorism Data Fusion & Analysis Centre*

CYBER SECURITY

Cybersecurity refers to any technology, measure, or practice for preventing cyberattacks or mitigating their impact.

CYBER SECURITY ATTACKS

Man in The Middle Attack | Password Attacks | Brute Force Attack | Spyware and Keylogger | Cross-Site Scripting

Phishing Attack | Dos / DDos | Vishing Attack | Viruses | Malware Attack | SQL Injection Attack

'Crime in India' Report 2022 (NCRB) highlighted 24.4% surge in cybercrimes in India since 2021.

Common Cybersecurity Myths

- Strong passwords alone are adequate protection
- Major cybersecurity risks are well-known
- All cyberattack vectors are contained
- Cybercriminals don't attack small businesses

Cyber Warfare

- Digital attacks to disrupt vital computer systems, to inflict damage, death, and destruction.

CYBER THREAT ACTORS

CYBER THREAT ACTOR	MOTIVATION
NATION-STATES	GEOPOLITICAL
CYBERCRIMINALS	PROFIT
HACKTIVISTS	IDEOLOGICAL
TERRORIST GROUPS	IDEOLOGICAL VIOLENCE
THRILL-SEEKERS	SATISFACTION
INSIDER THREATS	DISCONTENT

Types of Cybersecurity

- Critical infrastructure security (Robust access controls)
- Network security (Deploying firewalls)
- Application security (Code reviews)
- Cloud Security (Tokenization)
- Information security (Data masking)

Recent Major Cyber Attacks

- WannaCry Ransomware Attack (2017)
- Cambridge Analytica Data Breach (2018)
- Financial data of 9M+ cardholders, including SBI, leaked (2022)

Regulations & Initiatives

- **International:**
  - UN Group of Governmental Experts (GGE) on Advancing Responsible State Behaviour in Cyberspace
  - NATO's Cooperative Cyber Defense Centre of Excellence (CCDCOE)
  - Budapest Convention on Cybercrime, 2001 (**India not a signatory**)
- **India:**
  - IT Act, 2000 (Sections 43, 66, 66B, 66C, 66D)
  - National Cyber Security Policy, 2013
  - National Cyber Security Strategy 2020
  - Cyber Surakshit Bharat Initiative
  - Indian Cyber Crime Coordination Centre (I4C)
  - Computer Emergency Response Team-India (CERT-In)

Steps Needed for Cyber Security

- Network Security
- Malware Protection
- Incident Management
- User Education and Awareness
- Secure Configuration
- Managing User Privileges
- Information Risk Management Regime

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National Terrorism Data Fusion & Analysis Centre

Why in News?

Recently, the **National Investigation Agency (NIA)** has developed the **National Terrorism Data Fusion & Analysis Centre (NTDFAC)**, which makes the government collect and compile information on terrorists and their associates from various sources.

- ❍ The NIA has for the first time collected **details of all terrorists** including those from **Indian Mujahideen and Lashkar-e-Taiba** as well as Khalistani militant groups.

What is the National Terrorism Data Fusion & Analysis Centre?

➢ **About:**
- ❍ The NTDFAC has been modelled along the lines of the **Global Terrorism Database (GTD)** of the US.
  - ● The GTD is managed by the National Consortium for the Study of Terrorism and Responses to Terrorism (START), based at the University of Maryland in the United States.
  - ● The GTD is a publicly accessible database that collects and analyzes data on terrorist incidents globally. It provides detailed information on various aspects of each incident, including the date, location, weapons used, tactics employed, targets, and the number of casualties.
- ❍ It will serve as a **centralized database and analysis centre** for information related to terrorism and terrorists operating in the country.
  - ● In 2023, the Ministry of Home Affairs had asked all state police forces and anti-terror agencies to adopt an approach to prevent the formation of new terrorist groups.

➢ **Key Features:**
- ❍ **Comprehensive Database:** This includes case histories, fingerprints, videos, pictures, and social media profiles, providing a comprehensive overview of individuals involved in terrorist activities.
- ❍ **Automated Fingerprint Identification System (AFIS):** The NTDFAC incorporates the **National Automated Fingerprint Identification System (NAFIS)**, which holds **over 92 lakh fingerprint records.**

- ● This allows for the **quick and accurate identification of individuals** based on fingerprint data.
- ❍ **Face Recognition System:** It is equipped **with a face recognition system,** enabling the **scanning of pictures of suspects from CCTV footage**. This technology aids in the identification and tracking of individuals involved in terrorist activities.
- ❍ **Support for State Police Forces:** The **NTDFAC not only assists NIA officers but also supports state police forces** in identifying details of suspects.
  - ● State police forces can access the centralised server to gather information on terrorists operating in their jurisdictions.

What is the National Automated Fingerprint Identification System (NAFIS)?

➢ **About:**
- ❍ Conceptualized and managed by the **National Crime Records Bureau (NCRB),** it is a country-wide **searchable database of crime- and criminal-related fingerprints.**
- ❍ The web-based application functions as a central information repository by consolidating fingerprint data from all states and Union Territories.

➢ **Key Features:**
- ❍ **Web-Based Application:** The system operates as a web-based application, allowing law enforcement agencies to access and manage fingerprint data in real-time on a 24x7 basis.
- ❍ **Unique Identifier:** NAFIS assigns a unique 10-digit **National Fingerprint Number (NFN)** to each person arrested for a crime.
  - ● This unique ID can be used for the person's lifetime, and different crimes registered under **different FIRs will be linked to the same NFN.**
- ❍ **Integration with CCTNS:** NAFIS is connected to the **Crime and Criminal Tracking Network & Systems (CCTNS)** database at the backend, providing a unique identifier for every arrested person in the CCTNS.
- ❍ **Real-Time Data Upload and Retrieval:** The system enables law enforcement agencies to upload, trace, and retrieve fingerprint data in real time, enhancing the efficiency of criminal identification processes.
- ❍ **Replacement for Previous Systems:** NAFIS is the latest iteration in a series of automated fingerprint identification systems in India. It **replaces the previous system, FACTS 5.0,** which was considered to have "outlived its shelf life."

Note:

What is the National Investigation Agency (NIA)?

➢ **About:**
   ○ The NIA is the **Central Counter-Terrorism Law Enforcement Agency** of India mandated to investigate **all the offences affecting the sovereignty, security and integrity of India.** It includes:
   - Friendly relations with foreign states.
   - Against atomic and nuclear facilities.
   - Smuggling of arms, drugs and fake Indian currency and infiltration from across the borders.
   - The offences under the statutory laws enacted to implement international treaties, agreements, conventions and resolutions of the **United Nations,** its agencies and other international organisations.
   ○ It was constituted under the **National Investigation Agency (NIA) Act, 2008**.
   ○ The agency is empowered to **deal with the investigation of terror related crimes across states without special permission from the states** under written **proclamation from the Ministry of Home Affairs.**
   ○ **Headquarters: New Delhi**

➢ **Origin:**
   ○ In the wake of the **26/11 Mumbai terror attack** in November 2008, which shocked the entire world, the then United Progressive Alliance government decided to establish the NIA.

➢ **Jurisdiction:**
   ○ The law under which the agency **operates extends to the whole of India** and also **applies to Indian citizens outside the country.**
   ○ **Persons in the service of the government** wherever they are posted.
   ○ Persons on **ships and aircraft registered in India** wherever they may be.
   ○ Persons who **commit a scheduled offence beyond India against the Indian citizen or affecting the interest of India.**

What are Scheduled Offences?

➢ The **schedule to the Act specifies a list of offences** which are to be investigated and prosecuted by the NIA.
➢ The list includes:
   ○ **Explosive Substances Act**
   ○ **Atomic Energy Act**
   ○ **Unlawful Activities (Prevention) Act**
   ○ **Anti-Hijacking Act**
   ○ **Suppression of Unlawful Acts against Safety of Civil Aviation Act**
   ○ **SAARC Convention (Suppression of Terrorism) Act**
   ○ Suppression of Unlawful Acts Against Safety of Maritime Navigation and Fixed Platforms on Continental Shelf Act
   ○ **Weapons of Mass Destruction and their Delivery Systems (Prohibition of Unlawful Activities) Act**
   ○ Any other relevant offences under the Indian Penal Code, **Arms Act** and the **Information Technology Act**.
   ○ **Narcotic Drugs and Psychotropic Substances Act**

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Note:

Art and Culture

Highlights

- *Maratha Military Landscapes*

Maratha Military Landscapes

Why in News?

India is set to nominate the **"Maratha Military Landscapes"** for the <u>**United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage recognition**</u> in 2024-25.

➢ This nomination comprises 12 components, showcasing the strategic military prowess of the Maratha rule across various regions.

What are the Maratha Military Landscapes?

➢ The 'Maratha Military Landscapes' is a network of 12 forts and fortifications that represent the **extraordinary military system** and strategy of the Maratha rulers in the 17th-19th centuries

  ○ The twelve parts of this nomination are, **Salher Fort, Shivneri Fort, Lohgad, Khanderi Fort, Raigad, Rajgad, Pratapgad, Suvarnadurg, Panhala Fort, Vijay durg, Sindhudurg in Maharashtra** and **Gingee Fort in Tamil Nadu.**

➢ The Maratha Military Landscapes of India are included in the <u>**Tentative List of World Heritage sites**</u> **in 2021.**

  ○ Maratha Military Landscapes is the **sixth cultural property nominated** for inclusion in the World Heritage List from Maharashtra.

○ This network of forts, varying in hierarchies, scales and typological features, is a result of integrating the landscape, terrain and physiographic characteristics distinctive to the **<u>Western Ghats</u> (Sahyadri Hills), the Konkan Coast, Deccan Plateau and the Eastern Ghats** in the Indian Peninsula.

➢ There are more than 390 forts in Maharashtra out of which only 12 forts are selected under the Maratha Military Landscapes of India, of these 8 forts are protected by the **<u>Archaeological Survey of India</u>**.

  ○ These are Shivneri Fort, Lohgad, Raigad, Suvarnadurg, Panhala Fort, Vijaydurg, Sindhudurg and Gingee Fort.

  ○ Salher Fort, Rajgad, Khanderi Fort and Pratapgarh are **protected by the Directorate of Archaeology and Museums,** Government of Maharashtra.

➢ In the Maratha Military Landscapes of India Salher Fort, Shivneri Fort, Lohgad, Raigad, Rajgad and Gingee Fort are **hill forts,** Pratapgad is a **hill-forest fort,** Panhala is a **hill-plateau fort,** Vijaydurg is **coastal fort** whereas Khanderi fort, Suvarnadurg and Sindhudurg are **island forts.**

  ○ The Maratha Military ideology originated in the 17th century under the rule of **<u>Chhatrapati Shivaji Maharaj</u>** in 1670 CE, extending through subsequent rulers until the Peshwa rule concluded in 1818 CE.
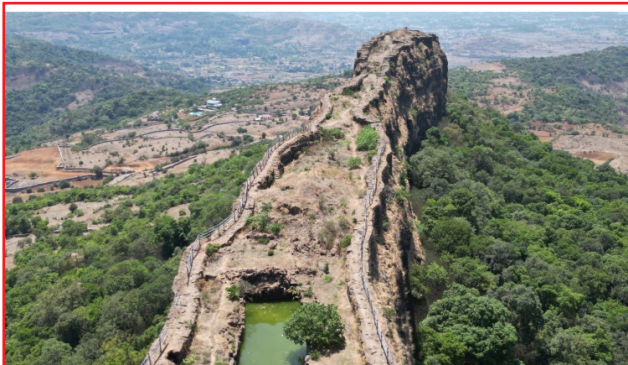
Lohagard fort

Raigad Fort

Note:

➢ At present in India there are **42 World Heritage sites,** out of which **34 are cultural sites, 7 are natural sites** and **one is mixed sites.**

  ❍ In Maharashtra there are **six World Heritage Sites, five cultural and one natural.**

   ● These are, **Ajanta Caves (1983), Ellora Caves (1983)**, **Elephanta Caves** (1987), Chhatrapati Shivaji Maharaj Terminus (formerly Victoria Terminus) (2004), **Victorian Gothic and Art Deco Ensembles** of Mumbai (2018) and **western Ghats** of Maharashtra, Karnataka, Tamil Nadu and Kerala is serial property in natural category (2012).

UNESCO World Heritage Sites

UTTARAKHAND
● Nanda Devi and Valley of Flowers National Parks

HIMACHAL PRADESH
● Great Himalayan National Park Conservation Area

DELHI
● Humayun's Tomb
● Qutb Minar and its Monuments
● Red Fort Complex

BIHAR
● Archaeological Site of Nalanda Mahavihara at Nalanda
● Mahabodhi Temple Complex at Bodh Gaya

CHANDIGARH
● The Architectural Work of Le Corbusier, an Outstanding Contribution to the Modern Movement

SIKKIM
● Khangchendzonga National Park

ASSAM
● Kaziranga National Park
● Manas Wildlife Sanctuary

RAJASTHAN
● Hill Forts of Rajasthan
  1. Jaisalmer Fort, 2. Chittorgarh Fort,
  3. Kumbhalgarh Fort, 4. Gagron Fort,
  5. Ranthambore Fort, 6. Amber Fort
● Keoladeo National Park
● The Jantar Mantar, Jaipur
● Jaipur City, Rajasthan

GUJARAT
● Dholavira: a Harappan City
● Historic City of Ahmadabad
● Champaner-Pavagadh Archaeological Park
● Rani-ki-Vav (the Queen's Stepwell) at Patan

WEST BENGAL
● Sundarbans National Park

ODISHA
● Sun Temple, Konark

MAHARASHTRA
● Ellora Caves
● Ajanta Caves
● Elephanta Caves
● Chhatrapati Shivaji Terminus (formerly Victoria Terminus)
● Victorian Gothic and Art Deco Ensembles of Mumbai

UTTAR PRADESH
● Agra Fort
● Taj Mahal
● Fatehpur Sikri

MADHYA PRADESH
● Buddhist Monuments at Sanchi
● Rock Shelters of Bhimbetka
● Khajuraho Group of Monuments

GOA
● Churches and Convents of Goa

KARNATAKA
● Group of Monuments at Pattadakal
● Group of Monuments at Hampi

TELANGANA
● Kakatiya Rudreshwara (Ramappa) Temple

TAMIL NADU
● Group of Monuments at Mahabalipuram
● Great Living Chola Temples

■ Western Ghats

Mountain Railways of India
● Darjeeling Himalayan Railway – West Bengal
● Nilgiri Mountain Railways – Tamil Nadu
● Kalka Shimla Railway – Himachal Pradesh

FACTS
❍ **Total Number of World Heritage Sites in India:** 40
❍ **Total Cultural Heritage Sites:** 32
❍ **Total Natural Sites:** 7 (Kaziranga National Park, Manas Wildlife Sanctuary, Western Ghats, Sundarbans National Park, Nanda Devi and Valley of Flowers National Parks, Great Himalayan National Park Conservation Area, Keoladeo National Park)
❍ **Mixed Site:** 1 (Khangchendzonga National Park)
❍ **World Heritage Sites Listed First:** Taj Mahal, Agra Fort, Ajanta Caves and Ellora Caves (all in 1983)
❍ **Latest Addition (2021):** Harappan city of Dholavira (40th site), Kakatiya Rudreshwara (Ramappa) Temple (39th site)
❍ **Countries With the Most UNESCO World Heritage Sites:** Italy (58), China (56), Germany (51), France (49), Spain (49)
❍ **India is 6th in number of World Heritage Sites in the World**

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What is the Process for the UNESCO World Heritage List nomination?

➢ The World Heritage List is a list of sites that have **outstanding universal value for humanity and nature,** as determined by the United Nations Educational, Scientific and Cultural Organization (UNESCO).

