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Drishti, 641, First Floor, Dr. Mukharjee Nagar, Delhi-110009

Inquiry: +91-87501-87501

Email: care@groupdrishti.in

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Note:

Polity and Governance

Highlights

- Watershed Development Component 2.0 of PMKSY
- Community Notes Programme Against Fake News
- Debate Over National Anthem
- Delays in Appointing Information Commissioners
- Karnataka HC Strikes Down Electricity Rules, 2022
- Draft Digital Personal Data Protection Rules, 2025
- Supreme Court Calls for Legislative Reviews
- Prioritising Oil Palm Plantation
- 10 Years of UJALA and SLNP
- CBI Exempt from State Consent for Central Employees
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- Third-Party Audits for Smart Cities Mission
- PMAY-G and Rural Poverty Alleviation in India
- Decline of Private Members' Bills in Indian Parliament

Watershed Development Component 2.0 of PMKSY

Why in News?

The Ministry of Rural Development sanctioned 56 new **Watershed Development** Projects under the Watershed Development Component 2.0 of **Prime Minister Krishi Sinchayee Yojna** (PMKSY-WDC 2.0), in 10 best performing States.

- 10 States include **Rajasthan, Madhya Pradesh, Karnataka, Odisha, Tamil Nadu, Assam, Nagaland, Himachal Pradesh, Uttarakhand and Sikkim** covering around **2.8 lakh hectares of degraded land**.

Note: In 2021-22, 1150 projects covering an area of about 50 Lakh hectares were sanctioned under PMKSY-WDC 2.0.

What is the Watershed Development Component of PMKSY 2.0?

- **About:** PMKSY-WDC 2.0 is a **sub-component** of the overarching **PMKSY initiative** for conserving **water and soil resources**.
- **Background:** The scheme started as the **Integrated Watershed Management Programme (IWMP)** in 2009-10 and merged into the Watershed Development Component of PMKSY (PMKSY-WDC) in 2015-16.

- **PMKSY-WDC 2.0** was launched for **2021-2026** with enhanced targets and revised guidelines.
- **Objectives:** Enhance **rainfed and degraded land productivity** through integrated watershed management.
 - Strengthen **community institutions** for livelihoods and **watershed sustainability**.
 - Boost **watershed project efficiency** via cross-learning and incentives.
- **Targets:** The scheme targets coverage of **49.50 lakh hectares** of degraded land between **2021-2026**.
 - **Rejuvenation of springsheds** has been added as a new activity.
- **Approach (Next-Generation Focus):** Emphasize **water productivity over quantity** and transition from mechanical treatments to **biological measures**.
 - Promote **crop diversification** and **integrated farming** systems like **horticulture, fisheries, apiculture, and animal husbandry**.

What is PMKSY?

- **About:** Launched in **2015-16** by the **Ministry of Jal Shakti**, PMKSY aims to improve **water access for farming, expand irrigated areas, enhance water use efficiency**, and promote sustainable water conservation.
 - It is a **Centrally Sponsored Scheme** with a **75:25 Centre-State share**, and **90:10** for the north-eastern and hilly states.

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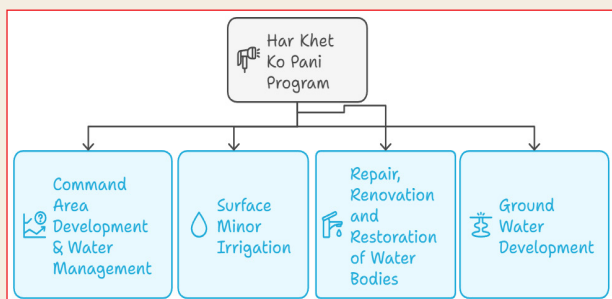


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Note:

- **Components:** It consists of **two major components** being implemented by the **Ministry of Jal Shakti**.
 - **Accelerated Irrigation Benefits Programme (AIBP):** **AIBP** aims to focus on **faster completion** of ongoing Major and Medium Irrigation including National Projects.
 - **Har Khet Ko Pani (HKKP):** **HKKP** consists of **four sub-components**.



- PMKSY also consists of **two other components** being implemented by **other Ministries**:
 - **Per Drop More Crop (PDMC)** by the Ministry of Agriculture & Farmers Welfare.
 - **Watershed Development component (WDC)** of PMKSY by the Ministry of Rural Development.

Community Notes Programme Against Fake News

Why in News?

Meta, the parent company of Facebook and Instagram, has scrapped its **3rd-party professional fact-checking** programme and **replaced** it with a **Community Notes programme** similar to **X platform** (formerly Twitter).

- Meta said that fact-checking organisations had behaved in a **partisan way** and added that the **Community Notes programme** would face **fewer biases**.
- Experts warn that replacing fact-checkers with a community-based network could lead to **increased fake news** and **misinformation** in India.

What is a Community Notes programme?

- **About:** It is an **initiative of X**, aimed at combating misinformation and enhancing content quality through **user-generated context**.

- It **empowers users** rather than relying solely on centralized moderation teams.
- Community Notes was first **piloted** as a programme called **'Birdwatch'** by Twitter in **2021**.
- **Function:** Users provide notes on posts that need **clarification or additional context**.
 - Notes are **visible** only when a diverse group **agrees on their accuracy and usefulness**.
- **Algorithmic Review:** A **rating system** ensures that only the most **balanced and widely supported** notes appear publicly. This helps **mitigate bias and ensure fairness**.
- **No Editorial Oversight:** Unlike traditional fact-checking or moderation, the notes are **not edited or curated** by platform employees but are entirely community-driven.

Professional Fact Checkers

- **About:** Professional fact-checkers are **individuals or organizations** that **verify public claims** to **combat misinformation** in the digital age.
 - Meta collaborates with **11 independent**, certified fact-checking organisations covering content in **15 languages in India**.
- **Key Characteristics:** Professional fact-checkers are **trained, independent, and non-partisan**, using **evidence-based** methods and **ethical codes** for transparent claim verification.
- **Prominent Examples:** International ones include **PolitiFact, FactCheck.org, and Snopes**, while India-specific platforms are **Alt News, Factly, and Boom Live**.

What are the Concerns Regarding the Community Notes Programme in India?

- **Vulnerability to Misinformation:** Without professional fact-checkers, **untrained users** may struggle to identify biases and misinformation.
 - Without oversight, **political or biased content** may dominate, misleading large sections of the population.
- **Shifting Responsibility to Users:** User-flagged content may experience **delays in addressing misinformation** as companies **shift responsibility to the public**, resulting in **inconsistencies** and the potential **spread of false information**.

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Note:

- **Ideological Bias:** Without neutral fact-checking, content may **skew politically**, contributing to **manipulation and polarization**, especially in politically charged environments that may enforce **majoritarian views**.
- **Financial and Technical Challenges:** Losing support from platforms like Meta could **limit fact-checkers' scope**, weakening **fight against misinformation** and leaving gaps in content verification.
- **Diversity and Context:** India's **cultural and political diversity** makes community-based fact-checking challenging, as interpretations may vary.
 - Complex issues may require **professional expertise** to interpret accurately, which users may not provide.

Why is Fact-Checking Essential?

- **Fair Journalism:** Fact-checking ensures **media credibility**, **fosters transparency**, and **combats misinformation**, especially on social media, by correcting false claims and ensuring accurate news.
- **Political Integrity:** Fact-checking ensures **election integrity** by combating misinformation and **verifying political claims** to prevent misleading the electorate.
- **Technological Innovations:** The rise of **deep fakes**, **viral rumors**, and **manipulated media** requires professional journalists to investigate and verify content.
- **Accountability:** By scrutinizing and exposing **exaggerations or falsehoods**, fact-checkers ensure that those in power are held to high standards of truthfulness.

Popular Examples of Fake News from India

- **Muzaffarnagar riots** of 2013 caused by fake video fuelled communal passions
- UNESCO has declared '**Jana Gana Mana**' best national anthem in the world (WhatsApp)
- **GPS tracking nano chip** in 2000 Rupee notes (Nov 2016)
- A Indian politician used photo of Russian streets to show **LED-electrification of Indian streets**
- Ministry of Home Affairs (MHA) annual report used a picture of **Spain-Morocco border** to show Indian border floodlighting

What are Challenges in Tackling Fake News?