➢ **Before 2004,** World Heritage sites were selected **based on six cultural and four natural criteria.**
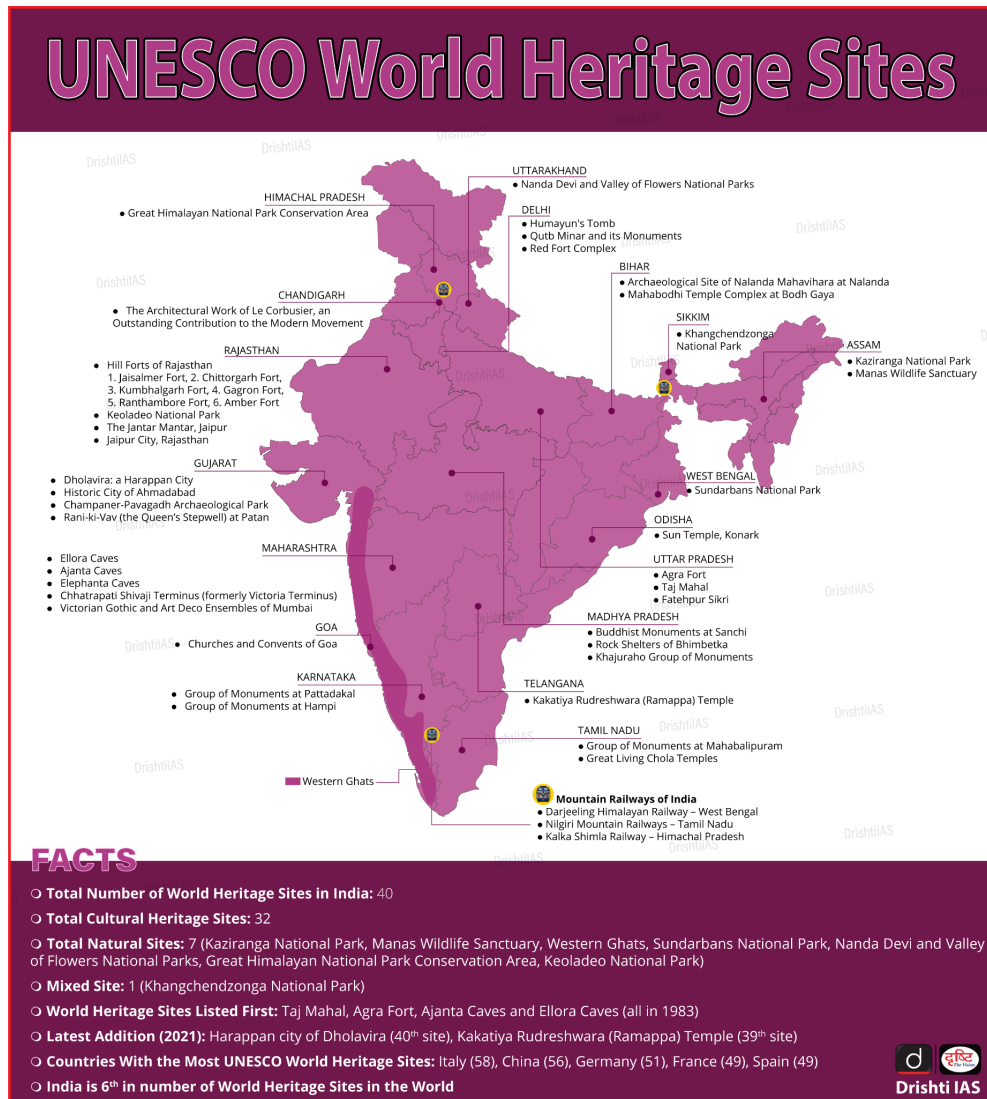
  ❍ **In 2005,** UNESCO modified these criteria and now has **one set of ten criteria.** Nominated sites must be of "outstanding universal value" and must **meet at least one of the ten criteria.**

Note:

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Selection criteria

(i)

to represent a masterpiece of human creative genius;

(ii)

to exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design;

(iii)

to bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared;

(iv)

to be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history;

(v)

to be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change;

(vi)

to be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (The Committee considers that this criterion should preferably be used in conjunction with other criteria);

(vii)

to contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;

(viii)

to be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features;

(ix)

to be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals;

(x)

to contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

Operational Guidelines (year)	Cultural criteria						Natural criteria			
2002	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(i)	(ii)	(iii)	(iv)
2005	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(viii)	(ix)	(vii)	(x)

Note:

- There are **two categories of nomination** cultural and natural criteria, the Maratha Military landscapes is nominated in the category of cultural criteria.
  - There are **six criteria (i to vi) for cultural sites and four criteria (vii to x) for natural sites** for inclusion in the World Heritage List.
- The **Maratha Military Landscapes of India is nominated under Criterion (iii), Criterion (iv) and Criterion (vi).**
- A country can't nominate a property to the **World Heritage List unless it's been on its Tentative List for at least one year.**
  - A **Tentative List is an inventory of potential World Heritage Sites** that a country submits to UNESCO. After a property is on the Tentative List, the country can nominate it for the World Heritage List. The World Heritage Committee will review the nomination.
- The list of World Heritage Sites is maintained by the International **'World Heritage Programme',** administered by the **UNESCO World Heritage Committee.**

    Read more:

■■■

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Geography

Highlights

- *Atlantic Meridional Overturning Circulation*
- *Atmospheric River*
- *Hindu Kush Himalayas*

Atlantic Meridional Overturning Circulation

Why in News?

The **Atlantic Meridional Overturning Circulation (AMOC)** is at risk of imminent collapse, with recent studies indicating that **anthropogenic emissions** could expedite this between **2025 and 2095.**
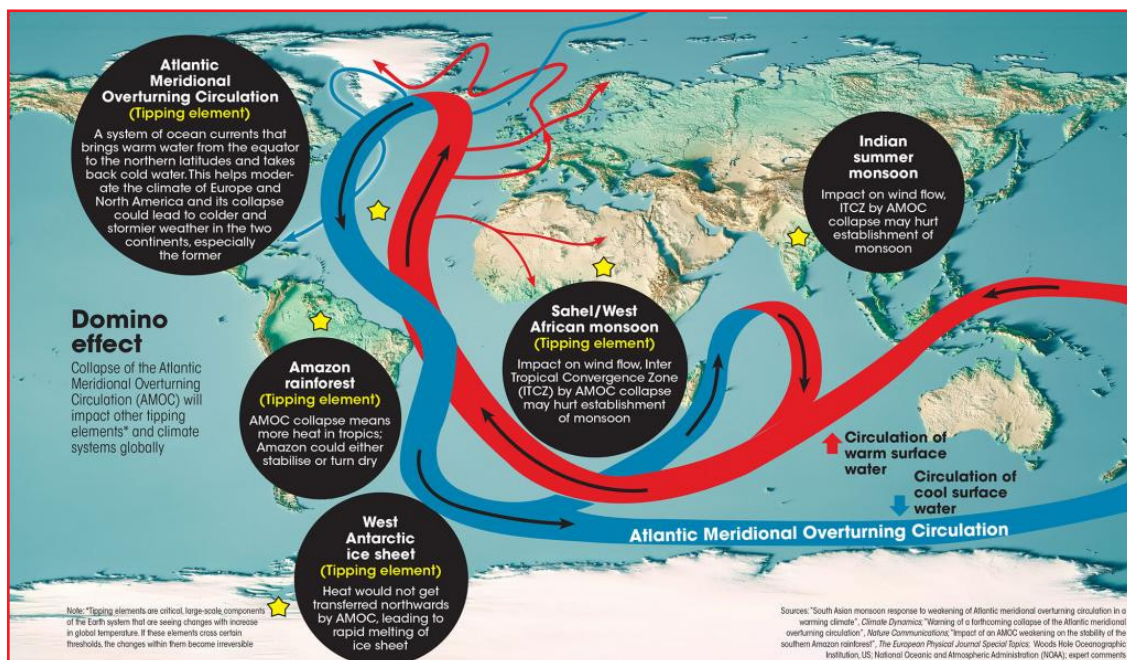
What is AMOC?

➢ **About**:
  - AMOC is a large-scale oceanic circulation system that transports **warm surface waters from the tropics** to the northern latitudes and returns cold, deep waters from the **North Atlantic** back towards the equator.
    - It plays a crucial role in redistributing heat globally, influencing regional and global climates, especially moderating temperatures in Europe, North America, and near the Equator.

➢ **Mechanism:**
  - Warm water from the tropics moves towards the northern latitude, carrying heat energy which warms places like Europe.
  - As it travels, the warm water cools down due to contact with the colder air of northern latitude and mixes with cold freshwater from **melting Arctic ice.**
  - This cooler, denser water sinks to deeper layers of the ocean, mainly in the **North Atlantic,** and then flows back southwards along the ocean floor.
  - This southward flow, known as the **deep limb of the AMOC,** helps to distribute heat and nutrients across the ocean.
  - Eventually, the water resurfaces in the tropics and warms up again, completing the circulation cycle of the AMOC.

Atlantic Meridional Overturning Circulation (Tipping element)
A system of ocean currents that brings warm water from the equator to the northern latitudes and takes back cold water. This helps moderate the climate of Europe and North America and its collapse could lead to colder and stormier weather in the two continents, especially the former

Domino effect
Collapse of the Atlantic Meridional Overturning Circulation (AMOC) will impact other tipping elements* and climate systems globally

Indian summer monsoon
Impact on wind flow, ITCZ by AMOC collapse may hurt establishment of monsoon

Amazon rainforest (Tipping element)
AMOC collapse means more heat in tropics; Amazon could either stabilise or turn dry

Sahel/West African monsoon (Tipping element)
Impact on wind flow, Inter Tropical Convergence Zone (ITCZ) by AMOC collapse may hurt establishment of monsoon

West Antarctic ice sheet (Tipping element)
Heat would not get transferred northwards by AMOC, leading to rapid melting of ice sheet

Circulation of warm surface water
Circulation of cool surface water

Atlantic Meridional Overturning Circulation

Note: *Tipping elements are critical, large-scale components of the Earth system that are seeing changes with increase in global temperature. If these elements cross certain thresholds, the changes within them become irreversible

Sources: "South Asian monsoon response to weakening of Atlantic meridional overturning circulation in a warming climate", Climate Dynamics; "Warning of a forthcoming collapse of the Atlantic meridional overturning circulation", Nature Communications; "Impact of an AMOC weakening on the stability of the southern Amazon rainforest", The European Physical Journal Special Topics; Woods Hole Oceanographic Institution, US; National Oceanic and Atmospheric Administration (NOAA); expert comments

Note:

➢ **Role of Indian Ocean:** As the **Indian Ocean warms** faster and faster, it **generates additional precipitation**. This **draws more air** from other parts of the world to the Indian Ocean, including the Atlantic. With so much precipitation in the Indian Ocean, there will be **less precipitation in the Atlantic** Ocean.

  ○ Less precipitation will **lead to higher salinity in the waters of the tropical portion of the Atlantic** — because there won't be as much rainwater to dilute it.

  ○ This saltier water in the Atlantic, as it comes north via AMOC, will get cold much quicker than usual and sink faster.

  ○ This would act as a jump start for AMOC, intensifying the circulation.

➢ **Contribution to Global Climate:** This cycle acts like a **heat conveyor belt,** warming the northern latitudes and cooling the southern latitudes, contributing to the overall stability of the Earth's climate.

➢ **Threat:** Rising precipitation and accelerated melting of the **Greenland ice sheet** have introduced more cold freshwater into the North Atlantic.

  ○ This influx has lowered water salinity and density, causing the colder ocean layer to expand while the warmer layer contracts.

  ○ Consequently, the AMOC is slowing down, posing a risk of collapse.

  ○ Also, anthropogenic activities, such as **greenhouse gas emissions**, can influence ocean temperatures and circulation patterns, further affecting the AMOC.

➢ **Potential Cascading Effects:**

  ○ AMOC collapse may **alter precipitation patterns**, potentially destabilizing the **southern Amazon rainforest** and transforming it into a savannah-like ecosystem.

  ○ Increased ocean heat in the southern hemisphere could accelerate the melting of the **West Antarctic ice sheet**, exacerbating sea-level rise.

  ○ Weakening of monsoon circulation in regions like South Asia and Africa could have far-reaching consequences for **agriculture, water resources, and regional climates.**

Atmospheric River

Why in News?

California, US is currently grappling with an extraordinary weather phenomenon known as an **Atmospheric River** also called Pineapple Express Storm, which has the potential to unleash up to 8 **trillion gallons of rain over the state.**

What is an Atmospheric River?

➢ **About:**

  ○ The atmospheric river is a **long, narrow band of moisture-filled air that** transports significant amounts of water vapor from the tropics to higher latitudes.

    ● The Atmospheric River is often associated with **mT (Maritime Tropical)** air mass.

  ○ When these rivers make landfall, they release **this moisture as intense precipitation**, which can manifest as **either rain or snow** depending on the altitude and temperature.

    ● According to the **National Oceanic and Atmospheric Administration (NOAA),** the water vapor they carry is **roughly equivalent to the average flow of water** at the mouth of the Mississippi River.

  ○ So, when they make landfall and release all that water, they can cause extreme flooding.

➢ **Pineapple Express:**

  ○ The "Pineapple Express" is a well-known example of atmospheric river storms that bring **heavy rainfall to the US West Coast**, particularly California.

  ○ This name originates from the fact that these storms draw moisture from the tropical waters near the Hawaiian Islands, **resembling a "express" train of moisture originating** from the vicinity of Hawaii, which is often associated with pineapples.

    ● This atmospheric river is driven by a **strong southern branch of the polar jet stream** and transports humid, warm mT air from as far away as the Hawaiian Islands.

Note:

The science behind atmospheric rivers

An atmospheric river (AR) is a flowing column of condensed water vapor in the atmosphere responsible for producing significant levels of rain and snow, especially in the Western United States. When ARs move inland and sweep over the mountains, the water vapor rises and cools to create heavy precipitation. Though many ARs are weak systems that simply provide beneficial rain or snow, some of the larger, more powerful ARs can create extreme rainfall and floods capable of disrupting travel, inducing mudslides and causing catastrophic damage to life and property. Visit www.research.noaa.gov to learn more.

A strong AR transports an amount of water vapor roughly equivalent to 7.5–15 times the average flow of water at the mouth of the Mississippi River.

ARs are a primary feature in the entire global water cycle and are tied closely to both water supply and flood risks, particularly in the Western U.S.

On average, about 30-50% of annual precipitation on the West Coast occurs in just a few AR events and contributes to the water supply — and flooding risk.

ARs move with the weather and are present somewhere on Earth at any given time.

ARs are approximately 250–375 miles wide on average.

Scientists' improved understanding of ARs has come from roughly a decade of scientific studies that use observations from satellites, radar and aircraft as well as the latest numerical weather models. More studies are underway, including a 2015 scientific mission that added data from instruments aboard a NOAA ship.

WATER VAPOR COOLS

CALIFORNIA

Image not to scale.

3/2015

- ➢ **Categories:**
  - ○ **Category 1 (Weak):** A Category 1 atmospheric river would be a milder and briefer weather event with **primarily beneficial effects, like 24 hours of modest rainfall.**
  - ○ **Category 2 (Moderate):** A Category 2 atmospheric river is a moderate storm with mostly beneficial effects, but **also somewhat hazardous.**
  - ○ **Category 3 (Strong):** A Category 3 atmospheric river is **more powerful and longer lasting**, with a balance of beneficial and hazardous impacts. For example, a storm in this category could bring 5-10 inches of rain over 36 hours, enough to **help replenish reservoirs but also pushing some rivers close to flood stage.**
  - ○ **Category 4 (Extreme):** A Category 4 atmospheric river is mostly hazardous, though also with some beneficial aspects. A storm of this rating could dump enough heavy rain over several days to bring many rivers to flood stage.
  - ○ **Category 5 (Exceptional):** A Category 5 atmospheric river is primarily hazardous.
    - ● An atmospheric river that lasted over 100 hours over the Central California coast during the 1996-97 New Year's holiday period. The heavy rain and runoff caused over USD 100 billion in damage.