- **Lack of Legal Definition:** Most countries (including India), including those with robust free speech laws, **lack a clear legal definition of fake news**, complicating efforts to regulate it effectively.
 - A study found that **false information spreads 70% more quickly** than accurate news on social media platforms.
- **Balancing Regulation and Free Speech:** Efforts to curb fake news often risk being perceived as **censorship**, leading to **controversies** over freedom of expression and **content moderation practices**.
- **Passive Re-sharers:** A significant number of users **unknowingly share unverified content**, amplifying misinformation without malicious intent, which is harder to address with punitive measures.
- **Platform Accountability:** Social media platforms have limited accountability due to **safe harbor protections** making it challenging to hold them liable for user-generated content.
- **Language and Regional Diversity:** India, with over **22 official languages** and **hundreds of dialects**, faces unique challenges in combating fake news, as a **BBC study (2019)** revealed that misinformation often **spreads faster in regional languages** than in English or Hindi.
- **Rise of Deepfakes:** According to **Deepttrace Labs (2019)**, the number of deepfake videos online **doubled every 6 months**, with **96% related to disinformation or exploitation**.
 - **Deepfake** tools are now **widely accessible**, lowering the barrier for malicious actors.

What are Provisions to Tackle Fake News in India?

- **Press Council of India (PCI):** The **Press Council Act, 1978** allows the PCI to **censure or warn media outlets** for spreading fake news or professional misconduct.
- **News Broadcasters Association (NBA):** The **NBA** is a self-regulatory body that ensures **better control** over the quality and accuracy of content aired on **private television news channels**.

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- **Indian Penal Code (IPC):** Sections 153 and 295 of the **IPC (Bharatiya Nyay Sanhita)** can be invoked to deal with fake news that incites **violence, communal unrest, or insults religious sentiments**.
- **Defamation Laws:** Defamed individuals can file a case under **IPC Section 499**, with criminal defamation under **Section 500** carrying up to two years of imprisonment.
- **Section 66 in IT Act, 2000:** The **Information Technology (IT) Act, 2000** penalizes cybercrimes such as **identity theft (Section 66C)**, **cheating by impersonation (Section 66D)**, **privacy violations (Section 66E)**, transmitting obscene material (Section 67) etc.

Debate Over National Anthem

Why in News?

The **Governor** of Tamil Nadu left the **Legislative Assembly** without delivering his customary address on the opening day of the 2025 session citing **non-playing of the National Anthem** before his scheduled address.

- This has triggered a dispute over the ceremonial practices followed in the state legislature.

National Anthem & National Song

- The song **Jana-gana-mana (national anthem)** composed originally in Bangla by **Rabindranath Tagore (in 1911)**. It was adopted in its Hindi version as the national anthem of India.
 - It was **first sung on 27th December 1911 at the Calcutta Session of the Indian National Congress (INC)**.
- The **National Song of India** is “**Vande Mataram**”, written by **Bankim Chandra Chatterjee**.
 - The song was **first written in 1870** and later included in his novel “**Ananda**” in 1882. It was first sung at the **1896 INC session**.
 - It is a **patriotic hymn** that represents reverence for Mother India and was a source of inspiration during India’s struggle for freedom.
- Both **National Song and National Anthem of India were adopted by the Constituent Assembly on 24th January 1950**.

What are the Protocols and Conventions for Playing the National Anthem?

- **Presidential Address in Parliament:** During the **President’s** address, the **National Anthem** is played as the President reaches the dais. The President then delivers the address and then the **National Anthem is played again** as the President exits the house in a procession.
- **Governor’s Address to Sate Legislature:** Different states in India follow their own conventions regarding the playing of the National Anthem during legislative sessions.
 - **Nagaland:** The National Anthem was not played in the legislative assembly for several decades, and it was **first introduced in February 2021**.
 - **Tripura:** The National Anthem was first played in the Tripura Assembly in **March 2018**, reflecting a recent shift in its ceremonial practices.
 - **Tamil Nadu:** It follows a unique convention where the **State Anthem, Tamil Thai Vazhthu**, is played before the Governor’s address, and the **National Anthem is played at the end**.
 - This practice was introduced in 1991, before which the Governor would simply enter, deliver the address, and leave without such ceremonial practices.

Playing National Anthem in Cinemas

- In the case of **Shyam Narayan Chouksey vs Union of India (2018)**, the **Supreme Court** had initially passed an **interim order in 2016, directing all cinema halls in India to play the National Anthem** before the start of films, with attendees required to stand.
- However, in its final judgment in January 2018, the Court modified its stance, stating that the **playing of the National Anthem in cinema halls prior to films is not mandatory, but optional**.

What are the Safeguards to Protect the Honour of the National Anthem?

- **Constitutional Perspective:**
 - **Section 51 (A) (a)** of the **Constitution of India** dealing with **Fundamental Duties** states that “It shall be the duty of every citizen of India to abide

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by the Constitution and **respect** its ideals and institutions, the **national flag and the national anthem.**"

➤ **Prevention of Insults to National Honour (PINH) Act, 1971:**

- **PINH Act** provides for **strict punishment** for disrespecting the national anthem and breaking its restrictions with imprisonment for up to 3 years or a fine or both.
- A person convicted under the **PINH Act, 1971**, for offences such as **preventing the singing of the National Anthem** is disqualified from contesting elections to the Parliament and State Legislatures for a period of 6 years.

➤ **Ministry of Home Affairs (MHA) Guidelines:**

- The MHA mandates the playing of the **full National Anthem** during civil and military investitures, national salutes, parades, formal functions, and the arrival/departure of the President and Governor, as well as during the **National Flag's parade** and **Navy colour hoisting**.

Delays in Appointing Information Commissioners

Why in News?

The **Supreme Court** expressed **strong criticism** of the **chronic delay** shown by the **Centre and States** in appointing **Information Commissioners (ICs)** under the **Right to Information Act, 2005**. (RTI Act, 2005)

- Delays in appointing ICs **undermine** citizens' ability to exercise their **right to information**, with thousands of cases pending.

What are the Concerns

Regarding the RTI Act, 2005?

- **Delay in Appointment:** As of 2024, the **Central Information Commission (CIC)** has **8 vacancies** in the posts of ICs with **23,000 pending appeals** filed by citizens.
- Several **Information Commissions in States** have been **defunct since 2020**, and some have **stopped accepting petitions** under the **RTI Act, 2005**.

- Dissatisfaction with RTI responses from **Public Information Officers (PIOs)** often prompts citizens to **file first appeals** with the designated Appellate Authority.

- **Subordinate Rules:** The RTI Act's implementation **varies across states** due to **different rules**. E.g., Some states **lack online portals** or have inconsistent registration, complicating the process.

- **Lack of Transparency:** The majority of appointees to the position of ICs are **former bureaucrats** raising concerns about **impartiality and transparency** in the decision-making process.

- In **Anjali Bhardwaj and Ors v. Union of India Case, 2019**, the Supreme Court highlighted the need to **appoint people from diverse backgrounds**.

- **Personal Data Disclosure:** The RTI Act, 2005 allows **personal data disclosure** by the government if there's a **public interest**. However, The **DPDP Act, 2023**, changed this to a **complete ban** shielding powerful public officials from accountability.

- **Unilateral Amendments:** The **RTI (Amendment) Act, 2019** granted the Union Government the **sole authority** to determine the **tenure and salaries** of ICs potentially compromising their **autonomy**.

Note: **Digital Personal Data Protection Act, 2023** imposed a **blanket ban on personal data disclosure**, which could hinder public audits and accountability. Earlier, it **prevented** the government from **disclosing** citizens' personal data unless there's a **strong public interest**.

What are Key Facts About the RTI Act, 2005?

- **About:** RTI Act, 2005 was enacted to empower citizens with the **right to access information** from public authorities.
 - It aims to promote **transparency, accountability, and good governance** in the functioning of government bodies and public authorities.
- **Origin:** The RTI Act originated from a **1980s grassroots movement in Rajasthan**, where villagers demanded **accountability, and access to records**.
- **Key Provisions:**
 - The Act applies to **all levels of government**, including central, state, and local bodies.

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- **Section 8(2)** allows for the disclosure of information when the **public interest** outweighs confidentiality of information.
- **Section 22** ensures that the RTI Act takes **precedence** over any inconsistencies with other laws.
- **Exemptions:** The **Official Secrets Act (OSA), 1923** allows bureaucrats to **withhold information** to maintain the **confidentiality** of official documents.
- Other laws, like the **Indian Evidence Act, 1872 (Bharatiya Sakshya Adhiniyam)** and **All India Services Conduct Rules, 1968** allow officials to restrict information under the **RTI Act, 2005**.
- **Key Amendments in RTI Act, 2005:**
 - **Right to Information (Amendment) Act, 2019:** Under RTI Act, 2005, the term of the **Chief Information Commissioner (CIC)** and **ICs** is fixed at **5 years or until the age of 65**, whichever is earlier. After the Right to Information (Amendment) Act, 2019, the term is decided by the **Central Government**.
 - Originally, the **CIC's salary and terms of service** align with the **CEC**, and the **IC's** with an **Election Commissioner**. After amendments, **salaries, allowances, and terms of service** for both the **CICs** and **ICs** are prescribed by the **Central Government**.