Note:
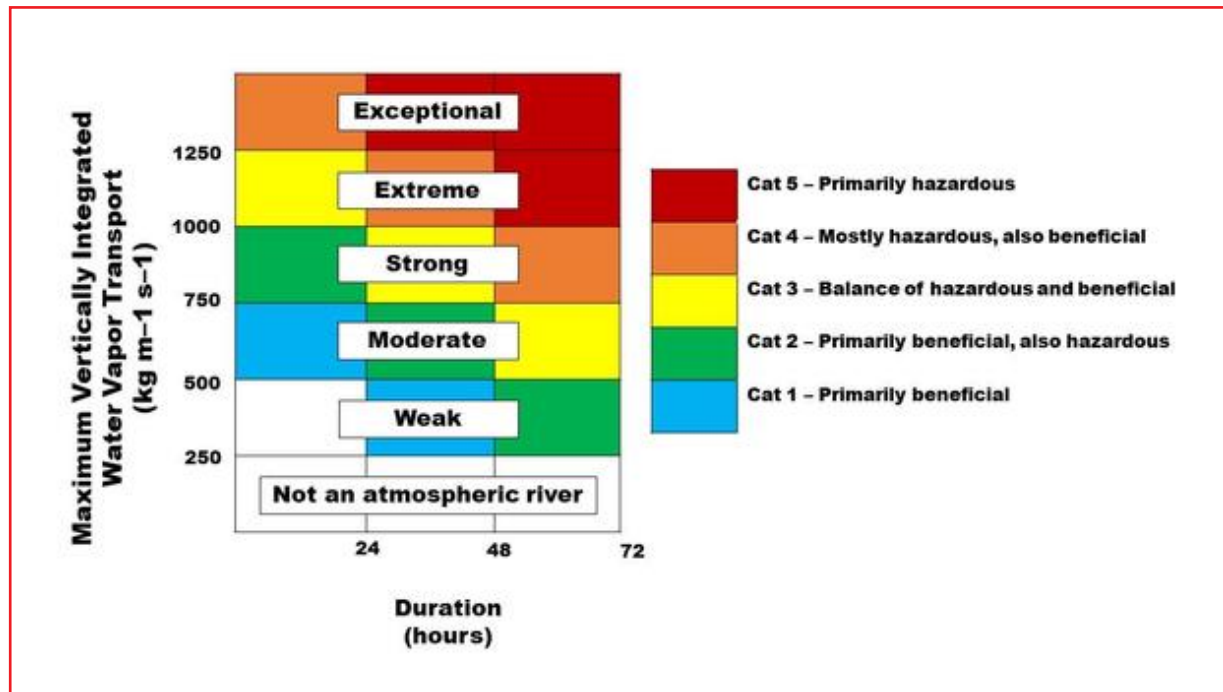
> **Significance:**
>   ○ They play a crucial role in r**eplenishing water supplies,** particularly in regions like the western United States. The heavy precipitation they bring can contribute significantly to reservoir levels, helping to alleviate drought conditions and ensuring water availability for agricultural, industrial, and domestic use.
>   ○ Given their importance for water supply, understanding atmospheric rivers is essential for **effective water resource management and planning.** This includes strategies for water storage, flood control, and allocation of water resources to meet various demands.
>   ○ Atmospheric rivers contribute to **maintaining a balance in the hydrological cycle** by transporting **large amounts of water vapor** from the tropics to higher latitudes. This helps to redistribute **moisture across different regions, supporting ecosystems** and agricultural productivity.

Note: An atmospheric river should not be confused with a traditional river found on the Earth's surface. Unlike a visible water body, an atmospheric river is an invisible, elongated corridor in the sky that carries large amounts of water vapor, influencing weather patterns and precipitation.

How Common are Atmospheric Rivers, and Where do They Occur?

> They're not limited to the US West Coast; they can occur worldwide. These rivers of moisture can stretch thousands of miles and affect regions **like the UK, Ireland, Norway, and China.**
>   ○ Atmospheric rivers often make the rainy season in China, known as **Mei-Yu season, even worse.**
> While they only account for 17% of storms on the US West Coast, atmospheric rivers contribute significantly to California's precipitation, snowpack, and major floods. They're predictable and can be forecasted up to a week in advance.
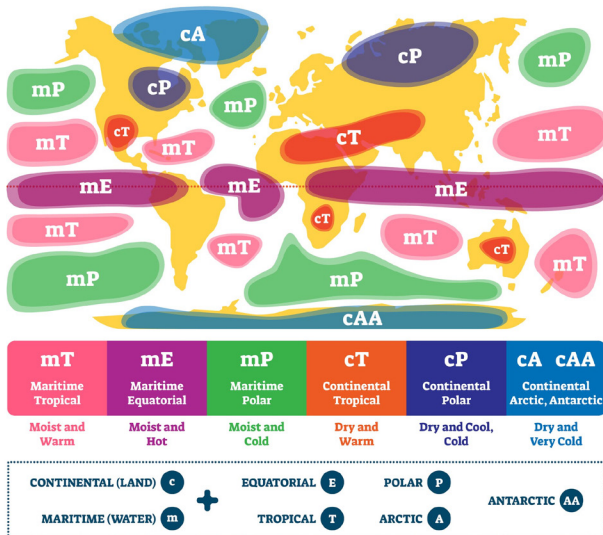
What is Air Mass?

> **About:**
>   ○ An air mass is **a large body of air with relatively uniform temperature**, humidity, and pressure characteristics. These masses of air form over source regions, where they take on the characteristics of the surface below due to low wind speeds.
>   ○ When air masses move, they can i**nfluence weather patterns in the region**s they move into, potentially leading to the formation of storms when they interact with other air masses.

Note:

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➢ **Types of Air Masses:**

○ **Continental Tropical (cT):** These air masses originate over hot and dry continental regions. They are characterized by h**igh temperatures and low humidity.**

○ **Continental Polar (cP):** Originating **over cold and dry continenta**l regions, cP air masses are ch**aracterized by cold temperatures** and low humidity.

○ **Maritime Tropical (mT)**: These air masses form over **warm and moist oceanic regions.** They are characterized by warm temperatures and high humidity.

○ **Maritime Polar (mP):** Originating over cold oceanic regions, mP air masses are characterized by cool temperatures and high humidity.

○ **Continental Arctic (cA):** cA air masses originate over extremely cold Arctic regions. They are characterized by frigid temperatures and very low humidity.

TYPES OF AIR MASSES

mT	mE	mP	cT	cP	cA cAA
Maritime Tropical	Maritime Equatorial	Maritime Polar	Continental Tropical	Continental Polar	Continental Arctic, Antarctic
Moist and Warm	Moist and Hot	Moist and Cold	Dry and Warm	Dry and Cool, Cold	Dry and Very Cold

CONTINENTAL (LAND) C	EQUATORIAL E	POLAR P	
MARITIME (WATER) m	TROPICAL T	ARCTIC A	ANTARCTIC AA

➢ **Characteristics of Air Masses:**

○ Air masses originate over vast flat surfaces having uniform temperature and humidity.

○ Air masses travel slowly over hundreds of kilometers from their source regions.

○ As the air masses move away from source regions their chief characteristics of temperature and humidity undergo large-scale changes.

○ They affect the weather conditions of the areas visited by them.

○ When two air masses of different temperature and humidity approach each other, they do not intermingle but **a front is formed** between them.

● Weather conditions change abruptly at the front.

● The front keeps two approaching air masses separate from each other.

Hindu Kush Himalayas

Why in News?

The **International Centre for Integrated Mountain Development (ICIMOD)** has issued a warning, calling for "**bold action**" and "**urgent finance**" to prevent the collapse of nature in High Mountain Asia.

➢ It stated that the **Hindu Kush Himalaya (HKH)**, one of the most biodiverse regions on Earth, is a '**biosphere on the brink'.**

What is the Hindu Kush Himalaya?

➢ **About**: Stretching over **3500 kilometres** and across eight countries: **Afghanistan, Bangladesh, Bhutan, China, India, Nepal, Myanmar and Pakistan**, HKH is one of the largest volumes of ice and snow outside of the Arctic and Antarctica.

○ **4 of the world's 36 global biodiversity hotspots** are in this region.

● Himalaya, Indo-Burma, Mountains of Southwest China, and Mountains of Central Asia

➢ **Water Tower of Asia:** It is called the **'Water Tower of Asia'**. At least 12 rivers fan out in every direction across the Asian continent from HKH:

○ The **Indus, Ganga and Brahmaputra** towards the **Arabian Sea** and **Bay of Bengal**

○ **Syr Darya and Amu Darya** towards the now-dead **Aral Sea**

○ The **Tarim** toward the Taklamakan

○ The Yellow river towards the Gulf of Bohai

○ The Yangtze towards the East China Sea

○ The Mekong towards the South China Sea

○ The Chindwin, Salween and Irrawaddy towards the Andaman Sea

➢ **Concern**:

○ **Escalating Climate Threat**: The rate of warming in the HKH region is estimated to be nearly **double the average rate** observed across the Northern Hemisphere.

Note:

❍ **Ecosystem Degradation**: Reports indicate that 70- 80% of the region's original habitat has already been lost, and that loss may increase to 80–87% by 2100.

❍ **Human Vulnerability:** Approximately 241 million individuals reside in the HKH region, with a significant portion facing **food insecurity and malnutrition.**

Note: High Mountain Asia comprises mountain ranges such as the Tian Shan, Kunlun Shan, Pamir, Karakoram, Hindu Kush, Tibetan Plateau and the Himalayas.

What is the International Centre for Integrated Mountain Development?

➢ **About**: ICIMOD is a regional intergovernmental organisation established in **1983** and working towards a **greener, more inclusive, and climate resilient Hindu Kush Himalaya.**

Regional member countries

| AFGHANISTAN | BANGLADESH | BHUTAN | CHINA | INDIA | MYANMAR | NEPAL | PAKISTAN |

Ethics

Highlights

- *First Human Neuralink Implant*

First Human Neuralink Implant

Why in News?

Recently, **Elon Musk** made a recent announcement concerning the **successful implantation of a Neuralink device** in a human subject.

➢ The device is roughly the size of a large coin, specifically designed for implantation in the **skull for brain-computer interface.**

➢ Neuralink has obtained approval from the **US Food and Drug Administration (FDA)** under the **"investigational device exemption**."

What is the Brain-Computer Interface?
➢ A Brain-Computer Interface (BCI) is a technology that **enables direct communication between the brain and external devices, such as computers or prosthetics,** without using traditional neuromuscular pathways like nerves and muscles. ➢ BCIs typically involve the use of sensors to detect brain activity, which is then translated into **commands or actions,** allowing individuals to control devices or interact with the external world **using their thoughts.**

What are the Potential Applications of Brain-Computer Interface?

➢ **Medical Treatments:**
- ○ **Neurological Disorders**: Monitoring and treating conditions like **epilepsy, Parkinson's disease,** and **neurodegenerative disorders** by directly interfacing with the brain.
- ○ **Stroke Rehabilitation:** Assisting in **motor function recovery** and rehabilitation after a stroke.

➢ **Assistive Tsechnology**: Enabling individuals with paralysis or motor impairments to control devices, such as **prosthetics, wheelchairs, or robotic limbs**, using their thoughts.
- ○ Restoring communication for individuals with conditions like **locked-in syndrome** (paralyzed except for the muscles that control eye movement).

➢ **Mental Health Monitoring**: Providing real-time data for monitoring and managing mental health conditions, such as **depression or anxiety.**

➢ **Virtual and Augmented Reality Interaction**: Enhancing virtual and augmented reality experiences by allowing users to interact with digital environments using their thoughts.

What are the Ethical Considerations Related to Brain-Computer Interface (BCI)?

➢ **Privacy Concerns:** BCIs can potentially decode thoughts and emotions. Unauthorised access to this information raises **concerns about cognitive privacy.**
- ○ As with any technology that involves the collection and storage of sensitive data, there are **risks of hacking and unauthorised access to the brain data**, which could lead to identity theft or other malicious uses.

➢ **Neurosecurity:** There is a risk that BCIs could be manipulated to unauthorised control or manipulation of a person's thoughts or actions.

➢ **Equity and Accessibility:** Critics argue that BCIs could exacerbate existing social inequalities if only specific socioeconomic groups can afford the technology due to its high cost and may lead to a situation of "**cognitive divide.**"

➢ **Medical and Therapeutic Applications:** Distinguishing between **therapeutic uses of BCIs and threats** to normal cognitive function is subjective.

Miscellaneous

Highlights

- *Bharat Ratna Awardees 2024*
- *Kyasanur Forest Disease*
- *Grammy Award 2024*

MANKOMBU SAMBASIVAN SWAMINATHAN (7 AUGUST 1925 – 28 SEPTEMBER 2023)

> *If God appears to poor and hungry in the form of bread as said by Mahatma Gandhi, that God is Dr. Swaminathan who should be worshipped by every citizen while taking daily meals.*

Famously called

- Father of Green Revolution in India
- Father of Economic Ecology by UNEP

Timeline

- **1947-49:** After Independence, joined IARI, New Delhi
- **1949-54:** UNESCO Fellowship, Doctorate, and Postdoctoral
- **1965-70:** Led Green Revolution in India (with Norman Borlaug)
- **1972-88:** Headed ICAR, Revolutionised Rice research across Asia as DG-IRRI (First Asian)
- **1987-89:** Estd M.S Swaminathan Research Institute, Chennai
- **1990-02:** President of the Pugwash Conferences on Science and World (2002-07)
- **2004-13:** Chaired National Commission on Farmers
- **2013-23:** Steered M S Swaminathan Research Foundation (MSSRF) on sustainable agriculture, nutrition, security, etc.

Major Awards

- Padma Shri, 1967
- Ramon Magsaysay Award for Community Leadership, 1971
- Padma Bhushan, 1972
- Won inaugural World Food Prize, 1987
- Padma Vibhushan, 1989
- Mahatma Gandhi Prize of UNESCO, 2000
- Bharat Ratna, 2024 (Posthumously)

MS Swaminathan was included in List of 20 most Influential Asians of 20th century by TIMES Magazine

Drishti IAS

Note:

Bharat Ratna Awardees 2024

Why in News?

The prestigious **Bharat Ratna,** India's highest civilian **honour,** is set to be conferred upon five eminent personalities who have made remarkable contributions to politics, governance, and agriculture. They are **Karpoori Thakur, Mankombu Sambasivan (MS) Swaminathan, Pamulaparthi Venkata (P. V.) Narasimha Rao, Lal Krishna Advani**, and Chaudhary Charan Singh.

## What are the Notable Contributions of Bharat Ratna Awardees (2024)?

➢ **Karpoori Thakur:**

○ Karpoori Thakur, known as **"Jan Nayak,"** served as Bihar's 11th Chief Minister **twice, from 1970-71 and 1977-79.** He will be conferred the Bharat Ratna posthumously.

○ Karpoori Thakur was the pioneer in providing the **Other Backward Classes (OBCs)** with the benefit of reservation as he implemented the recommendations of the **Mungeri Lal Commission** during his tenure as Bihar CM from 1977 to 1979.

○ In 1978, he introduced a groundbreaking reservation model, allocating **26% of reservations with specific quotas for OBCs, Economically Backward Classes (EBCs), women**, and economically backward classes among upper castes.

○ Thakur advocated for marginalised communities' rights, emphasising social justice and inclusive development.

➢ **Mankombu Sambasivan (MS) Swaminathan:**

○ MS Swaminathan, the **'Father of India's Green Revolution,'** helped India become self-reliant in agriculture and modernised it. He will be conferred the **Bharat Ratna posthumously.**

○ Developed **high-yielding wheat and rice varieties** with Norman Borlaug, revolutionising agriculture in India in the 1960s and '70s.

○ He Advocated for fair prices for agricultural produce and sustainable farming practices, leading the **National Commission of Farmers.**

○ He played a pivotal role in developing the **Protection of Plant Varieties and Farmers' Right Act, 2001**.

○ Swaminathan received numerous prestigious awards, including the **Shanti Swarup Bhatnagar Award** in 1961, the **Ramon Magsaysay Award in 1971**, and the **Albert Einstein World Science Award in 1986.**

● Recognised with the **Padma Shri (1967), Padma Bhushan (1972) Padma Vibhushan (1989)**.
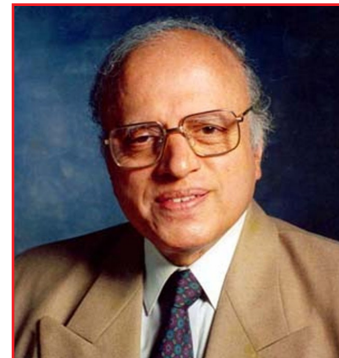

➢ **Pamulaparthi Venkata (P. V.) Narasimha Rao:**

○ P. V. Narasimha Rao served as the 9th Prime Minister of India from 1991 to 1996, he will be **conferred the Bharat Ratna posthumously.**

○ As Prime Minister, P.V. Narasimha Rao reset **India's foreign policy,** improving ties with the **United States** and establishing relations with **Israel.**

○ He maintained national independence by refusing to give up **India's right to pursue its nuclear strategy.**

○ Rao's tenure left behind a polity more confident, with India on a path of economic **liberalization** and resurgence, following the **LPG reforms of 1991** that opened up the economy to globalisation, reduced trade barriers, and initiated privatisation in various sectors.

○ He published **'SahasraPhan',** a Hindi translation of the famous Telugu Novel **'Veyi Padagalu'.**

○ The **73rd and 74th Constitutional Amendments Acts** were enacted during the tenure of P.V. Narasimha Rao.

● The 73rd and 74th Amendment Acts mandate the reservation of one-third of seats for women in **Panchayati Raj institutions** and **urban local bodies (ULBs).**
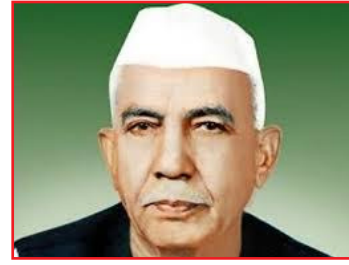
Note:

➢ **Lal Krishna Advani:**

○ Advani through the years has served as the 7th Deputy Prime Minister of India (1999-2004) and as the **President of the Bharatiya Janata Party** for the longest period since its inception in 1980.

○ Advani is widely regarded as an individual of great intellectual ability, strong principles, and unwavering support for the idea of a strong and prosperous India.
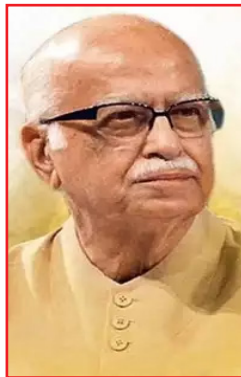
➢ **Chaudhary Charan Singh:**

○ Chaudhary Charan Singh was an Indian politician and a freedom fighter. He served as the **5th prime minister of India** and former **Chief Minister of Uttar Pradesh.**

● In 1952, as agriculture minister, he led Uttar Pradesh in abolishing the **zamindari system.**

○ He advocated for the **interests and rights of the peasants** and introduced several measures to improve their conditions and welfare. He also promoted the values of **democracy, secularism, and social justice.**

○ Charan Singh followed **Mahatma Gandhi** in a **non-violent struggle** for independence from the British Government and was imprisoned several times.

Note: The **rule of maximum three awards in a year** is a **guideline for the Bharat Ratna.** The rule was **broken for the first time in 1999,** when four recipients were conferred the award: **Jayaprakash Narayan**, **Amartya Sen, Gopinath Bordoloi, and Ravi Shankar.**

○ The rule was broken again in 2024, when **five recipients were conferred the award.**

Kyasanur Forest Disease

Why in News?

Since the beginning of 2024, two individuals have lost their lives due to **Kyasanur Forest Disease (KFD),** a viral infection prevalent in Karnataka.

➢ The number of deaths reported due to the disease since 1956, when it was noticed in the forests of **Shivamogga district**, is above 560.

What is Kyasanur Forest Disease (KFD)?

➢ **About:**

○ Kyasanur Forest Disease (KFD), a **zoonotic illness,** is colloquially referred to as "monkey disease" due to its link with monkey fatalities.

○ It is caused by the **Kyasanur Forest disease Virus (KFDV)**, which primarily affects **humans and monkeys.**

● It was first identified in **1957** in a sick monkey from the Kyasanur Forest in Karnataka. Since then, between 400-500 human cases per year have been reported.

● Eventually, KFD emerged as a **grave public health problem** spreading through the entire **Western Ghats**.

➢ **Transmission:**

○ In nature, the **virus** is maintained mainly in **hard ticks (Haemaphysalis spinigera)**, monkeys, rodents, and birds.

○ To humans, it may occur after a **tick bite** or contact with an infected animal (a sick or recently dead monkey).

Note:

➢ **Occurrence:**
  ○ Normally, the transmission **begins** from late November to June and peaks between December and March.
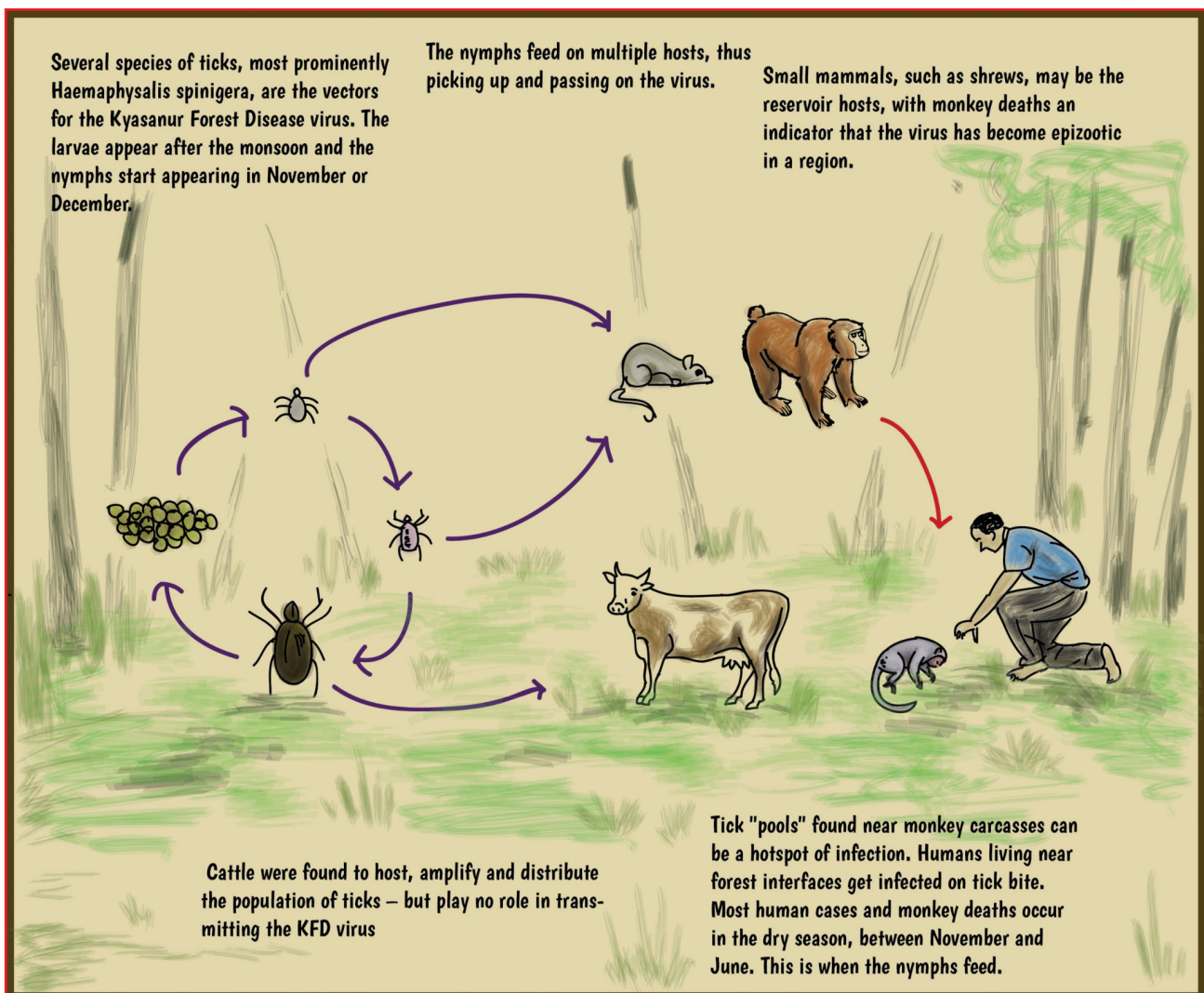
➢ **Symptoms:**
  ○ Characterised by **chills, frontal headache,** body ache, and high fever for five to 12 days with a case fatality rate of **3 to 5%.**

➢ **Diagnosis:**
  ○ Diagnosis can be made in the **early stage** of illness by molecular detection by **polymerase chain reaction(PCR)** or virus isolation from blood.
  ○ Later, serologic testing using Enzyme-linked Immunosorbent Serologic Assay **(ELISA)** can be performed.

➢ **Treatment and Prevention:**
  ○ Doctors manage symptoms and monitor vitals daily, in the absence of any specific treatment.
    ● Patients are receiving **free treatment** as per the State Government's decision.
  ○ A vaccine (Formalin inactivated **KFDV vaccine**) does exist for KFD and is used in endemic areas of India.
    ● However, the Indian Council of Medical Research **(ICMR)** is said to be in consultation with Indian Immunologicals for the development of a vaccine.
  ○ The forest department is distributing (N, N-diethyl phenylacetamide) **DEPA oil**, to be applied to exposed skin which acts as a **tick repellent.**

Several species of ticks, most prominently Haemaphysalis spinigera, are the vectors for the Kyasanur Forest Disease virus. The larvae appear after the monsoon and the nymphs start appearing in November or December.

The nymphs feed on multiple hosts, thus picking up and passing on the virus.

Small mammals, such as shrews, may be the reservoir hosts, with monkey deaths an indicator that the virus has become epizootic in a region.

Cattle were found to host, amplify and distribute the population of ticks — but play no role in transmitting the KFD virus

Tick "pools" found near monkey carcasses can be a hotspot of infection. Humans living near forest interfaces get infected on tick bite. Most human cases and monkey deaths occur in the dry season, between November and June. This is when the nymphs feed.

Note:

Kyasanur Forest
➢ The Kyasanur Forest is a protected area located in the Shimoga district of Karnataka.   ➢ It is part of the **Western Ghats** mountain range and is known for its rich biodiversity.   ➢ The forest is home to a variety of plants and animals, including tigers, leopards, elephants, and gaur.

Grammy Award 2024

Why in News?

Shakti, a fusion music group comprising tabla maestro **Zakir Hussain** and singer **Shankar Mahadevan**, has won the **66th Grammy Award** (2024) for **Best Global Music Album** for **"This Moment"**.

➢ Shakti's third studio album, **"This Moment,"** was released on 23rd June 2023, marking their return after 46 years under the same name.

What are Grammy Awards?

➢ **About:**
  ○ **Grammy Award** (originally named **Gramophone Award**) is a series of awards presented annually in the **United States (US)** by the **National Academy of Recording Arts & Sciences (NARAS)** or the Latin Academy of Recording Arts & Sciences (LARAS), (LARAS only for recordings in Spanish/Portuguese languages).
  - This annual event to recognize musical achievements was started in 1959 to respect the performers for the year 1958. The **honorees receive a golden statuette of a gramophone.**

➢ **India's Performance in 2024 Awards:**
  ○ **Shakti, comprising Zakir Hussain,** Shankar Mahadevan, John McLaughlin, Ganesh Rajagopalan, and Selvaganesh Vinayakram, **won the 2024 Grammy for their album "This Moment."**
    - Described as an "unprecedented transcontinental collaboration," Shakti brings together musicians from **both Eastern and Western traditions**, pioneering the blueprint for what is now recognized as world music.
  ○ **Zakir Hussain** clinches an additional pair of victories, **securing two more Grammys** at the ceremony.
    - He earned one for the **best global music performance with 'Pashto'** and another for the **best contemporary instrumental album 'As We Speak,'**.
    - The album also features Indian flute player **Rakesh Chaurasia,** the nephew of the renowned flautist **Hariprasad Chaurasia.**

Note:

Rapid Fire Current Affairs

Highlights

- SC Strikes Down Electoral Bonds Scheme
- Gold ETF Inflows Surge Amidst Economic Uncertainty
- General Bipin Rawat
- Indo-Dutch Collaboration for Energy Transition
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- Use of Nitrogen Gas for Capital Punishment
- Jasprit Bumrah Tops ICC Men's Test Bowling Rankings
- Kufos Joins NISAR Phase II Project
- EU Sets New Climate Goal for 2040
- GRAPES-3 Experiment
- Maa Kamakhya Divya Pariyojana
- UPI Goes Global from Eiffel Tower
- CLEA - Commonwealth Attorneys and Solicitors General Conference 2024
- Manatee Gathering at Florida Park
- Ancient Subika Painting
- Child Safety Portals
- Assam's Traditional Buffalo and Bulbul Fights
- Vyommitra
- India Energy Week 2024
- NCGG Empowers African Civil Servants
- Bharat Ratna to LK Advani
- NITISH Device
- Exercise Vayu Shakti- 2024
- Kalaripayattu
- Dusted Apollo Butterfly
- Sandhayak
- Digital Detox Initiative for Responsible Tech Use
- The Marvel of E Ink Displays
- C-CARES Web Portal
- MQ-9B Sky Guardian
- Indian Gray Wolf
- Trans Fatty Acids (TFAs)
- High-Velocity Air Fuel Spraying
- Raising Day of ICG
- D.K. Basu Case 165
- Auroville Exposure Tour
- India's Core Industries Performance

SC Strikes Down Electoral Bonds Scheme

Recently, the **Supreme Court(SC)** struck down the **electoral bonds** scheme that allows anonymous donations to political parties, citing it as unconstitutional.

➢ SC asserted that transparency regarding funding to political parties is crucial for informed electoral decisions, affirming that the scheme infringes upon the right to information as enshrined in **Article 19(1)(a)**.

➢ Electoral bonds are money instruments that act as **promissory notes** or **bearer bonds** that can be purchased by individuals or companies in India.

  ❍ They are issued specifically for the contribution of funds to the political parties.

  ❍ The **SBI is the only bank authorized to issue and encash electoral bonds.**

Note:

○ The donations made under this scheme **enjoyed 100% tax exemption.**

➢ SC has directed the **State Bank of India** to stop issuing electoral bonds immediately and submit all the details to the **Election Commission** by **6th March, 2024.**

Read more: Electoral Bonds

Gold ETF Inflows Surge Amidst Economic Uncertainty

In January 2024, **Gold Exchange Traded Funds (ETFs)** witnessed a remarkable surge in inflows, reaching **Rs 657 crore.** This influx contributed to a **1.6% rise in the assets under management (AUM) of gold funds**.