What is the Central Information Commission?

- **Establishment:** It was established under the **RTI Act, 2005**, as a **statutory body** (not a constitutional body).
- **Composition:** The **Central Information Commission** shall consist of the **Chief Information Commissioner (CIC)** and such number of **Central Information Commissioners not exceeding 10** as may be deemed necessary.
- **Appointment:** Members are appointed by the **President of India** based on the recommendations of a committee comprising:
 - The **Prime Minister** (Chairperson).
 - The **Leader of Opposition** in the Lok Sabha.
 - A **Union Cabinet Minister** nominated by the Prime Minister.

- **Eligibility and Exemption:** Eminent individuals with experience in **law, science, technology, social service, management, journalism, or governance**.
 - Must **not be MPs, MLAs**, or hold any **office of profit**.
 - No political affiliations, business, or professional engagements.
 - They are **not eligible for reappointment**.
- **Powers of the CIC:** Summoning witnesses, inspecting documents, requisitioning public records, and issuing summons for examination.
- **Functions:** Its primary role is to ensure the effective **implementation of the RTI Act, 2005** and uphold citizens' right to information.
 - It deals with cases involving **offices, financial institutions, public sector undertakings**, and other entities under the **Central Government and Union Territories**.

Karnataka HC Strikes Down Electricity Rules, 2022

Why in News?

Recently, in the *Brindavan Hydropower Private Limited Case, 2024*, the Karnataka **High Court** struck down the **Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 2022 (GEOA Rules, 2022)**, formulated by the Central Government.

- The Court also **struck down** the **Karnataka Regulatory Commission (Terms and Conditions for Green Energy Open Access) Regulations, 2022**, which were framed by Karnataka **Electricity Regulatory Commission (KERC)** based on the now-invalidated **GEOA Rules, 2022**.

What are the Key Facts of the Case?

- **Petitioners' Arguments:** Hydroelectric companies challenged the **GEOA Rules, 2022**, asserting that the rule **infringed on KERC's exclusive powers** to frame rule under **Sections 42(2) and 181** of the **Electricity Act, 2003**.

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- **Centre's Defence:** The Central Government defended the rules, citing its powers under **Entry 14 of the Union List**, **Entry 38 of the Concurrent List**, and Section 176(1) of the Electricity Act, 2003.
 - It claimed the rules were **essential** to meet international treaty obligations under **COP26** Commitments at the **Glasgow Summit 2021**.
- **Reason for Striking Down:** The Court ruled that the Central Government **lacked authority** under the Electricity Act, 2003, to frame such rules, as these powers are **delegated to State Electricity Regulatory Commissions** like KERC.
 - The Court stated that the centre **cannot use Section 176(2) as a residual power** to override the regulatory framework.
 - Electricity Act, 2003 ensures that **regulatory powers**, including **tariff determination and open access provisions**, are exercised by independent regulatory commissions, free from governmental interference.

Note:

- **Electricity Policy, 2005** places the responsibility for facilitating **open access** squarely on **State Regulatory Commissions**.
- **Electricity Act, 2003:**
 - **Section 42(2):** It assigned the **Appropriate Commission** exclusive authority over **open access to distribution of licensees**.
 - **Section 181:** State Commissions may issue **regulations consistent with the Electricity Act, 2003** and its rules to implement its provisions.
 - **Section 176(1):** The **Central Government** may make rules for carrying out the provisions of this Act, 2003.
 - **Section 176(2):** It provided for **framing Rules for the specific purposes** enumerated therein. E.g., functions and duties of the Central Electricity Authority.
- **Entry 14 of the Union List:** It deals with entering into **treaties and agreements with foreign countries** and **implementing treaties, agreements and conventions** with foreign countries.

- **Entry 38 of the Concurrent List:** Electricity is a **concurrent subject** at Entry 38 in List III of the **seventh Schedule** of the Constitution of India.
 - The **Ministry of Power** is primarily responsible for the development of **electrical energy** in the country.

What are GEOA Rules, 2022?

- **About:** It was notified to **accelerate** India's ambitious **renewable energy programmes**, with the objective of ensuring access to **affordable, reliable, sustainable and green energy** for all through **open access**.
 - Open Access means a **consumer** can buy **electricity** from a person, **other than distribution licensee** of his area of supply.
- **Salient Features:**
 - **Green Energy:** It promotes the **generation, purchase, and consumption** of green energy, including energy from **Waste-to-Energy plants**.
 - **Lower Threshold:** The Open Access Transactions limit was reduced from **1 MW to 100 kW**, allowing **small consumers** to buy renewable energy.
 - **Right to Demand Green Power:** Consumers are **entitled to ask** for green power from **Discoms**, which **must supply it**.
 - **Uniform RPO:** A uniform **Renewable Purchase Obligation (RPO)** applies to all obligated entities, including **Green Hydrogen** and **Green Ammonia**.
 - RPO **mandates** obligated entities, such as **discoms**, to purchase a **certain percentage** of their electricity from **renewable energy (RE)** sources.
 - **Green Certificates:** Consumers using green energy receive **green certificates** as recognition.
 - Incentives like **caps on cross-subsidy** and removal of **extra surcharges** promote green energy.

What is the Status of India's Power Sector?

- India, the **third-largest electricity producer and consumer** (442.85 GW as of April 2024), saw power consumption grow by 9.5% in FY23.

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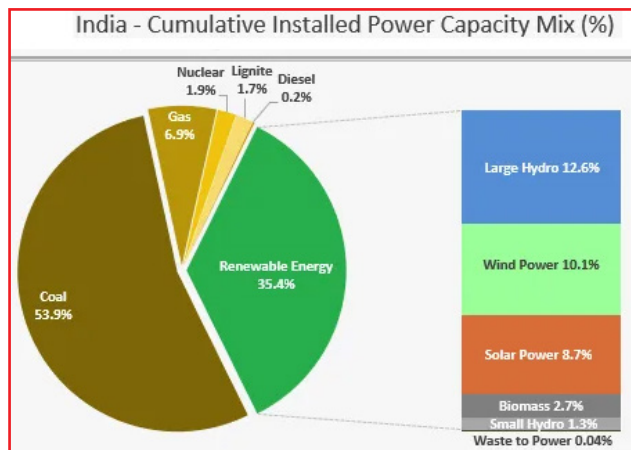
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Note:



- Energy projects form 24% of the **Rs. 111 lakh crore infrastructure pipeline**.
- The **aggregate technical & commercial (AT&C)** losses stands at **15.4%** in the fiscal year 2023.
 - Under the **Revamped Distribution Sector Scheme (RDSS)**, India aims to reduce the AT&C losses at pan-India levels to **12-15% by 2024-25**.
- **Committee Related to Reform in Power Sector:**
 - **Kirit Parikh Committee (2022):** Recommended pricing reforms for **petroleum and natural gas** linked to power generation.
 - **Ashok Chawla Committee (2011):** Studied **resource allocation**, including coal and natural gas for power generation.
 - **Deepak Parekh Committee (2008):** Recommended measures for **financing power sector projects**.

India's Updated NDC Target

- At the **COP26 Glasgow Summit, 2021**, India pledged to cut emissions **to net zero by 2070**, outlining a five-pronged "**Panchamitra**" climate action plan.
 - Achieve **500 GW** of non-fossil energy capacity by 2030.
 - Source **50%** of energy requirements from **renewable sources** by 2030.
 - Reduce projected carbon emissions by **1 billion tonnes by 2030**.
 - Lower **carbon intensity** of the economy by **45% by 2030** compared to 2005 levels.
 - Reach **net-zero** emissions by **2070**.

UNFCCC COP 29

About UNFCCC COP

UNFCCC Conference of Parties (COP)	Meets Annually (unless the Parties decide otherwise)	First COP	COP 29 (2024)
Supreme decision-making body of UNFCCC	In Bonn, the Secretariat (unless a Party offers to host the session)	Held in Berlin, Germany (1995)	Baku, Azerbaijan

Major Outcomes of COP 29

Key Goals & Agreements

- USD 300 billion annual climate finance goal by 2035 under the New Collective Quantified Goal on Climate Finance (NCQG)
- Agreement on gov't-to-gov't carbon markets (under the Paris Agreement)
- Extended Lima Work Programme on Gender (2014) for 10 years
- Over 30 countries endorsed → **Reducing Methane from Organic Waste Declaration** (India is not a signatory)

New Initiatives & Programs



Sector-Specific Declarations



India's Initiatives

- ◆ Advocated industrial decarbonisation & hydrogen solutions
- ◆ Endorsed disaster-resilient infrastructure through Coalition for Disaster Resilient Infrastructure
- ◆ Endorsed gender-inclusive climate action
- ◆ Supported solar energy adoption, targeting 20-fold increase by 2050
- ◆ India & Sweden co-chaired → 6th Annual Summit of the Leadership Group for Industry Transition (LeadIT)

COP 30 to be held in Belem, Brazil in November, 2025

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Draft Digital Personal Data Protection Rules, 2025

Why in News?