➢ Experts attribute this surge to the enduring appeal of gold as a **safe haven and hedge against inflation,** particularly amidst ongoing geo-political tensions and elevated inflation in the US.

➢ Gold ETFs are **passive investment instruments** representing physical gold which may be in paper or dematerialised form. Each unit of a Gold ETF usually represents a fixed **amount of gold, often 1 gram.**

○ Gold ETFs combine the flexibility of stock investment and the simplicity of gold investments.

➢ Investing in Gold ETFs entails acquiring gold in an **electronic format,** allowing individuals to engage in buying and selling activities just like stock trading.

○ They offer liquidity and exposure to gold prices without the hassle of owning and storing physical gold.

Read more: Gold Exchange Traded Funds

General Bipin Rawat

Recently, the Minister of Defence of India unveiled a life-size statue of the **late General Bipin Rawat (1958-2021),** the **country's first Chief of Defence Staff (CDS),** at TonsBridge School, Dehradun, Uttarakhand.

➢ Bipin Rawat was born in Pauri, Uttarakhand on 16th March 1958. He is an alumnus of the **National Defence Academy (NDA)** and the **Indian Military Academy (IMA).**

➢ **Military Career Highlights:**

○ Served in various capacities including General Officer Commanding-in-Chief (GOC-C) Southern Command, and General Staff Officer Grade 2 at the Military Operations Directorate.

○ Commanded a multinational brigade in the **Democratic Republic of Congo** as part of the **United Nations Peacekeeping Force.**

○ Became Vice-Chief of Army Staff before assuming the role of Chief of Army Staff (COAS).

➢ **Key Achievements:**

○ Played a significant role in reducing militancy in the Northeast.

○ Instrumental in planning the **2016 surgical strikes** across the **Line of Control into Pakistan-occupied Kashmir,** which was a response to terrorist activities.

➢ **Decorations and Awards:**

○ During his service, he was decorated with the **Param Vishisht Seva Medal, Uttam Yudh Seva Medal, Ati Vishisht Seva Medal, Vishisht Seva Medal, Yudh Seva Medal, and Sena Medal.**

Read more: Role of the Chief of Defence Staff, Theaterisation-of-Armed-Forces

Indo-Dutch Collaboration for Energy Transition

Recently, **NITI Aayog** and the Embassy of the Kingdom of the Netherlands released a report titled **'LNG as a Transportation Fuel in Medium and Heavy Commercial Vehicle'** during **India Energy Week.**

➢ It addresses the potential of LNG as a fuel source and suggests strategies for its utilisation in **commercial vehicles.**

➢ LNG is natural gas that has been converted to a liquid form for the ease and safety of natural gas transport.

○ **Natural gas** is cooled to approximately **-260°F,** creating a clear, colourless, and non-toxic liquid that can be transported from areas with a large supply of natural gas to areas that demand more natural gas.

Read more: Natural Gas: A Stepping Stone

Note:

National Film Awards

The **National Film Awards**, a prestigious recognition in Indian cinema, have undergone significant changes as per the recommendations of a committee set up by the Information and Broadcasting Ministry. These changes, aimed at rationalizing categories and increasing cash rewards, mark a departure from traditional nomenclature and category distinctions. The new names are more descriptive of the award criteria.

➢ **Renaming Awards:**

➢ The **'Indira Gandhi Award for Best Debut Film of a Director'** is now **'Best Debut Film of a Director'**.

➢ The **'Nargis Dutt Award for Best Feature Film on National Integration'** is renamed **'Best Feature Film Promoting National, social and Environmental Values'.**

➢ **Monetary Rewards:**

   ○ The **Dadasaheb Phalke Award's** prize money has been raised from Rs 10 lakh to Rs 15 lakh.

   ○ **Swarna Kamal (Golden Lotus) awardees** will now receive Rs 3 lakh, and **Rajat Kamal (Silver Lotus)** winners Rs 2 lakh, across categories.

     ● Swarn Kamal is given in these categories: best film, debut film, film providing wholesome entertainment, direction and children's film.

     ● Rajat Kamal is given to winners of best feature film promoting national, social and environmental values, all the acting categories, best screenplay, music and other such categories.

➢ **Category Modifications:**

   ○ Awards for 'best animation film' and 'best special effects' have been combined into a new category called **"best AVGC film".**

   ○ 'Best Audiography' is now 'best sound design', with a prize money increase to Rs 2 lakh.

➢ **Continuation of Jury Discretion:**

   ○ Special mentions in feature and non-feature film categories remain at the jury's discretion.

   ○ Special jury award **discontinued**, replaced by discretionary special mentions.

   Read more: Dadasaheb Phalke Award

Global Biodiversity Framework Fund

The first council meeting of the **Global Biodiversity Framework Fund (GBFF)** took place recently in Washington DC, US.

➢ The meeting, held as part of the **66th Council Meeting of the Global Environment Facility (GEF),** underscored the necessity of securing funds to fulfil the objectives outlined in the **Kunming-Montreal Global Biodiversity Framework** adopted at COP15.

   ○ Guidelines were established for the execution of GBFF, initially proposed during **COP15 of the Convention on Biological Diversity (CBD)** in 2022.

➢ GEF, as the implementing agency for GBFF, serves as a **"financial mechanism"** to five conventions: CBD, **UNFCCC, Stockholm Convention on Persistent Organic Pollutants, UN Convention to Combat Desertification,** and **Minamata Convention on Mercury**.

   Read more: Global Environment Facility, Kunming-Montreal Global Biodiversity Framework, Convention on Biological Diversity

Odisha Government's SWAYAM and KHUSI Schemes

The Odisha government has recently announced a one-time livelihood cash assistance of ₹1,000 for the families covered by the **Public Distribution System (PDS)** in the state.

➢ A new scheme called **'Swayam'** was launched to provide interest-free bank loans of ₹1 lakh to rural unemployed youths aged 18-35 (18-40 for special category) to initiate new business ventures.

   ○ At national level, **Pradhan Mantri MUDRA Yojana (PMMY)** was launched in April, 2015 for providing loans up to 10 lakh to the **non-corporate, non-farm small/micro enterprises.**

➢ The government expanded the existing **KHUSI scheme, now called KHUSI+**, to distribute **belted sanitary napkins** for institutional deliveries and medical termination of pregnancy in government facilities, aiming to improve menstrual hygiene awareness and reduce maternal mortality and morbidity rates in the state.

Note:

❍ Odisha boasts a high rate of 81.5% of women using hygienic menstrual protection, exceeding the national average, as per the **National Family Health Survey 5.**

Read more: National Family Health Survey 5, Public Distribution System (PDS)

Smart Food Grain Storage System (SAFEETY) technology

Recently, the Ministry of Electronics and Information Technology (MeitY) has successfully transferred the **Smart Food Grain Storage System (SAFEETY) technology** to **M/s Paras Defense and Space Technology Ltd.** This is a step towards fostering innovation and advancing technology in the country.

➢ SAFEETY, developed by the **Society for Applied Microwave Electronics Engineering and Research (SAMEER)** an autonomous R&D institution under MeitY, boasts cutting-edge features such as **conveyorized**

loading and unloading of grain bags with **Radio Frequency Identification (RFID)** for traceability, online weight and moisture measurement, and Radio Frequency Based **Removal of Moisture from Grain**.

❍ The system can handle almost one truckload (approx. weight: 28 tons) of grains in 40 minutes.

➢ The technology transfer of SAFEETY is a step towards the Innovation, Science and Technology theme of **Vikshit Bharat @2047**, which aims to make India a global leader in digital transformation and innovation.

➢ The technology will help in reducing **post-harvest losses**, improving **food quality** and safety, and enhancing **food security** in the country.

Read more: Digital Agriculture

Brumation a Survival Strategy in Reptiles

Recently, researchers have shed light on a survival strategy employed by **reptiles** known as brumation.

HIBERNATION

Hibernation is a state of inactivity and decreased metabolism in some endotherms*, such as bears. Hibernation usually takes place during extreme cold temperatures when the body decreases body temperature and slows heart rate and breathing to conserve energy.

*Endotherms (warm-blooded) regulate body temperature internally. Humans are endothermic.

AESTIVATION

Aestivation refers to a state of inactivity in ectotherms* that occurs during extreme warm temperatures. Box turtles will aestivate in shallow forms, or depressions, in the soil. This allows them to stay moist and cool.

*Ectotherms (cold-blooded) depend on external sources to regulate body temperature. All reptiles are ectotherms.

BRUMATION

Brumation is a hibernation-like phase of inactivity in ectotherms during extreme cold temperatures. Box turtles will burry themselves in leaves or soil to keep warm during cold winter months. Depending on the extremity of the temperatures, a box turtle may burry itself fully or just partially.

➢ Brumation refers to a **state of dormancy or reduced activity** in reptiles, **akin to hibernation in mammals**, typically occurring in **colder months** with limited food availability and is a natural part of their cycle.

❍ Reptiles are **cold-blooded vertebrates.** (Vertebrates have backbones.) They have dry skin covered with **scales or bony plates** and usually lay soft-shelled eggs.

Note:

➢ Reptiles enter brumation to **conserve energy and endure harsh conditions** when temperatures drop and food becomes scarce, allowing them to **survive** until they can **reemerge for feeding and reproduction** in favourable environments.

➢ Reptiles retreat to sheltered areas like **burrows or rock crevices**, slowing metabolism to endure extended periods without eating.

➢ Researchers have documented instances of brumation in various reptilian species, including **turtles, snakes, and lizards**, each exhibiting unique behaviours to cope with adverse conditions.

Read more: World's Smallest Reptile

Maiden India-Saudi Arabia Army Exercise

Recently, the **maiden joint military exercise 'Sada Tanseeq'** between the Indian Army and the Royal Saudi Land Force concluded at Mahajan Field Firing Ranges.

➢ It was a 12-day joint exercise that aimed to achieve interoperability between the two forces and acquaint each other with operational procedures and combat drills under **United Nations (UN)** mandate.

○ Both the contingents jointly took part in the validation phase which included creation of **Temporary Operating Base,** establishing an intelligence, surveillance and reconnaissance grid and establishing mobile vehicle check post.

➢ Another joint exercise between India and Saudi Arabia is **Al-Mohed Al-Hindi Exercise** (naval).

Joint Military Exercises of India with Other Countries	
Name of Exercise	**Country**
Garuda Shakti	Indonesia
Ekuverin	Maldives
Hand-in-Hand	China
Kurukshetra	Singapore
Mitra Shakti	Sri Lanka
Nomadic Elephant	Mongolia
Shakti	France
Surya Kiran	Nepal
Yudh Abhyas	USA

Read More: India-Saudi Arabia Relations

Note:

200ᵗʰ Jayanti Celebrations of Swami Dayanand Saraswati

Recently, the Prime Minister of India addressed a programme on the **200ᵗʰ birth anniversary** of **Swami Dayananda Saraswati.**

➢ Swami Dayanand Saraswati was born as Mool Shankar Tiwari on **12th February 1824** in **Tankara, Gujarat.**

➢ He wandered as an ascetic for **fifteen years (1845-60)** in search of truth.

　○ The **DAV (Dayanand Anglo Vedic) schools** came into existence in **1886** to realise the vision of **Swami Dayanand Saraswati.**

➢ The first **Arya Samaj Unit** was formally set up by **Swami Dayanand Saraswati** at Mumbai in **1875** and later the headquarters of the **Samaj** were established at **Lahore.**

➢ He took inspiration from the **Vedas** and considered them to be **'India's Rock of Ages',** the infallible and the true original seed of **Hinduism.**

　○ He gave the slogan **"Back to the Vedas".**

　Read More: Swami Dayanand Saraswati

Focus on Inflation Control

The **RBI's Monetary Policy Committee (MPC)** maintains its focus on **curbing inflation** by keeping the **repo rate unchanged at 6.5%** in February 2024 to align **inflation with the 4% target.**

➢ The MPC aims to achieve a **medium-term target of 4% inflation within a band of +/- 2%.**

➢ The MPC aims to **withdraw accommodation** gradually to align inflation with the target while supporting growth.

　○ An **accommodative stance** means the central bank is prepared to expand the **money supply to boost economic growth.**

　○ Withdrawal of accommodation will mean **reducing the money supply in the system** which will rein in inflation further.

➢ A recent RBI Bulletin states that **Headline inflation** rose to 5.7% in December 2023, primarily driven by **food inflation,** emphasising the need for continued vigilance.

➢ The MPC determines the **policy interest rate required to achieve the inflation target.** The RBI controls **inflation and deflation** by employing a variety of **monetary policy tools** such as:

　○ Repo rate, **Reverse repo rate**, **Bank rate, Open market operations, Statutory liquidity ratio (SLR), Cash reserve ratio (CRR), Liquidity adjustment facility (LAF), and Market stabilization scheme.**

Note:

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QUANTITATIVE INSTRUMENTS OF MONETARY POLICY

LIQUIDITY ADJUSTMENT FACILITY (LAF)

- **Repo Rate (RR):** The rate at which the RBI lends money to commercial banks. Here, RBI purchases securities.

- **Reverse Repo Rate:** The rate at which the RBI borrows money from commercial banks within the country. Opposite of Repo.

- If RBI wants to signal tight monetary policy, it will increase the repo rate; banks will increase their lending rates.

BANK RATE

- It is a long-term rate (RR is short-term) at which the central bank lends money to other banks.

- Increase in Bank rate will increase the interest rates on the Loans /Deposits and vice versa.

STATUTORY LIQUIDITY RATIO (SLR)

- SLR is the minimum percentage of deposits that a commercial bank has to maintain in the form of liquid cash, gold or other securities.

- If RBI wants to tighten the monetary policy, it will raise the SLR.

CASH RESERVE RATIO (CRR)

- Banks are required to hold a certain proportion of their deposits in the form of cash with RBI.

- With the increase in CRR, banks increase the lending rates.

OPEN MARKET OPERATIONS (OMOS)

- These include purchase/sale of government securities by the Central Bank for injection/absorption of durable liquidity in the banking system.

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Read more: RBI Keeps Policy Rates Unchanged

Note:

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Extending the Ban on SIMI

The **Ministry of Home Affairs (MHA)** extended the ban on the **Students Islamic Movement of India (SIMI)** for five more years.

➢ MHA cited involvement in **terrorism**, disturbing peace, and threatening sovereignty as reasons for the ban extension.