Recently, the Ministry of Electronics & IT has released draft Digital Personal Data Protection (DPDP) Rules, 2025 intended to safeguard citizens' right to protect their personal data.

What are the Key Points about the Draft DPDP Rules, 2025?

- **About:** It is a set of rules that operationalize the **Digital Personal Data Protection Act (DPDP Act), 2023**, to protect citizens' digital personal data while fostering India's **digital economy** and innovation.
- **Data Transfer:** The rules allow the transfer of **certain personal data outside India**, as approved by the government.
- **Citizens at the Core:** Citizens are granted rights to **demand data erasure, appoint digital nominees**, and have user-friendly mechanisms to manage their data by **Data Fiduciaries**.
 - Entities such as **social media platforms, e-commerce companies and online gaming platforms**, etc, that collect and process an individual's personal data are data fiduciaries.
- **Data Erasure:** Data retention is allowed for up to **three years** from the last interaction with the **Data Principal (Users)** or the effective date of the rules, whichever is **later**.
 - The Data Fiduciary must notify the Data Principal at **least 48 hours before erasure**.
- **Digital-First Approach:** The rules also prescribe a "digital by design" **Data Protection Board of India (DPBI)** for consent mechanisms and grievance redressal, for **faster resolution of complaints** and grievances online.
- **Graded Responsibilities:** Graded responsibilities cater to **startups and MSMEs** with **lower compliance** burden, while **Significant Data Fiduciaries** have higher obligations.
 - Digital platforms with a large number of users such as **Facebook, Instagram, YouTube, Amazon,**

Flipkart, Netflix, etc, will qualify as significant data fiduciaries.

- **Consent Managers:** The digital platform may also collect consent through **consent managers**.
 - A Consent Manager handles the **collection, storage, and use of user consent**, mainly for data privacy and digital interactions.
 - Consent Manager must be a **company incorporated in India** with sound **financial and operational capacity**, having a minimum net worth of **two crore rupees**.
- **DPBI:** Draft rules have spelt out a framework for setting up the **DPBI** that will have **civil court powers** for personal data breach complaints.

Note: In **2011**, the Justice **AP Shah Committee** recommended privacy legislation, and in **2017**, the Supreme Court, in the case of **Justice KS Puttaswamy (Retd) vs Union of India**, recognized **privacy as a fundamental right**.

What are the Salient Features of the DPDP Act, 2023?

- **Right to Data Protection:** Empowers individuals to control their **personal data**, including **rights to access, correction, and erasure**.
- **Data Processing and Consent:** Requires **explicit consent** for data processing, with clear consent forms.
- **Data Localisation:** Sensitive data must be stored and processed **within India for security and enforcement**.
- **Regulatory Authority:** Establishes the **DPBI** for compliance and grievance handling.
- **Data Breach Notification:** Organisations must notify individuals and the **DPBI of data breaches**.
- **Fines and Penalties:** Strict **penalties for non-compliance** to enforce data protection standards.

Supreme Court Calls for Legislative Reviews

Why in News?

Recently, the **Supreme Court (SC)**, while hearing a plea regarding the 45-day limitation under **Section 81** of the **Representation of the People Act, 1951**, emphasized

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the necessity of **periodic legislative reviews to assess the effectiveness of laws.**

- It highlighted the **need for an expert mechanism to evaluate laws and identify deficiencies or bottlenecks**, proposing reviews every 20, 25, or 50 years.

Representation of the People Act, 1951 (RPA 1951)

- **RPA 1951** aims to **regulate the electoral system** at both the national and state levels.
- **Key Provisions of RPA Act:**
 - It outlines the allocation of seats for the **Lok Sabha, State Legislative Assemblies, and State Legislative Councils.**
 - The Act governs the **delimitation of constituencies** for the purpose of elections.
 - It specifies the **qualifications and disqualifications for voters** and provides the framework for the **preparation of electoral rolls.**
- **Section 81 of the Act 1951** stipulates that an **election petition** challenging the result must be filed within **45 days** from the declaration of results.
 - It can be based on grounds such as **illegal practices, corruption, or electoral law violations** and must be filed in the **High Court** with jurisdiction over the election area.

Why is there a Need for Periodic Review of Laws by the Legislature?

- **Identifying Deficiencies:** Since **laws may lose relevance over time due to evolving circumstances**, regular reviews are essential to ensure **they serve their intended purpose** and allow for necessary modifications or repeal.
 - **Example:** The **IT Act, 2000**, underwent amendments to address **cybercrimes** that were not prevalent earlier.
- **Ensuring Relevance of Legislation:** Periodic reviews ensure that law remains relevant, effective, and aligned with societal needs. They also **address laws enacted hastily or driven by political motives**, ensuring a **focus on legal efficacy and public interest.**
 - **Example:** Enactment of **Anti-liquor law in Bihar** led to a surge in bail applications and strained the state's judiciary.

- Similarly, **Rajasthan's law** authorizing civil society organizations to raid institutions to prevent cow slaughter raised concerns about the **potential misuse of power and violation of institutional integrity.**

- **Addressing Unintended Consequences:** Periodic reviews can identify areas where **laws inadvertently hinder justice or create inefficiencies.**
 - For instance, **Section 81 of RPA, 1951's** 45-day limit may preclude valid election disputes due to procedural constraints.
- **Improving Accountability:** Regular reviews ensure that **laws remain aligned with their original objectives** and democratic principles.
 - For instance, **Section 498A of the IPC**, originally intended to **protect women from cruelty** and harassment by their husbands or in-laws, has been **criticized for misuse.**
- **Global Standards:** Many democratic nations **conduct routine legislative reviews** to ensure laws align with international best practices and human rights norms.
 - For example, the **US PATRIOT Act** has been **periodically amended** to address concerns over privacy and civil liberties.

Periodic Revision of Laws in Other Democratic Countries

- **United Kingdom:** The **Law Commission of England and Wales** is tasked with conducting regular reviews of existing laws.
 - Its recommendations have led to significant legal reforms, such as the **repeal of the Witchcraft Act, 1735**, demonstrating its role in modernizing archaic laws.
- **Australia:** The Australian Law Reform Commission regularly conducts **systematic reviews of the legal framework and submits detailed reports** with recommendations for legislative amendments.
 - This process ensures that laws remain relevant and effective in addressing contemporary issues.

What are the Challenges in Periodically Reviewing Laws?

- **Lack of Political Will:** Legislative reviews are sometimes **influenced by political agendas**, leading to biased

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amendments, which might **serve electoral interests rather than public welfare**, undermining the objectivity of the review process.

- **Example:** Farm Laws (2020) were criticized for **favoring corporate interests over the concerns of farmers** rather than reforming India's agricultural market to address root causes of distress.
- **Judicial Overreach:**
 - Sometimes, the judiciary may be accused of overstepping its boundaries while reviewing laws and affecting the smooth functioning of the review process.
 - **Example:** in the National Judicial Appointments Commission (NJAC) case (2015), where the **Supreme Court** struck down the **NJAC Act**, which aimed to reform judicial appointments by including the executive.
- **Legal Complexity:**
 - Many laws are **interdependent**, and **isolated amendments can lead to unintended consequences or conflicts** with existing legislation, complicating the review process.
 - **Example:** **Anomalies in the legal provisions** related to child pornography under the POCSO Act and the IPC.
- **Limited Public Participation:**
 - Public understanding of legislative processes and legal nuances is **low** and often not encouraging which limits and reduces the impact of the review process.
 - **Example:** The Ranbir Singh Committee to Reforms Criminal Laws had very **limited public participation** in the consultation process for legal reforms, which raised concerns about inclusivity and comprehensiveness of the reforms.

Institutions Related to Legal Reform in India

- Administrative Reforms Commission (ARC)
- **National Commission to Review the Working of the Constitution** (NCRWC) chaired by Justice M.N. Venkatachaliah
- Committee for Reforms in Criminal Laws (2020) under Dr. Ranbir Singh.
- Law Commission of India

Law Commission of India

- It is a **non-statutory advisory body** to research and recommend legal reforms.
- It operates for a **fixed tenure**, advising the government on legal matters.
- The first Law Commission was created in **1834** under the Charter Act of 1833, chaired by **Lord Macaulay**, which recommended the codification of the Indian Penal Code (IPC) and the Criminal Procedure Code (CrPC).
- The first Law Commission of Independent India was set up in **1955**, with **M.C. Setalvad** as Chairman.
- In September 2024, 23rd Law Commission was constituted for a three-year term, from 1st September 2024 to 31st August 2027.
- It **reviews and recommends** the repeal of outdated laws, proposes new legislation to implement the Directive Principles of State Policy, and **addresses judicial administration issues**, offering recommendations to the government.

Prioritising Oil Palm Plantation

Why in News?

Recently, the **Ministry of Agriculture** urged state governments to **prioritise oil palm plantation** targets under the National Mission on Edible Oils - Oil Palm (NMEO-OP) scheme.

What are the Key Facts

Regarding NMEO-OP Scheme?

- **About:** NMEO-OP is a **centrally sponsored scheme** to enhance domestic production of **crude palm oil (CPO)**, thereby reducing the country's dependence on imports.
- **Objectives:**
 - **Area Expansion:** Cover an **additional 6.5 lakh hectares** of oil palm area by **2025-26**, increasing the total cultivated area to **10 lakh hectares**.
 - **Production Targets:** Increase CPO production from **0.27 lakh tonnes (2019-20)** to **11.20 lakh**

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tonnes (2025-26) and further to 28 lakh tonnes by 2029-30.

- **Per-Capita Consumption:** Maintain consumption level of 19 kg/person/annum till 2025-26.
- **Focus Regions:** Special focus is given to the **North-East region** and the **Andaman and Nicobar Islands** to boost oil palm cultivation and CPO production.
- **Key Features:**
 - **Price Assurance:** It introduces **Viability Price (VP) mechanism** to protect farmers from international price fluctuations.
 - The viability funding will be **paid directly** to the farmers accounts in the form of **DBT**.
 - **Enhanced Assistance:** Increase in assistance for planting material from **Rs 12,000/ha to Rs 29,000/ha**.
 - Special assistance of **Rs 250 per plant** for rejuvenating old gardens.
 - **Special Provisions for North-East and Andaman:** Additional **2% of the CPO price** will be borne by the government to ensure **parity** in farmer payments across regions.
 - Special provisions are being made for **half moon terrace cultivation**, **bio fencing** and **land clearance** along with **integrated farming**.

Note:

- Half-moon terracing is a **soil rearrangement technique** that involves building **semicircular embankments** to collect and concentrate water runoff for plant growth.
- **Bio fencing** means planting lines of **trees on the farm and field boundaries** that give protection against **cattle and wildlife**, act as **windbreaks**, enrich the soil, and **control dust**.

Oil Palm

- **Origin and Yield:** It originated in the **tropical rain forest** region of **West Africa**. It is a **comparatively new crop in India** but has the **highest vegetable oil-yielding capability per hectare**.
 - Oil yield from oil palm is **five times higher** than that of traditional oilseeds.

- **Types:** It produces two types of oil.
 - **Palm Oil:** Derived from the **mesocarp** of the fruit (45-55% oil content).
 - **Palm Kernel Oil:** Obtained from the **kernel**, a source of lauric oils.
- **Oil Palm Cultivation:**
 - **Major States:** **Andhra Pradesh**, **Telangana**, and **Kerala** (98% of total production).
 - **Other Key States:** **Karnataka**, **Tamil Nadu**, **Odisha**, **Gujarat**, **Mizoram**, **Arunachal Pradesh**, **Assam**, **Manipur**, and **Nagaland**.
- **Potential:** India has a total potential area of around **28 lakh hectares (ha)** but **only 3.70 lakh hectares** is under oil palm cultivation.
- **Imports:** India is the **world's largest palm oil importer** with palm oil imports of **9.2 million tonnes** in 2023-24.
 - **60% of total edible oil imports** consist of palm oil.
 - India buys palm oil mainly from **Indonesia**, **Malaysia** and **Thailand**.

10 Years of UJALA and SLNP

Why in News?

The **Unnat Jyoti by Affordable LEDs for All (UJALA) scheme**, launched on 5th January 2015, marks its 10th anniversary as a transformative initiative in energy efficiency.

- UJALA has revolutionized household lighting, reduced energy consumption, and contributed to India's environmental sustainability goals.
- The **Street Lighting National Programme (SLNP)**, launched with UJALA, aims to replace conventional streetlights with energy-efficient **Light Emitting Diodes (LEDs)**.

What are the Key Facts About UJALA Scheme?

- **About:** UJALA Scheme launched in January 2015, to promote energy efficiency by replacing **traditional lighting systems (incandescent lamps (ICLs) and Compact Fluorescent Lamps (CFLs))** with **energy-saving LED bulbs**.
 - The scheme is a joint project between the Government of India's Public Sector Undertakings,

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the Union Ministry of Power's **Energy Efficiency Services Limited (EESL)**, and **DISCOMs (Distribution Companies)**.

- **Objective:** The UJALA Scheme aims to save **85 lakh kWh of electricity** and reduce 15,000 tonnes of **Carbon dioxide (CO₂)** by replacing **77 crore traditional bulbs** and 3.5 crore street lights with LEDs.
- **Need for UJALA:** Lighting accounts for approximately 18-27% of residential electricity use in India.
 - In 2011, Indian households used about **one billion lighting points, with most relying on CFLs (46%)** and tube lights (41%). **Only 0.4% used LED bulbs.**
- **Efficiency of LEDs:** LEDs save up to **90% energy compared to ICLs** and 50% compared to CFLs.
 - LED bulbs use **75% less energy and last 25 times longer than incandescent bulbs**, but the high upfront cost was a major barrier.
- **Key Features of UJALA:**
 - **Subsidized LED Bulbs:** The cost of LED bulbs distributed under UJALA was reduced to Rs 70 per LED bulb, compared to Rs 450 in 2014.
 - **Distribution Mechanism:** The bulbs are distributed via a **demand aggregation-price crash model** (Bulk buying to reduce prices).
 - In 2015, EESL invited open bids for large-scale LED lamp procurement and engaged state governments to establish a distribution network.
- **Progress and Achievements:** Over 36.87 crore LED bulbs have been distributed across the country, leading to:
 - **Energy Savings:** 47,883 million kWh of energy saved annually.
 - **Cost Savings:** Rs. 19,153 crore saved annually.
 - **CO₂ Reduction:** 3.88 million tonnes of CO₂ avoided annually.
 - **Peak Demand Avoided:** 9,586 MW peak demand has been avoided.

Note:

- **GRAM UJALA Scheme** was Introduced in March 2021 for rural households, offering LED bulbs at Rs. 10 each in exchange for old incandescent bulbs.
 - Under **Phase-I**, the goal was to distribute **1.5 crore LED bulbs**, achieving energy savings of 2025 million kWh/year and CO₂ reduction of 1.65 million tonnes per year.

What are the Key Facts About Street Lighting National Programme?

- **About:** The SLNP, key objectives include **reducing energy consumption, lowering operational costs** for municipalities, and fostering a market transformation towards energy-efficient appliances.
- **Implementing Agency:** EESL was appointed as the implementing agency, collaborating with **Urban Local Bodies (ULBs)**, Municipal Bodies, **Gram Panchayats (GPs)**, and both Central and State Governments to execute the program across the country.
- **Business Model:** The SLNP introduced a unique model where EESL covers initial costs, recovering the investment through **monthly or quarterly payments from municipalities**.
 - EESL also ensures **95% uptime for LED streetlights**, enhancing public safety and providing reliable services without straining local budgets.
- **Achievements:**



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What are the Key Differences between ICLs, CFLs and LEDs?

Feature	Incandescent Lamps (ICLs)	Compact Fluorescent Lamps (CFLs)	LEDs (Light Emitting Diodes)
Energy Efficiency	Low	Moderate	High
Power Consumption	High	Moderate	Low
Cost of Bulb	Low (initial cost)	Moderate	High (initial cost)
Heat Emission	High	Moderate	Very low
Environmental Impact	High (produces more CO ₂ due to energy waste)	Moderate (contains small amounts of mercury)	Low (no harmful emissions)
Color Options	Warm white	Cool white, Warm white	Warm white, Cool white, RGB
Durability	Fragile	More durable than ICLs	Very durable, impact-resistant
Light Direction	Omnidirectional	Omnidirectional	Directional or omnidirectional
Chemical Composition	Tungsten filament, inert gas (argon or nitrogen)	Mercury vapor, phosphor coating	Gallium nitride (GaN), indium gallium nitride (InGaN), phosphorus (for color)

Energy Efficiency Services Limited (EESL)

- EESL, founded in 2009 and promoted by the **Ministry of Power**, is a **Super Energy Service Company (ESCO)** that focuses on energy efficiency solutions.
 - EESL implements the **world's largest energy efficiency portfolio** across sectors like lighting, buildings, electric mobility, smart metering, and agriculture.
- EESL has saved over **47 billion kWh of energy annually** and reduced carbon emissions by **36.5 million tonnes**.
 - EESL operates as a joint venture of **National Thermal Power Corporation Limited**, **Power Finance Corporation Limited**, **REC Limited** and **POWERGRID Corporation of India Limited**.

India's Other Initiatives Related to Energy Efficiency

- **Standards and Labeling (Bureau of Energy Efficiency (BEE))**
- **The Energy Conservation (Amendment) Act, 2022**
- **National Mission for Enhanced Energy Efficiency (NMEEE)**
- **National Electric Mobility Mission Plan (NEMMP)**
- **Perform Achieve and Trade Scheme (PAT)**
- **Energy Conservation Building Code (ECBC)**

CBI Exempt from State Consent for Central Employees

Why in News?

Recently, the **Supreme Court (SC)** ruled that **CBI** can register cases under **Central laws**, like the **Prevention of Corruption Act, 1988** against **Central government employees in states without state consent**.

- The SC overturned an **Andhra Pradesh High Court** ruling that **quashed two FIRs** against Central government employees due to the **lack of Telangana's consent to prosecute them**.

What is State Consent for CBI?

- **About:** It refers to the requirement for the **CBI to obtain permission** from a state government before investigating cases within that state's territorial jurisdiction.
 - It stems from the **federal structure** of the Indian Constitution, which delineates the **powers of the central and state governments**.
- **Legal Basis:** **Section 6 of the Delhi Special Police Establishment (DSPE) Act, 1946** requires **CBI to obtain**

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state consent for investigations unless directed by the judiciary or central government for specific purposes.

➤ **Types of Consent:**

- **General Consent:** States grant **blanket permission** for the CBI to operate within their jurisdiction without seeking case-specific approval.
- **Specific Consent:** When general consent is not granted, the CBI must seek **case-specific permission** from the state government.

What is CBI?

- **About:** The CBI was established in **1963** by a resolution of the **Ministry of Home Affairs** following recommendations by the **Santhanam Committee on Prevention of Corruption (1962–1964)**.
 - It acts as the **nodal police agency** for coordinating investigations with **Interpol** member countries.
- **Functioning:** It derives its investigative powers from the **Delhi Special Police Establishment Act, 1946**.
 - It operates under the **Ministry of Personnel, Public Grievances, and Pensions**, which falls under the Prime Minister's Office.
- **Supervision Over CBI:** The **Central Vigilance Commission (CVC)** oversees the CBI's supervision in investigating offences under the **Prevention of Corruption Act, 1988**.
 - In other matters, it lies with the **Department of Personnel & Training (DOPT)** in the Ministry of Personnel, Pension & Grievances of the Government of India.
- **Appointment of CBI Director:** Under the **Lokpal Act, 2014**, a committee comprising the **Prime Minister, Leader of the Opposition, and Chief Justice of India** (or a Supreme Court Judge) recommends the appointment.
 - The Director enjoys a tenure security of **2 years, extendable up to 5 years** in the public interest.

Arunachal Pradesh Freedom of Religion Act, 1978

Why in News?

The **Arunachal Pradesh** government is taking steps to implement the **Arunachal Pradesh Freedom of Religion**

Act, 1978, by framing rules for its enforcement, nearly 46 years after its enactment.

- The move aims to address concerns related to **forceful conversions in the state**.

What is the Arunachal Pradesh Freedom of Religion Act of 1978 ?

➤ **About:**

- The **Arunachal Pradesh Freedom of Religion Act, 1978** was introduced to prohibit forceful religious conversions.
- The Act was introduced (in 1978) during a period of **rapid social and cultural changes** in Arunachal Pradesh, aiming to **safeguard the traditional religious practices** of indigenous communities from external influence or coercion.

➤ **Key Provisions:**

- **Definition of Indigenous Faiths:** The Act explicitly recognizes indigenous faiths as **religions, beliefs, customs**, and observances practiced by the native communities of Arunachal Pradesh. These include:
 - **Buddhism:** As practiced among the tribal groups such as **Monpas, Membas**, Sherdukpens, Khambas, Khamptis, and Singphos.
 - **Nature Worship:** Particularly the worship of **Donyi-Polo** (means "Sun and Moon") practiced by several communities in the state.
 - **Donyi-Polo** is an indigenous religion of the Tani and other Sino-Tibetan peoples of Arunachal Pradesh and Assam in Northeast India.
 - **Vaishnavism:** As practiced by the **Noctes and Akas**.
- **Prohibition of Forced Conversion:** The Act specifically **prohibits religious conversion** from one religious faith to another, **against their will or under coercive circumstances**.
- **Punishment for Violation:** The Act prescribes a **punishment of up to 2 years** of imprisonment and a **fine of up to Rs. 10,000** for individuals found guilty of forcibly converting others or attempting to do so.
- **Mandatory Reporting:** The Act mandates that **any act of religious conversion be reported to**

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the Deputy Commissioner (DC) of the respective district.

➤ Push for Revival:

- The Act's revival gained momentum after a **Public Interest Litigation (PIL)** in 2022 led to the Gauhati High Court's intervention, prompting the state government to **finalize the necessary rules for its implementation**.
- It has also been supported by organizations like the **Indigenous Faiths and Cultural Society of Arunachal Pradesh (IFCSAP)** which aims to protect indigenous beliefs, especially as some districts which have seen **conversion rates as high as 90%**.
 - The **Christian population in Arunachal Pradesh** increased from **0.79% in 1971 to 30.26% in 2011**.

Constitutional Provisions Related to Religious Belief

- **Article 25:** **Article 25** ensures the **freedom of conscience and the right to profess, practice, and propagate religion**, subject to **public order, morality, and health**.
 - It permits the **state to regulate secular activities** related to **religious practice** and mandates the opening of Hindu religious institutions to all Hindus, irrespective of their caste or class.
- **Article 26:** **Article 26** grants every **religious denomination the right to manage its religious affairs**, subject to considerations of public order, morality, and health.
- **Articles 27-30:** Safeguard the **freedom to contribute financially to religious practices, manage religious affairs, and establish and administer educational institutions** for religious purposes.

State-Level Anti-Conversion Laws

- **Odisha (1967):** It became the **first state to pass a law restricting religious conversions**, prohibiting conversions through force or fraudulent means.
- **Madhya Pradesh (1968):** Introduced the **Madhya Pradesh Dharma Swatantraya Adhiniyam**, mandating that any conversion activities be reported to the District Magistrate, with penalties for non-compliance.

- **Other States:** Several other states, including Gujarat (2003), Chhattisgarh (2000 and 2006), Rajasthan (2006 and 2008), Himachal Pradesh (2006 and 2019), Tamil Nadu (2002-2004), Jharkhand (2017), Uttarakhand (2018), Uttar Pradesh (2021), and Haryana (2022), have enacted similar laws prohibiting various forms of religious conversions.
 - These laws often impose **stricter penalties for conversions** involving **Scheduled Castes (SCs), Scheduled Tribes (STs), minors, and women**.

Third-Party Audits for Smart Cities Mission

Why in News?

Recently, a **Parliamentary Standing Committee** on housing and urban affairs has called for **third-party assessments** of projects under the **Smart Cities Mission (SCM)**.

- This is aimed at **addressing gaps in implementation**, especially in smaller cities.

Parliamentary Standing Committee:

- **About:**
 - The **Standing Committees** are permanent (constituted every year or periodically) and work on a continuous basis.
- **Types of Committees:**
 - Based on their functions, membership, and tenure, committees are classified into two types: **Standing Committees** and **Ad Hoc Committees**.
 - **Standing Committees are categorized into 6 types:**
 - Financial Committees
 - **Departmental Standing Committees**
 - Committees to Enquire
 - Committees to Scrutinise and Control
 - Committees Relating to the Day-to-Day Business of the House
 - House-Keeping Committees or Service Committees

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Note:

- **Ad Hoc Committees** are temporary in nature and are dissolved upon completing their assigned tasks. These are further divided into:
 - Inquiry Committees
 - Advisory Committees

What is the Need of a Third-Party Audit for the SCM?