➢ SIMI was labeled an **"unlawful association"** under the **Unlawful Activities Prevention Act (UAPA) in 2001**.
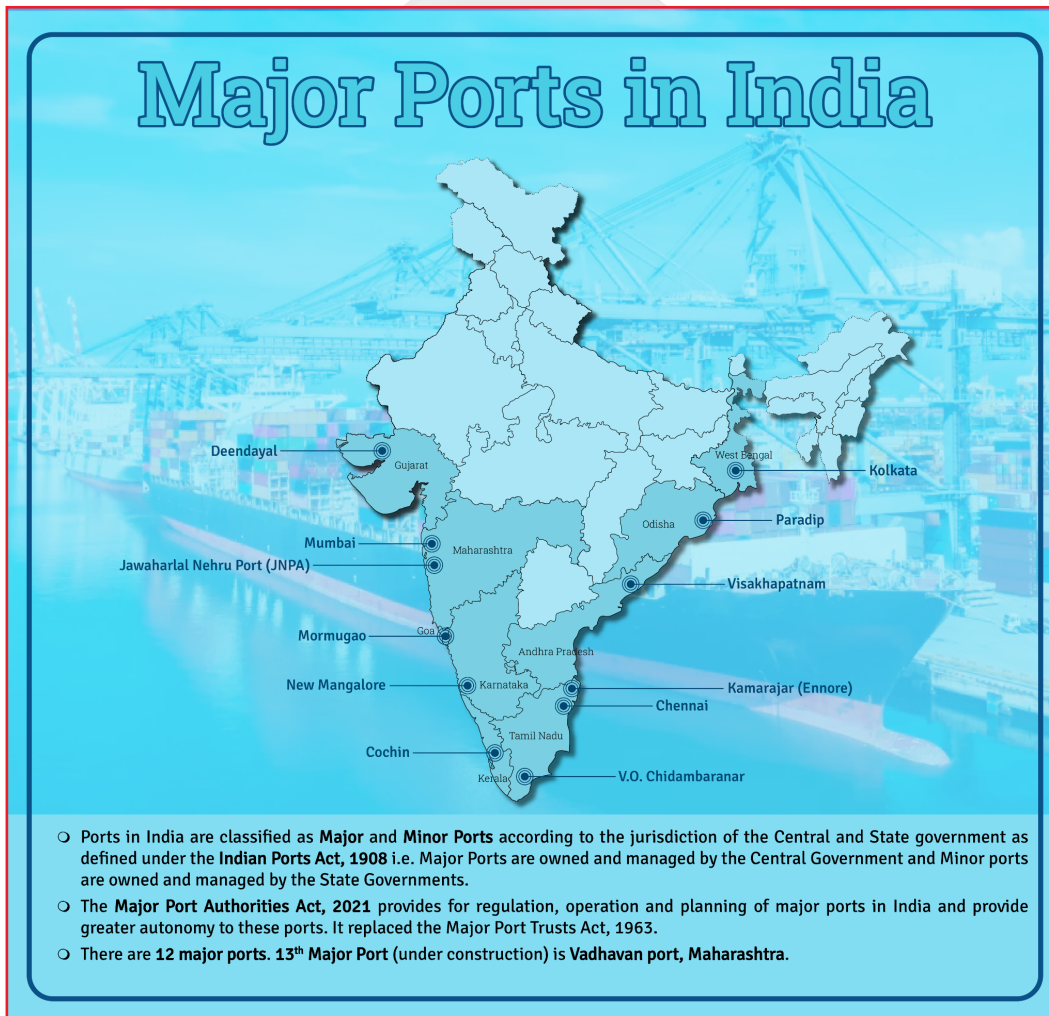
    Read more: Unlawful Activities (Prevention) Act

India to Develop Six Mega Ports by 2047

In a recent update by the **Ministry of Ports, Shipping and Waterways,** significant plans have been outlined for the **development of Mega Ports in India by 2047.**

➢ Six port clusters identified for development as Mega Ports by 2047.

    ○ Four port clusters with a capacity exceeding 300 Million Tonnes Per Annum (MTPA):

        ● Cochin –**Vizhinjam Port** cluster, **Galathea South Bay Port,** Chennai – Kamarajar– Cuddalore Port cluster, Paradip and Other Non-Major Ports Cluster.

    ○ **Two port clusters with Capacity Exceeding 500 MTPA:**

        ● (i) **Deendayal and Tuna Tekra** and (ii) **Jawaharlal Nehru – Vadhavan.**

➢ Major Ports are enhancing capacity and infrastructure as part of the **Maritime AmritKaal Vision, 2047**.

    ○ Infrastructure projects are underway via **Public-Private Partnership (PPP)** and internal resources, focusing on port development.

Major Ports in India

- Deendayal — Gujarat
- Kolkata — West Bengal
- Mumbai — Maharashtra
- Jawaharlal Nehru Port (JNPA)
- Paradip — Odisha
- Visakhapatnam
- Mormugao — Goa
- Andhra Pradesh
- New Mangalore — Karnataka
- Kamarajar (Ennore)
- Chennai
- Cochin — Kerala
- Tamil Nadu
- V.O. Chidambaranar

○ Ports in India are classified as **Major** and **Minor Ports** according to the jurisdiction of the Central and State government as defined under the **Indian Ports Act, 1908** i.e. Major Ports are owned and managed by the Central Government and Minor ports are owned and managed by the State Governments.

○ The **Major Port Authorities Act, 2021** provides for regulation, operation and planning of major ports in India and provide greater autonomy to these ports. It replaced the Major Port Trusts Act, 1963.

○ There are **12 major ports.** 13th Major Port (under construction) is **Vadhavan port, Maharashtra.**

Read more: Vizhinjam International Seaport Project

Note:

Digitalising Fair Price Shops in Himachal Pradesh

The **Department of Food and Public Distribution,** Government of India, launched a pilot program to onboard **Fair Price Shops (FPSs)** onto the **Open Network Digital Commerce (ONDC) platform** in Una and Hamirpur districts of Himachal Pradesh.

➢ It is the **first time** that Fair Price Shops are on-boarded on ONDC and aims at providing additional avenues of income generation for FPS dealers along with enhancing beneficiary satisfaction.

➢ **FPS** means a shop which has been licensed to distribute essential commodities to the ration card holders under the **Public Distribution System.**

  ❍ The term is defined in **Section 2(4) of National Food Security Act, 2013.**

  ❍ It offers daily food products like rice, oil, sugar, wheat, and other daily useful commodities at a much lower price than the market price.

➢ **ONDC** is a freely accessible government-backed platform that aims to **democratise e-commerce** by moving it from a platform-centric model to an open network for buying and selling of goods and services.

  ❍ It was launched by the **Department for Promotion of Industry and Internal Trade** (Ministry of Commerce and Industry) in 2021.

  Read more: Public Distribution System, ONDC

Freestyle Chess

Recently, **Chess World No 1 Magnus Carlsen** faced off against world champion Ding Liren across the chess board in a new, innovative tournament, called **Freestyle Chess.**

➢ More recently, **Grandmaster D Gukesh** of India defeated World No. 1 Magnus Carlsen of Norway, Levon Aronia of Armenia and ultimately the reigning world champion Ding Liren of China on the opening day of the Weissenhaus Chess Challenge.

➢ Freestyle chess goes by multiple names: **Fischer Random Chess, Chess 9LX, and Chess 960** where 960 is the number of possible starting positions on the board when you shuffle your pieces on the last ranks of the board.

❍ This form of chess **differs from the other forms is in the placement of the pieces on the board at the start of the game.** All the eight pawns of each colour remain in the second and the seventh ranks on the board like in regular chess.

❍ The position of the rest of the pieces - the rooks, the bishops, the knights, the queen, and the king -on the first and the last rank changes **randomly at the start of the game.**

  ● It must be noted that the pieces still retain their regular characteristics in action: rooks travel in straight lines, bishops saunter diagonally, and so on.

Read More: FIDE Grand Swiss Open 2023, Olympics

Birth Anniversary of Dr. Zakir Hussain
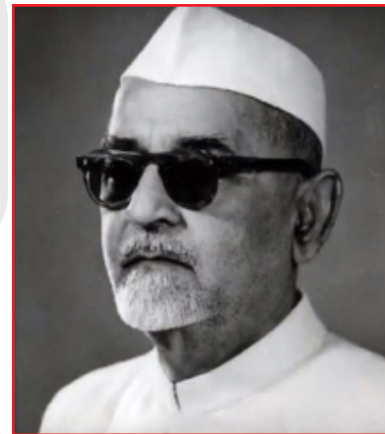
Recently, the President of India, paid floral tributes to **Dr. Zakir Hussain**, former President of India on his birth anniversary at Rashtrapati Bhavan.

➢ Dr. Zakir Husain (08 Feb 1897- 03 May 1969) was an Indian statesman, and the first Muslim to hold the position of **President of India in 1967.**

  ❍ He was also appointed **governor** of Bihar state in 1957 and was elected **vice-president** of India in 1962.

➢ He helped found the Muslim National University in Aligarh (later moved to New Delhi) and served as its vice-chancellor from 1926 to 1948.

  ❍ At **Mahatma Gandhi's** invitation, he also became chairman of the National Committee on Basic Education, established in 1937 to design a **Gandhian syllabus for schools.**

Note:

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➢ During 1956–58, he served on the executive board of the **United Nations Educational, Scientific, and Cultural Organization (UNESCO).**

  Read More: Parliament, United Nations

Olive Ridley Turtles on Mangaluru Beaches

After a gap of nearly 40 years, **Olive Ridley turtles** (*Lepidochelys olivacea*) returned to nest on the beaches of **Karnataka's Mangaluru** division in February 2024, overcoming **environmental challenges** such as increased salinity and pollution.

➢ Olive Ridley turtles, typically laying around 150 eggs per site, have pleasingly nested on **Sasihithlu and Tannerbavi** beaches.

➢ The Olive Ridley turtles, named for their **olive-coloured shell**, are the world's **smallest** and **most populous** sea turtles.

  ○ They are known for their **mass nesting practice called 'Arribada'.**

  ○ **Protection Status:**

   ● **IUCN-** Vulnerable

   ● **Wildlife Act of 1972- Schedule 1**

➢ They feed on **jellyfish**, play a role in controlling the jellyfish population.

Few Turtle Species

Loggerhead Sea Turtle
- Species of oceanic turtle
- Spend most of their life in saltwater and estuarine habitat
- IUCN status: **Vulnerable**

Leatherback Turtle
- The largest of the seven species of sea turtles
- Able to maintain high body temperature using metabolically generated heat
- IUCN status: **Critically Endangered**

Green Turtle
- Named after the greenish colour of their cartilage
- Found in tropical and subtropical waters
- IUCN Status: **Endangered**

Olive Ridley Turtle
- Smallest and most abundant of all sea turtles
- Carnivores
- They practice Unique Mass Nesting called Arribada
- IUCN Status: **Vulnerable**

#FewTurtleSpecies

Drishti IAS

Read more: Olive Riddley Turtle

Note:

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Zero Hour

During the ongoing **Budget session**, members of the Lok Sabha have raised key issues including **Manipur ethnic violence**, stricter **hate speech** laws, and a national task force for stray dogs during the **Zero Hour**.

➢ Zero hour commences directly after the **question hour** and extends until the commencement of the day's agenda, signifying the **interval** between the two.

❍ Under this, Members of Parliament (MPs) can raise matters without any prior notice.

❍ Zero Hour is an Indian parliamentary innovation. The phrase is not mentioned in the **rules of procedure**.

➢ Zero Hour originated in early Indian Parliament as MPs sought to address constituency and national concerns informally before the lunch break, starting around 12 noon and lasting until adjournment.

❍ This led to the hour being popularly referred to as Zero Hour and the issues being raised during this time as **Zero Hour submissions.**

Read more: Question Hour and Zero Hour, Questioning in Parliament

Volt Typhoon

Microsoft has detected covert, targeted malicious activity by the **Chinese state-sponsored group Volt Typhoon,** aimed at **post-compromise credential access** & **network system discovery,** targeting US **critical infrastructure.**

➢ Volt Typhoon affecting various sectors including **communications, manufacturing,** utilities, transportation, construction, maritime, government, IT, and education.

❍ Observed behaviour indicates a **covert intent** for prolonged undetected espionage and access retention.

● To reach their goal, the attacker **focuses on stealth,** using basic techniques to collect data and maintain access, while disguising their activity within regular network traffic, often through compromised home office equipment and custom tools for remote control.

➢ **Equation Group (USA), Fancy Bear (Russia), APT37 (North Korea), Turla (APT34) (Iran), SandWorm (Russia),** etc. are some of the other hacking groups used by security agencies.

Read More: Cyber Security

Use of Nitrogen Gas for Capital Punishment

Recently, the execution in the **United States** using **nitrogen gas** (for the first time since 1982) prompted discussions on the ethics and efficacy of **capital punishment**.

➢ The execution triggered public outcry and reignited debates on the **moral and legal aspects of capital punishment.**

➢ **Nitrogen gas** is used as a method of execution by inducing **hypoxia**, a lack of oxygen, which leads to unconsciousness and eventually death.

❍ The process typically involves the individual being placed in a sealed chamber or wearing a face mask through which nitrogen gas is pumped.

❍ As the person breathes in the nitrogen, it replaces oxygen in the lungs, leading to oxygen deprivation in the bloodstream and brain.

Read more: Raising the Bar on Capital Punishment

Jasprit Bumrah Tops ICC Men's Test Bowling Rankings

The **Indian cricket team's** fast bowler, Jasprit Bumrah, became the first Indian pacer to top the **ICC Men's Test Bowling Rankings** after his stupendous bowling performance in the **Visakhapatnam Test against England**.

➢ Bumrah surpassed **Pat Cummins, Kagiso Rabada, and Ravichandran Ashwin** to attain the number one spot, becoming just the **fourth Indian to achieve** the feat after **Bishan Singh Bedi, Ravindra Jadeja and Ashwin** (all spinners).

➢ Kane Williamson from New Zealand currently tops the ICC Men's **Test Batting Rankings.**

Read more: Pay Parity in Cricket

Kufos Joins NISAR Phase II Project

The **Kerala University of Fisheries and Ocean Studies (Kufos)** will participate in the advanced **NASA-ISRO Synthetic Aperture Radar (NISAR) Phase II research project,** focusing on **forest biomass** and **carbon monitoring** through radar data.

Note:

- This collaboration follows the successful completion of the initial phase of the **Indian Space Research Organisation (ISRO)-NISAR program** that focused on validating ground truth data in forest biomass across various regions
- NASA and ISRO are jointly developing a **space-borne synthetic aperture radar,** scheduled for launch in 2024.
  - ❍ NISAR aims to revolutionise earth resource observation by providing high-resolution data for extensive areas.
  - ❍ The project holds significant potential for systematic monitoring of **agriculture, forestry, wetlands, and soil moisture** estimation.

  Read more: NISAR Mission

EU Sets New Climate Goal for 2040

The **European Union (EU)** has recently introduced its new proposed **2040 climate goal,** outlining a **net emissions** reduction target of 90% by 2040 compared to the 1990 baseline levels.

- EU's previous goal set in September 2020 aimed at cutting **greenhouse gas emissions (GHG) by 55% below 1990 levels by 2030**, which was later enshrined in the EU Climate Law along with a commitment to achieve **carbon neutrality** by 2050.
  - ❍ To accompany the target, the European Commission released a **"Fit for 55" package in 2021,** which provided a set of proposals to achieve the 2030 reduction target.
- The latest 2024 proposal is an interim step required by the EU Climate Law, which outlines a process to develop a 2040 target within **six months of the first Global Stocktake (GST),** which concluded at the **28th CoP to the UNFCCC in Dubai**.
  - ❍ The proposal highlights the need for a **significant reduction in coal usage by 2040,** with **natural gas** expected to decline rapidly, and **oil being the last to be phased out.** However, some **fossil fuels will remain in use** for non-energy purposes and long-distance transport.
- Critics argue that the proposed targets fail to address the **EU's historical emissions burden adequately.**
- Heavy reliance on **carbon capture** and **CO_2 removal technologies** raises concerns about the ambition and effectiveness of the target.

  Read more: 28th Conference of Parties To the UNFCCC, European Union (EU)

GRAPES-3 Experiment

The **GRAPES-3** experiment in **Ooty, India,** operated by the **Tata Institute of Fundamental Research** has discovered a new feature in the **cosmic-ray** proton **spectrum.**

- It was observed at about **166 tera-electron-volt (TeV) energy** while measuring the spectrum spanning from 50 TeV to a little over 1 peta-electron-volt (PeV).
  - ❍ "GRAPES-3 experiment discovers new feature above 100 TeV but below the **cosmic-ray proton "Knee,"** suggesting a deviation from **single power-law spectrum."**
- The observed feature suggests a **potential re-evaluation** of our understanding of cosmic-ray sources, acceleration mechanisms, and their propagation within our galaxy.
  - ❍ Centuries-old discovery, cosmic rays are the universe's **most energetic particles,** bombarding **Earth** uniformly from all directions, inducing fast-moving particle showers comprising electrons, **photons, muons, protons, neutrons,** etc.
    - Cosmic rays exhibit a **broad energy range** (10^8 to 10^20 eV) with a steeply decreasing flux based on a power law.

  Read more: Cosmic Rays

Maa Kamakhya Divya Pariyojana

Recently, the Indian Prime Minister laid the foundation stone of **Maa Kamakhya** Divya Pariyojana (Maa Kamakhya Access Corridor)**.**

- It has been sanctioned under the **Prime Minister's Development Initiative for North Eastern Region (PM-DevINE) scheme**.
- Situated on the **Nilachal hills in Guwahati, Assam**, Kamakhya temple is a significant pilgrimage centre.
- The temple is dedicated to different forms of Mother Shakti, namely **Sundari, Tripura, Tara, Bhuvaneshvari, Bagalamukhi and Chinnamasta.**
- **Ambubachi Mela** is one of the major festivals of this temple. The festival is held every year **to commemorate the yearly menstruation of Goddess Kamakhya.**

Note:

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UPI Goes Global from Eiffel Tower

Recently, **Unified Payments Interface (UPI)** was formally launched at India's **Republic Day** celebration in **Paris, France,** at the iconic **Eiffel Tower.**

➢ This event marks a significant step towards **globalizing UPI** and **promoting digital payments**,

➢ Developed by the **National Payments Corporation of India (NPCI)** in 2016, UPI is an instant payment system that integrates multiple bank accounts into a single mobile application, simplifying various **banking functions, fund transfers, and merchant payments**.

➢ The partnership between NPCI's subsidiary, **NPCI International Payments (NIPL), and France's Lyra Collect** has led to an agreement to introduce UPI in France and Europe.
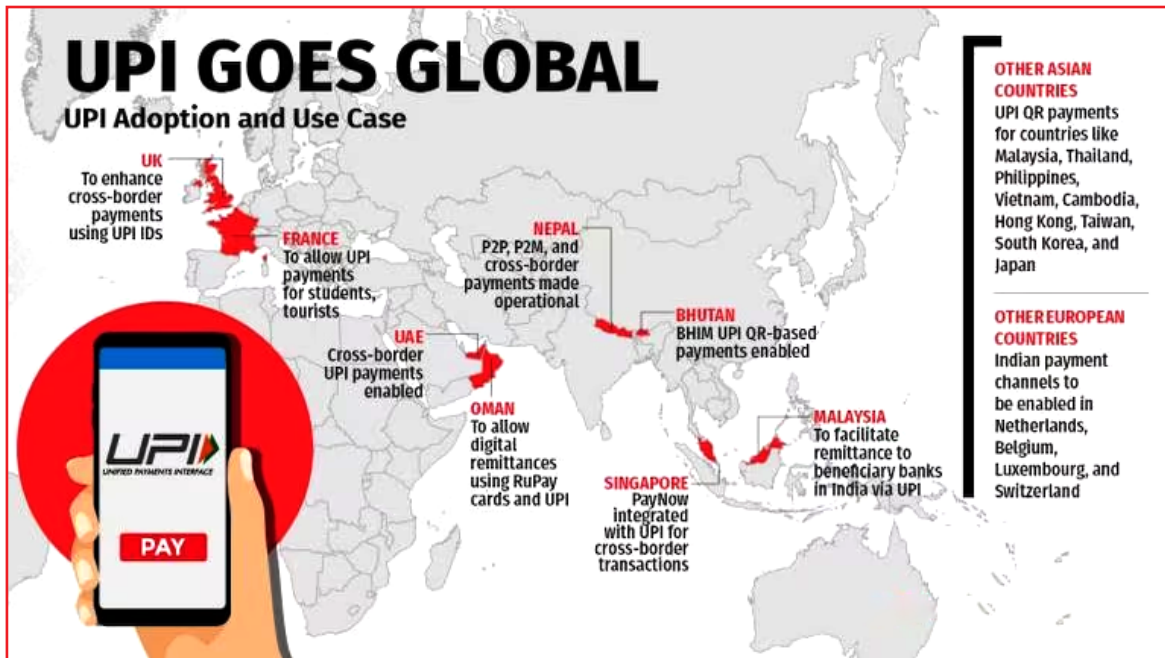
Read more: Unified Payments Interface

CLEA - Commonwealth Attorneys and Solicitors General Conference 2024

Recently, the **Indian Prime Minister** inaugurated the **Commonwealth Legal Education Association (CLEA) - Commonwealth Attorneys and Solicitors General Conference (CASGC)** 2024 in New Delhi, emphasising the significance of global cooperation in addressing contemporary legal challenges.

➢ The conference, themed "**Cross-Border Challenges in Justice Delivery,**" convened leading legal minds to deliberate on issues including judicial transition, ethical dimensions of legal practice, and executive accountability.

➢ It witnessed the participation of Attorney Generals **and Solicitors** from the Commonwealth nations spanning the Asia-Pacific, Africa, and the Caribbean along with various international delegations.

➢ It was highlighted that **trade and crime transcend geographical boundaries** necessitating a reevaluation of legal frameworks.

❍ International cooperation is essential in resolving diverse issues, including **cyber fraud and terrorism**.

Read more: Attorney General of India

Note:

Manatee Gathering at Florida Park

Blue Spring State Park, Florida, USA reported a gathering of nearly 1,000 **manatees**. The gathering of manatees may be due to several reasons, like-

➢ **Drop in temperature** to 14.1°C, a decline in **seagrass** (manatees' primary food), due to **algae blooms on Florida coast,** and to seek protection from **watercraft collisions**.

➢ **Manatees (sea cows)** are typically **solitary animals.**

    ○ **Sea cows, comprising manatees and dugongs,** consist of four manatee species and one dugong species, belonging to the herbivorous *Dugongidae family*.

      ● Manatees dwell in zones such as the Caribbean, Gulf of Mexico, Amazon, East and West Africa, while **dugongs inhabit coastal regions of the Indian and Pacific Oceans**.

      ● **IUCN Status:** Manatees and dugongs are both are **Vulnerable.**

      ● **Dugongs: Schedule 1** of the **Wild Life (Protection) Act, 1972**.

Read more: Manatees

Ancient Subika Painting

In a bid to preserve Manipur's rich cultural heritage, a concerted effort is underway to revive the ancient **Subika painting style in Manipur**, which is on the brink of extinction.

➢ The Subika painting style is intricately linked to the **Meitei community's** cultural history through its six surviving manuscripts: **Subika, Subika Achouba, Subika Laishaba, Subika Choudit, Subika Cheithil and Thengrakhel Subika.**

➢ Despite holding significant historical value, the painting has faced neglect over the years, leading to a decline in awareness.

➢ The paintings are **done on handmade paper, and the materials for manuscripts,** such as handmade paper or tree bark, are prepared locally.

Read more: Indian Painting

Child Safety Portals

Recently, the Union Ministry of Women and Child Development provided valuable insights into the **Track Child Portal and GHAR - GO Home and Re-Unite portal** during a written reply in the Lok Sabha.

➢ The **Track Child Portal** enables tracking of missing and found children across states and UTs, supported by various stakeholders.

    ○ The **"Khoya-Paya"** feature allows citizens to report missing or sighted children, fostering community involvement.

➢ It is also integrated with the **Crime and Criminal Tracking & Network Systems of the Ministry of Home Affairs**, which allows interoperability in terms of matching of F.I.Rs of missing children

➢ Further, a portal namely **GHAR - GO Home and Re-Unite (Portal for Restoration and Repatriation of Child)** has been developed and launched by **National Commission for Protection of Child Rights** to digitally monitor and track the restoration and repatriation of children as per the protocols under the **Juvenile Justice (Care and Protection of Children) Act, 2015.**

Read more: Social Protection for Children

Note:

Assam's Traditional Buffalo and Bulbul Fights

The Assam government's efforts to revive **traditional buffalo and bulbul (songbird) fights** during **Magh Bihu** festival face legal challenges from **People for the Ethical Treatment of Animals (PETA)**, who filed petitions in the Gauhati High Court to prohibit both these practices.

➢ These fights, part of the folk culture linked to the **Assamese winter harvest festival, Magh Bihu,** were stopped following a 2014 Supreme Court ruling on **animal cruelty.**

➢ However, in 2023, the Supreme Court allowed **amendments to the Prevention of Cruelty to Animals Act,** leading to the revival of such events.

  ❍ A recent controversy over a buffalo fight scheduled outside the designated period has prompted legal intervention.

➢ This issue highlights the tension between preserving cultural heritage and addressing ethical concerns in modern society.

  Read More: Harvest Festivals, Jallikattu, Kambala

Vyommitra

Recently, the Ministry of Science & Technology announced that **woman robot astronaut "Vyommitra"** will fly into Space ahead of **Indian Space Research Organisation's (ISRO)** ambitious **"Gaganyaan" mission,** which will be **India's first human manned Space Flight** carrying Indian Astronauts into Space.

➢ The "Vyommitra" Mission is scheduled for the third quarter of 2024 while a **manned mission "Gaganyaan"** is scheduled to be launched in 2025.

➢ "Vyommitra" is a name derived from two Sanskrit words namely, **"Vyoma" (meaning Space) and "Mitra" (meaning Friend).** This Female Robot Astronaut is equipped with the capability to **monitor Module Parameters, issue Alerts and execute Life Support operations.**

  ❍ It can perform tasks such as operating six panels and responding to queries.

  ❍ Vyommitra Astronaut is designed in such a manner to **simulate human functions in the Space environment** and interact with the Life Support System.

➢ The Gaganyaan project aims to **demonstrate human space capabilities,** launching astronauts into a 400-kilometer orbit and safely bringing them back to Earth, landing in India's sea waters.

Vyommitra: India's First Spacefaring Robot

Read more: Space Missions in 2024, India's Space Endeavors

India Energy Week 2024

The Prime Minister of India inaugurated the **India Energy Week** (IEW) 2024 in Goa and will inaugurate, and the **Oil and Natural Gas Corporation Limited (ONGC)** Sea Survival Centre, and also participated in the **Viksit Bharat,** Viksit Goa 2047 programme.

➢ **India Energy Week 2024** is being held from **6th to 9th February in Goa**. It is India's **largest and only all-encompassing energy exhibition and conference,** bringing together the entire energy value chain, and will catalyse **India's energy transition goals.**

  ❍ Encouraging, fostering and integrating startups into the energy value chain will be an important focus for IEW 2024.

  ❍ India's position as the **world's third largest energy, oil, and Liquid petroleum gas (LPG) consumer,** as well as the **fourth largest Liquefied natural gas (LNG) importer and refiner,** was emphasised at IEW.

  ❍ The event reflects **India's commitment to global cooperation in the energy sector,** with a focus on collaboration and knowledge sharing in sustainable energy development.

➢ ONGC Sea Survival Centre is an **Integrated Sea Survival Training Centre** to advance the **Indian sea survival training ecosystem** to global standards.

  ❍ It is anticipated to train 10,000-15,000 personnel annually, emphasising simulated exercises in harsh conditions.

  Read more: India Energy Week

Note:

NCGG Empowers African Civil Servants

The **National Centre for Good Governance (NCGG)**, recently concluded its Advanced Leadership Development Programme on Public Policy and Governance for **Civil Servants** of the **African Region**.

➤ It focused on **Land Administration, Sustainable Development, and Public Policy Practices** and was attended by officers from **Eritrea, Kenya, Ethiopia, Tanzania, and Gambia,** the program aimed to foster collaboration and knowledge exchange.

○ Also, a MyGov portal has been established in Gambia.

➤ It marks a significant achievement for NCGG in its role as a capacity-building institution under the **Indian Technical and Economic Cooperation Programme (ITEC) program**.

➤ Instituted in 1964, ITEC is the leading capacity-building platform of the **Ministry Of External Affairs, Government of India**.

➤ NCGG was set up in 2014 by the Government as an apex–level autonomous institution under the **Ministry of Personnel, Public Grievances and Pensions.**

Read more: Good Governance, India-Africa Partnership

Bharat Ratna to LK Advani

Recently, the government has announced that Veteran leader, **Shri Lal Krishna Advani** will be conferred with **Bharat Ratna,** the highest civilian award of the nation.

➤ He served as the **7th Deputy Prime Minister of India** from 2002 to 2004. He also served as a Home Minister and Information and Broadcasting Minister as well.

➤ Born in **Karachi (present-day Pakistan)** on 8th November 1927, he joined the Rashtriya Swayamsevak Sangh in 1942 and relocated to Delhi from Sindh in **1947 during Partition.**

➤ Instituted in **1954**, the **Bharat Ratna** is conferred in recognition of exceptional service/performance of the highest order, without distinction of race, occupation, position, or sex.

Read more: Bharat Ratna to Karpoori Thakur

NITISH Device

The Bihar State Disaster Management Authority has launched the **Novel Initiative Technological Intervention for Safety of Humanlives (NITISH) device,** an innovative pendant-shaped technology designed to provide timely alerts to farmers and the public, specifically targeting **lightning, floods, heatwaves,** and **coldwaves.**

➤ The initiative was triggered by **recurring deaths among farmers** due to lightning and **flash floods**, emphasizing the device's role in saving lives.

➤ The NITISH Device is introduced in collaboration with the **Indian Institute of Technology (IIT), Patna.**

➤ The device is connected to the **Bihar Meteorological Service Centre,** ensuring **real-time and accurate weather-related alerts.**

➤ The NITISH device will sound an alert to its users half an hour before **lightning or flooding.**

➤ The pendant will get **charged from body heat.** The device will sound an alert in three ways: it **will send voice messages**; its **colour will change from green to red**; and the device will **keep warming till its user switches it off**.

➤ Considering the challenges faced by farmers, the **device is waterproof,** ensuring durability and **functionality in various weather conditions.**

Read more: Emergency Alert System

Exercise Vayu Shakti- 2024

The **Indian Air Force** will be conducting **Exercise Vayu Shakti-24** on 17th February 2024 at the **Pokhran Air to Ground Range,** near **Jaisalmer.**

➤ Exercise Vayu Shakti is set to deliver a compelling display of the Indian Air Force's **offensive** and **defensive prowess**, seamlessly operating both day and night.

Note:

➤ Additionally, the exercise will highlight **collaborative manoeuvres** with the **Indian Army**, showcasing their joint operational capabilities.

➤ The exercise will showcase IAF's prowess in precision, long-range weapon delivery, and effective operations from various air bases, including special missions with transport, helicopter fleets, Garuds, and Indian Army elements.

   ❍ This year, 121 aircraft, including **Tejas, Prachand, Dhruv, Rafale, Mirage-2000, Sukhoi-30 MKI,** Jaguar, Hawk, C-130J, **Chinook, Apache, and Mi-17**, will participate in the exercise, showcasing the capabilities of indigenous Surface to Air Weapon systems **Akash** and Samar in tracking and shooting down intruding aircraft.

   Read more: EXERCISE VAYUSHAKTI

Kalaripayattu

Haryana youth made significant strides in embracing **Kalaripayattu,** securing the second position, just **after Kerala** at the **Khelo India Youth Games 2023.**

➤ Kalari Payat (Kalaripayattu) meaning **'Battleground' or 'Gymnasium'- (Kalari), 'Method' or 'Art' - (Payatt),** also known as Kalari, is an Indian martial art that originated in **Kerala during the 3ʳᵈ century BC to the 2nd century AD**. It is now practised in Kerala and in some parts of Tamil Nadu.

   ❍ It is considered one of the **oldest and most scientific martial arts** in the world, with a history spanning over 3,000 years.

➤ Kalaripayattu, a **personal combat training system** includes exercises to develop sharp reflexes for unarmed combat and skilful fighting using sticks, daggers, knives, spears, swords, shields, etc.