- **Assessment and Transparency:** Third-party evaluations offer an **unbiased analysis of project** progress and impact under the SCM, helping to **identify implementation gaps and areas for improvement**.
 - They also **enhance transparency, fostering trust** among stakeholders, including citizens, government bodies, and investors.
- **Evidence-Based Policy:** It can explore how the expertise of **Special Purpose Vehicles (SPVs)** in urban development can be applied to other initiatives like **AMRUT** and **DAY-NULM**, enhancing the broader impact of urban transformation programs.
- **Addressing Disparities:** Larger cities perform well due to better resources, while **smaller cities, especially in the northeast, face challenges** in project execution, so independent audits can **highlight these disparities and suggest improvements**.
 - Also, the third-party assessments can **tailor strategies for tier 2 cities, promoting balanced development and decongesting metropolitan areas**.
- **Strengthening Urban Local Bodies (ULBs):** Many **ULBs** lack the technical and financial capacity to manage large-scale projects under SCM.
 - Third-party assessments can **identify best practices to enhance urban planning and governance** while providing **data-driven insights for informed policymaking and efficient resource allocation**.
- **Future Planning and Sustainability:** It will provide valuable insights for **planning future phases of the SCM**, ensuring **sustainability and alignment** with urban growth needs.
 - They also contribute to a **more integrated approach to urban development**, considering economic, social, and environmental factors.

What is the Smart Cities Mission (SCM)?

- **About:** SCM is a **Centrally Sponsored Scheme** launched in **June 2015** with the aim to **transform 100 cities** of India by providing them with necessary **core infrastructure**.
 - **Additionally, to provide a clean and sustainable environment** in cities to enable a decent quality of life to their citizens through the application of **“Smart Solutions”**.
- **Objectives:**
 - **Promote efficient use of resources**, green spaces, and environmental sustainability. Ensure access to clean water, electricity, sanitation, healthcare, and public amenities.
 - Enhance **governance through digital platforms**, e-governance, and citizen participation. Provide affordable housing solutions, especially for economically weaker sections.
 - Improve public transport systems and **reduce congestion** with smart traffic management.
 - Ensure the **safety of citizens, particularly vulnerable groups**, through surveillance and emergency services. Create robust IT infrastructure for seamless access to services and information.
 - Develop **model cities to showcase best practices** for other cities to replicate.
- **Key Components:**
 - **Area-Based Development:**
 - **Redevelopment:** Upgrading existing urban areas with enhanced infrastructure (e.g., Bhendi Bazaar, Mumbai).
 - **Retrofitting:** Modernizing infrastructure in existing localities (e.g., Ahmedabad's Local Area Development).
 - **Greenfield Development:** Building new, sustainable urban spaces (e.g., New Town Kolkata, GIFT City).
 - **Pan-City Solutions:**
 - Adoption of **Information and Communication Technology (ICT)** solutions across sectors like **e-governance**, waste and water management, urban mobility, and energy efficiency.

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Note:

- **Governance Structure:** Implementation through **Special Purpose Vehicles (SPVs)** established under the **Companies Act, 2013**, led by bureaucrats or industry representatives.
 - Emphasis on a **Public-Private Partnership (PPP) model** for funding.

Note: Key Developments Under SCM

- **Projects Completed:**
 - Initially set for completion by 2020, the SCM deadline was extended to **March 2025**.
 - As of 3rd July 2024, out of **8,000+ multi-sectoral projects** worth Rs 1.6 lakh crore, **7,188 projects (90%)** amounting to Rs 1,44,237 crore have been completed.
 - The **remaining 830 projects** worth Rs 19,926 crore are in **advanced stages of implementation**.
- **Financial Progress:**
 - The Government of India allocated Rs 48,000 crore, of which Rs 46,585 crore **(97%) has been released to the cities**.
 - **93%** of the released funds have been utilized.
 - **74 cities** have received full financial support under the mission.

What are the Challenges in Implementing SCM Projects?

- **Cost and Funding:** The development of smart city infrastructure requires **significant investment** in upgrading existing systems, deploying sensors, and maintaining networks.
 - While 74 cities have received 100% of their central share, **26 cities are yet to get the full funding** due to the slow progress of projects.
- **Displacement and Social Impact:** According to the **World Bank**, in urban areas of India more than **49% of the population live in slums**.
 - The execution of smart city projects **has led to the displacement of residents in poorer areas, such as street vendors**, disrupting the fabric of urban communities.
- **Delay in Project Completion:** Despite the extension of the deadline, a significant number of projects **(around 10%) are still incomplete**, indicating delays in execution.

- This can be attributed to factors such as **inadequate planning, lack of technical expertise**, and **issues in land acquisition and clearances**.
- **Privacy and Data Security:** The collection and analysis of vast amounts of data from sensors, devices, and citizens raise concerns about **data breaches, unauthorized access, and misuse**.
 - Ensuring robust **cybersecurity, safeguarding privacy, and implementing clear data governance policies** are essential for building public trust.
- **Lack of Coordination:** Effective coordination between the central, state, and local governments has been a challenge due to **differences in priorities, bureaucratic hurdles, and lack of clarity in roles and responsibilities** that have hindered the seamless implementation of the mission.
- **Sustainability Concerns:** There are doubts about the **long-term sustainability** of the smart city projects, as many of them focus on **technology-driven solutions** rather than addressing the **fundamental issues of urban planning and governance**.
 - The SCM acknowledges the **absence of a universal definition for smart city**.

What are the Other Government Initiatives Related to Urban Development?

- **Atal Mission for Urban Rejuvenation and Urban Transformation (AMRUT)**
- **Pradhan Mantri Awas Yojana-Urban (PMAY-U)**
- **Climate Smart Cities Assessment Framework 2.0.**
- **TULIP-The Urban Learning Internship Program.**

PMAY-G and Rural Poverty Alleviation in India

Why in News?

The **Ministry of Rural Development** highlighted the progress of the **Pradhan Mantri Awas Yojana-Gramin (PMAY-G)** and emphasized intensifying efforts to create **poverty-free villages**.

- By ensuring the timely and effective implementation of rural development schemes, the ministry aims to achieve poverty-free India.

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Note:

What are the Key Facts About PMAY-G?

- **About:** Introduced in **2016** to provide affordable housing for the rural poor. Beneficiaries are Selected based on **Socio-Economic Caste Census (SECC) 2011** data, validated through **Gram Sabha approvals** and **geo-tagging**.
- **Benefits Under PMAY-G:**
 - **Financial Assistance:** Beneficiaries are given Rs 1.20 lakh in plain areas and Rs 1.30 lakh in 2 Hill States (Himachal Pradesh and Uttarakhand), North-Eastern Region, and Union Territories(UT) of Jammu and Kashmir and Ladakh.
 - Cost Sharing patterns include **60:40** (Centre: State) in plain areas and **90:10**(Centre: State) in northeastern, Himalayan states (Himachal Pradesh and Uttarakhand), and UT of Jammu and Kashmir. **100% Centre-funded** in UT Ladakh.
 - **Toilet Support:** Rs 12,000 for toilet construction via **Swachh Bharat Mission Grameen (SBM-G)**.
 - **Cooking Fuel:** In convergence with **Pradhan Mantri Ujjwala Yojana**, one LPG connection per house is provided.
 - **Employment Support:** 90/95 person-days of unskilled work under **Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)** for house construction.
- **Earmarking of Targets:** The scheme reserves 60% of targets for **Scheduled Castes (SC)** and **Scheduled Tribes (ST)** households, with 59.58 lakh SC and 58.57 lakh ST houses completed.
- **Extension of the Scheme:** The scheme, initially targeting **2.95 crore houses by 2023-24**, has been extended to include **2 crore more houses** with a total outlay of Rs 3,06,137 crore for FY 2024-29.
- **Achievements of PMAY-G:** As of November 2024, **3.21 crore houses have been sanctioned**, and **2.67 crore houses have been completed**.
 - 4.19 lakh houses, including 71,000 under **Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM-**

JANMAN), have been completed between June and December 2024.

- **Mobile Applications: Awas Plus-2024 App** launched to streamline beneficiary identification.
 - **Awas Sakhi App** introduced to enhance transparency and monitoring.

Poverty

- **About:** According to the **World Bank**, Poverty is the lack of sufficient income or resources to meet basic needs. It can manifest as **deprivation in areas like housing, food, or health**.
 - The broadest view of poverty focuses on an **individual's ability to function in society, encompassing lack of income, education, health, power, and political freedoms**.
 - The World Bank adopted **USD 2.15** as the international poverty line using the **2017 Purchasing Power Parity (PPP)**, up from USD 1.90 set in the 2015 update using the 2011 PPP.
- **Absolute Poverty:** A condition where individuals lack the resources to meet basic needs like food, shelter, and healthcare, typically measured by the poverty line.
- **Relative Poverty:** Poverty defined by an individual's standard of living compared to others in society, highlighting economic inequality.
- **Poverty Statistics in India:** **National Family Health Survey-5 (2019-21)** data shows that **14.96% of India's population** is multidimensionally poor, down from **24.85% in NFHS-4 (2015-16)**, with **135 million people escaping poverty**.
 - The **Multidimensional Poverty Index (MPI)** has decreased from 29.17% in 2013-14 to 11.28% in 2022-23, indicating a 17.89% point reduction.
 - The **Household Consumption Expenditure Survey (HCES)** reveals that **rural poverty dropped to 7.2% in 2022-23** from 25.7% in 2011-12, while **urban poverty fell to 4.6% from 13.7% in the same period**.

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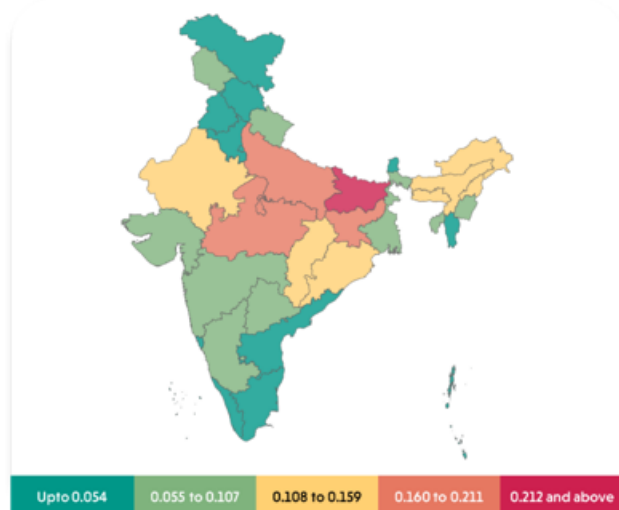
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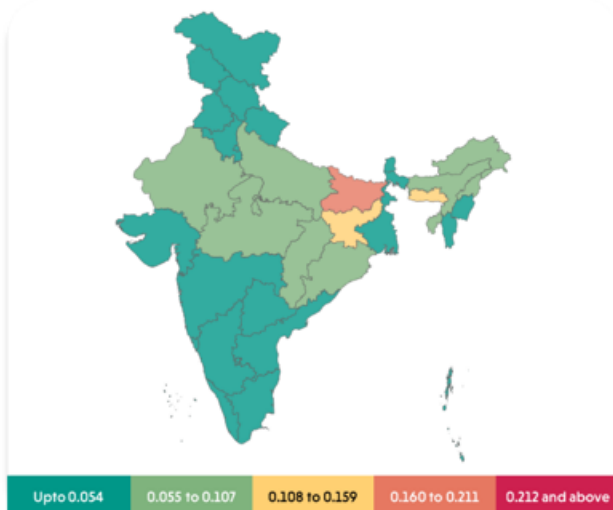
Note:

Comparative view of the Multidimensional Poverty Index Score (State/UT-wise)

NFHS-4 (2015-16)



NFHS-5 (2019-21)



The colour represents the MPI score of a state. The colour moves from green, through yellow, to red as the MPI score increases. Green represents areas with the lowest MPI scores while red represents areas with the highest MPI scores. The legend shows the range of MPI scores in India, based on the values for 2015-16. Both the comparative maps use the same legend to represent the change in MPI scores between 2015-16 to 2019-21.

What are the Other Schemes that Contribute to Poverty-Alleviation in Villages?

- **Infrastructure:**
 - [Pradhan Mantri Gram Sadak Yojana\(PMGSY\)](#)
 - [Jal Jeevan Mission](#)
- **Social Protection Schemes:**
 - [National Social Assistance Program \(NSAP\)](#)
 - [Janani Suraksha Yojana](#)
 - [Pradhan Mantri Jan Dhan Yojana](#)
 - [Pradhan Mantri Jeevan Jyoti Bima Yojana](#)
 - [Pradhan Mantri Suraksha Bima Yojana](#)
- **Livelihood Enhancement Schemes:**
 - [MGNREGA Scheme](#)
 - [NRLM \(National Rural Livelihood Mission\)](#)
 - [Pradhan Mantri Kaushal Vikas Yojana \(PMKVY\)](#)
 - [Pradhan Mantri Mudra Yojana](#)
 - [Lakhpati Didi Initiative](#)
- **Health:**
 - [Pradhanmantri Jan Arogya Yojana \(Ayushman Bharat\)](#)
 - [Mission Indradhanush](#)

What are the Challenges in Removing Poverty in Rural India?

- **Dependency on Agriculture:** A large portion of the rural population depends on agriculture, which faces challenges like **climate change**, **erratic monsoons**, and **poor irrigation**.
 - **Low agricultural productivity** and reliance on traditional methods further limit income generation.
- **Unemployment and Underemployment:** There are limited job opportunities outside agriculture, leading to high **unemployment** and **underemployment** rates. This is compounded by a **lack of skills and education**.
- **Limited Access to Services:** Basic services such as education, healthcare, sanitation, and infrastructure are often inadequate.
- **Land Ownership:** Many rural families lack **land ownership** or **secure land rights**, hindering investment in livelihoods.
- **Social Inequality:** Marginalized communities, including women, SCs, and STs, face discrimination and limited access to resources. This perpetuates cycles of poverty.

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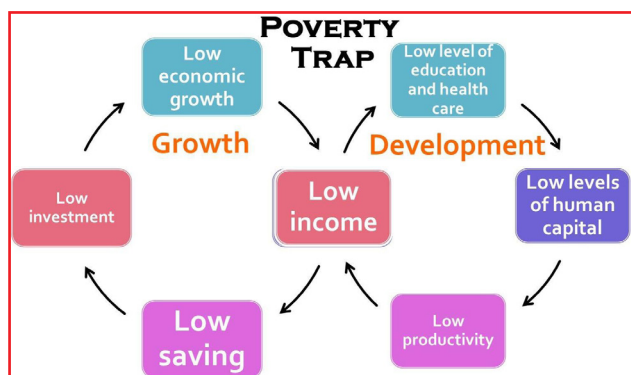


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Note:

- **Migration:** Many young, educated individuals migrate to **urban areas for better opportunities**, leading to a **"brain drain"** in rural regions.
- **Governance Challenges:** The **weak implementation or under-implementation of policies** like the **Operation Greens Scheme, corruption**, inadequate data, and limited public awareness further hinder effective poverty reduction in rural India.
 - A focus on **short-term measures** rather than long-term solutions also impedes progress.



Decline of Private Members' Bills in Indian Parliament

Why in News?

In recent years, **Private Members' Bills**, crucial for **Members of Parliament (MPs) independent expression**, have been sidelined in India's Parliament due to limited time allocation.

- The **17th Lok Sabha (June 2019 to February 2024)** saw a sharp decline in time spent on these bills, raising concerns about the **diminishing role of individual MPs** and the health of **parliamentary democracy**.

What is the Private Members' Bill?

- **About:** Private Members' Bills are proposed by **MPs who are not Ministers** (i.e., not part of the government), allowing them to **introduce laws or amendments** on issues important to their constituencies.
- **Key Features:** Only **non-government MPs** can introduce these bills, offering a chance for **independent legislative proposals**.

- MPs can also introduce resolutions to call attention to **specific matters**.
- **Procedure:**
 - **Drafting and Notice:** MPs draft and submit bills with at least **one month's notice**.
 - **Introduction:** Bills are introduced in Parliament, followed by initial discussions.
 - **Debate:** If selected, bills are debated, typically in limited **Friday afternoon sessions**.
 - **Decision:** Bills may be withdrawn or proceed to a vote.
- **Significance:** These bills provide a platform for MPs to express themselves without **party pressure**, often on crucial or controversial matters.
 - A historical example is the bill introduced by **H.V. Kamath in 1966** after the death of **Prime Minister Lal Bahadur Shastri**, seeking to **amend the Constitution** to make **only Lok Sabha members eligible for the post of Prime Minister**.
 - Only **14 Private Members' Bills** have been passed since independence, and **none have passed since 1970**.
 - The **Rights of Transgender Persons Bill, 2014**, became the first private member's bill approved by the Rajya Sabha in 45 years but lapsed without reaching the Lok Sabha.

Public Bill vs Private Bill

Public Bill