Read more: 6ᵗʰ Edition of Khelo India Youth Games, Martial Art Forms in India

Dusted Apollo Butterfly

Recently, the **Dusted Apollo (*Parnassius stenosemus*),** a rare high-altitude **butterfly,** was sighted and photographed for the first time in Himachal Pradesh's Chamba.

➤ The Dusted Apollo butterfly was discovered in **1890** and its distribution range extends from **Ladakh to West Nepal,** flying between 3,500 to 4,800 meters in the inner Himalayas.

   ❍ It is a member of the **snow Apollo genus (*Parnassius*) of the swallowtail family.**

➤ The Dusted Apollo species closely resembles **Ladakh Banded Apollo (*Parnnasius stoliczkanus*)** but the **discal band (band on a butterfly's wing)** on the upper fore wing in dusted Apollo is complete and extends from costa to vein one while this discal band is incomplete and extends only up to vein four in Ladakh Banded Apollo.

➤ The sighting also included another rare species, **Regal Apollo (*Parnnasius charltonius*),** which is protected under **Schedule II of the Wildlife Protection Act, 1972.**
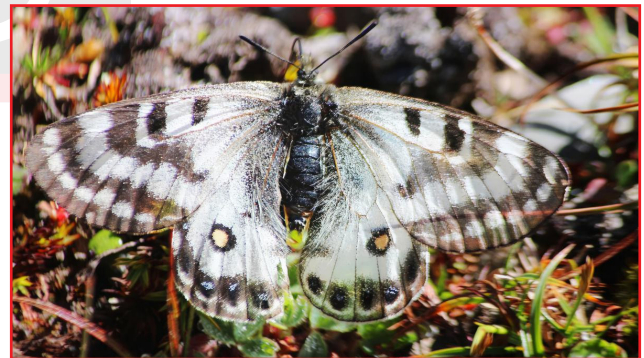
Read more: Butterflies Adaptation and Evolution Processes

Sandhayak

The Indian Navy is all set to commission its **latest Survey Vessel Sandhayak (Y-3025),** at Naval Dockyard, Visakhapatnam, Andhra Pradesh.

➤ The primary role of the ship is to **carry out full-scale hydrographic surveys of ports,** harbours, navigational channels/routes, coastal areas and deep seas, towards enabling safe marine navigation.

   ❍ In its secondary role, the ship will be **capable of undertaking a range of naval operations.**

Note:

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➢ Sandhayak is equipped with **hydrographic equipment** including Deep & Shallow Water Multibeam Remotely Operated Vehicle, Side Scan Sonars, Data Acquisition and Processing System, satellite-based positioning systems and terrestrial survey equipment.

➢ Sandhayak, a testament to India's shipbuilding prowess, **with 80% indigenous content,** aligns with the nation's drive towards **Aatma Nirbhar Bharat.**

Digital Detox Initiative for Responsible Tech Use

The **Government of Karnataka,** in collaboration with the **All India Game Developers Forum (AIGDF),** is set to launch a **Digital Detox initiative**, concentrating on gaming and social media.

➢ Digital Detox Centers will be established across Karnataka, offering personalized guidance, counselling, and practical tools to manage screen time effectively.

➢ AIGDF is a **not-for-profit** collective under the aegis of the **All India Gaming Federation (AIGF)**.

➢ The Indian gaming market is expected to grow from **USD 2.8 billion in 2022 to USD 5 billion in 2025,**
   Read more: **Decoding Online Gaming Ethics**

The Marvel of E Ink Displays

E Ink displays are transforming **visual technology** through their minimal power usage, eye-friendly features, and diverse applications.

➢ E Ink displays are a type of electronic paper display technology that mimics the appearance of traditional ink on paper.

   ❍ It uses millions of **tiny microcapsules** filled with positively charged white particles and negatively charged black particles suspended in a clear fluid.

❍ Often confused with **E Paper**, E Ink is a specific technology within the E Paper category.
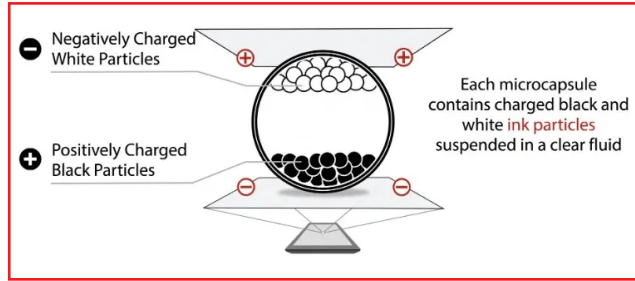
➢ In contrast to **LCD and LED displays** that use backlight, **E Ink reflects light like paper,** reducing eye strain and requiring minimal power, as it only consumes energy during image changes.

➢ Its applications range from e-readers like Kindle to **innovative uses in smartphones, bus stop displays, walking direction signs, and restaurant menu boards**.
   Read more: **Light Emitting Diodes (LED)**

C-CARES Web Portal

Recently, the Ministry of Coal (MoC) launched the **C-CARES web portal** of the **Coal Mines Provident Fund Organization (CMPFO).**

➢ The C-CARES web portal is developed by the **Centre for Development of Advanced Computing (C-DAC),** a Research and development organization under **MeitY,** the portal promises to revolutionize **record-keeping and streamline processes for CMPFO** subscribers and pensioners.

➢ CMPFO is an **autonomous organization** under the **MoC** for administering **Provident Fund and Pension schemes** for social security in the **coal sector.**

   ❍ The Organization is presently rendering services to about **3.3 lakh Provident Fund subscribers and 6.1 lakh pensioners of the coal sector.**

➢ C-CARES will enable CMPF subscribers and coal companies to perform various functions tailored to their needs, including **online settlement of claims,** paperless working, timely and accurate settlement of claims, reduction in processing time, and grievance redressal.

➢ This digital transformation aligns with the **vision of Digital India.**
   Read more: Digital India

Note:

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MQ-9B Sky Guardian

Recently, the US State Department has approved a possible foreign military sale of **31 MQ-9B Sky Guardian** to India.

➢ The MQ-9B Predator drone is an **unmanned aerial vehicle.** MQ-9B SeaGuardian is a maritime-focused version of the **SkyGuardian remotely piloted aircraft system (RPAS).**

➢ The MQ-9B drones are also known as **"Predators".** They are **High Altitude Long Endurance (HALE) drones** that can fly for **over 40 hours using a satellite.**

   ❍ Out of the **31 MQ-9B Predator drones,** of which the **Navy** **will get 15 SeaGuardian drones,** while the **Army** **and the Indian Air Force** will get eight each of the land version – **SkyGuardian**.

➢ They can be used for offensive missions, reconnaissance, surveillance, and intelligence operations.

MQ-9B
Predator Drones

Max Gross Takeoff Weight: 5,670 kg
Fuel Capacity: 2,721 kg
Payload Capacity: 2,177 kg across 9 hardpoints (8 wing, 1 centerline)

Crew:
Two pilots in ground control stations

Weapons
Laser guided missiles
Anti-tank missiles
Anti-ship missiles

Missions
• Humanitarian Assistance/Disaster Relief
• Search and Rescue
• Law Enforcement
• Border Enforcement
• Defensive Counter Air
• Airborne Early Warning

Missions
Electronic Warfare •
Anti-Surface Warfare •
Anti-Submarine Warfare •
Airborne Mine Counter Measures •
Long-Range Strategic ISR •
Over-the-Horizon Targeting •

Read more: India Approves Acquisition of MQ-9B Armed Drones from the US

Indian Gray Wolf

Recently, The Indian **gray wolf** has recently been sighted in the confines of **National Chambal Sanctuary (NCS)** in Uttar Pradesh.

➢ The last sightings were reported during **'Operation Bhediya'** carried out between **1997** and **2000** to map the canines' footprint in Chambal.

➢ **Scientific Name:** *Canis lupus pallipes*

➢ **Conservation Status**
   ❍ **IUCN:** Least Concern
   ❍ **Wildlife (Protection) Act of 1972:** Schedule I
   ❍ **CITES** : Appendix 1

➢ **National Chambal Sanctuary,** is also known as the **National Chambal Gharial Wildlife Sanctuary**.

➢ NCS is located on the **Chambal River** near the tri-point of **Rajasthan, Madhya Pradesh** and **Uttar Pradesh.**

Read More: Captive-bred Wolves into the Wild in Gujarat

Trans Fatty Acids (TFAs)

Recently, The **World Health Organisation (WHO)** awarded countries for progress in eliminating industrially produced trans fats for the first time.

➢ **WHO** has awarded its first-ever certificates validating progress in eliminating industrially produced trans fatty acids to five countries- **Denmark, Lithuania, Poland, Saudi Arabia,** and **Thailand**.

➢ WHO's ambitious target to fully eliminate industrially produced trans-fatty acids (TFAs) from the global food supply by the end of **2023** was not met. However, it proposes a revised new target for the virtual elimination of iTFA globally by **2025**.

➢ **Trans fatty acids (TFAs)** or **Trans fats** are the most harmful type of fats which can have much more adverse effects on the human body than any other dietary constituent.

   ❍ These fats are largely produced artificially but a small amount also occurs naturally.

Note:

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TRANS FATTY ACIDS (TFA)

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These are unsaturated fatty acids that come from either natural or industrial sources.

FATS
- ❌ Trans Fats
- ❌ Saturated Fats
- ✅ Unsaturated Fats

Fat	A major source of energy and helps body absorb vitamin
Unsaturated Fats	Good fats; usually come in the form of liquid oils, not solid fats. ➡ From Plants (Vegetable oil, nuts, seeds)
Saturated Fats	Not as harmful as trans fats if consumed in moderation; generally take a solid form ➡ From red meat, butter, cheese, coconut oil, palm oil

- ➡ **Natural TFA:**
  - ➋ Beef fat and dairy fat in small amounts
- ➡ **Industrial TFA:**
  - ➋ Trans fats, also called partially hydrogenated oils, are created when hydrogen is added to vegetable oil tomake it more solid.
  - ➋ E.g. Vanaspati, margarine and bakery shortenings
- ➡ **Issue Associated:**
  - ➋ Most harmful fats, increase disease risk, even if consumed in small quantities
  - ➋ ↑bad LDL (low-density lipoprotein) and ↓ good HDL

DEBATE ON TRANS FATS

ARGUMENTS FOR:
- ➡ **Natural form** of trans fat **not** harmful to humans
- ➡ **Cheap and easy substitute** of Pure Ghee
- ➡ **Preserves food** for longer duration

ARGUMENTS AGAINST:
- ➋ Worst type of fat for the heart, blood vessels, rest of the body
- ➋ Associated with obesity, infertility, certain types of cancers, high B.P.
- ➋ Saturated vegetable fats like palm, palm kernel, and coconut oils can be suitable alternatives

WHO estimates that 50,00,000 lives are lost due to premature deaths from coronary heart disease which are attributable to consumption of trans-fats.

EFFORTS TO REDUCE TFA INTAKE:

- ➡ **By FSSAI:**
  - ➋ Goal of **"Freedom from Trans Fat @75"**
  - ➋ **"Trans Fat Free" logo** - Voluntary labelling to promote TFA-free products
  - ➋ **"Heart Attack Rewind"** - Mass media campaign to eliminate industrially produced trans fats

- ➡ **By WHO:**
  - ➋ **REPLACE Campaign** - Eliminate industrially produced trans fats by 2023
  - ➋ **Recommendation**- Set limits on industrially produced trans fat or ban partially hydrogenated oils

Read More: Trans Fatty Acids

High-Velocity Air Fuel Spraying

In the quest for eco-friendly alternatives to **hard chrome plating (HCP),** scientists from the **International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI),** an autonomous institution of the **Department of Science and Technology (DST)** affiliated institution, have pioneered a technique called **high-velocity air fuel spraying (HVAF).**

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➢ This method holds the potential to transform the landscape of surface coatings, **offering a safer and more efficient solution** for car parts, tools, and kitchen utensils.

  ❍ HCP is an **electroplating process** in which a layer of **chromium** is applied to a surface to **improve corrosion and wear resistance, reduce friction,** and **extend the life of parts** used in extreme working environments.

  ❍ HCP contains **carcinogenic substances** prompting the search for a safer alternative.

➢ HVAF spraying involves **low temperatures and high particle velocities,** allowing the deposition of coatings using finer-sized powders (5-15 μm).

  ❍ Scientists synthesized thin hard coatings of a **composite alloy of Tungsten, cobalt, and chromium** by high-velocity air fuel spraying.

➢ HVAF-sprayed coatings have **shown superior sliding wear performance** and **corrosion resistance** compared to conventional HCP.

  ❍ The technique **reduces the need for grinding and polishing operations,** leading to **cost savings** in processing and raw materials.

➢ The new technique can be a better alternative to HCP for heavy-load applications like hydraulic shafts, valves, piston rods, and balls.

  Read more: Nickel Alloy Coatings

Raising Day of ICG

The **Indian Coast Guard (ICG)** celebrated its 48ᵗʰ Raising Day on 1st February 2024.

➢ The interim **Indian Coast Guard (ICG)** came into being on **1st February 1977.** The ICG in its present shape was **formally inaugurated on 18th August 1978** as an **independent armed force** of the Union government with the enactment of the **Coast Guard Act 1978,** to prevent the **sea-borne smuggling** of goods that hampered the economy.

  ❍ The ICG is India's maritime security force, the responsibilities of the ICG include offshore security, marine safety, and coastal security as well as **safeguarding India's Exclusive Economic Zone (EEZ).**

➢ The force maintains order in international shipping lanes and India's vast seas.

➢ According to the **Comptroller and Auditor General of India,** ICG department is ranked as the **fourth largest Coast Guard in the world.**

  Read more: Indian Coast Guard

D.K. Basu Case

The **Supreme Court** expressed its oral observations on the **2022 incident in Gujarat** where four police officers were involved in publicly flogging an individual who was tied to a pole, accusing him of disrupting a garba event.

➢ SC questioned the authority of the officers to engage in such acts, emphasising the **1996 D.K. Basu judgment against police abuse.**

➢ The **D.K. Basu judgment** addressed that while the **police have the legal duty to arrest and interrogate criminals,** the law strictly **prohibits the use of third-degree methods or torture during custody.**

  ❍ **Third degree method** originally referred to the **physical brutality used by police officers during interrogations,** but over time, it has come to encompass various forms of abuse, including **psychological pressure,** sleep deprivation, and other forms of mistreatment.

  Read more: Custodial Violence

Auroville Exposure Tour

As part of the **Ek Bharat Shreshtha Bharat (EBSB) initiative,** students immersed themselves in sustainable living during the Auroville Exposure Tour.

➢ **Auroville is a universal township** in the making for a population of up to 50,000 people from around the world.

  ❍ It is located in **Viluppuram district of Tamil Nadu** (some parts are in **Puducherry**).

➢ It was founded by **Mirra Alfassa** in 1968 to implement **Sri Aurobindo's** vision of new forms of individual and collective life.

➢ It was officially endorsed by **UNESCO in 1966**, it focuses on sustainable living and addressing the future cultural, environmental, social, and spiritual needs of humanity.

Note:

drishti

Read more: Sri Aurobindo

India's Core Industries Performance

The combined **Index of Eight Core Industries (ICI) in India** exhibited a provisional growth of **3.8%** in **December 2023** compared to 2022. **Except crude oil, all other sectors have majorly performed well.**

➢ The **ICI** serves as a crucial metric, encompassing **Cement, Coal, Crude Oil, Electricity, Fertilizers, Natural Gas, Refinery Products, and Steel**, collectively constituting 40.27% of the **Index of Industrial Production (IIP).**

➢ IIP is a prime indicator of economic development for the measurement of trends in the **behaviour of Industrial Production** over a period of time with reference to a chosen base year.

   ○ Current base year for the IIP in India is **2011-12.**

Read more: Index of Industrial Production

Note: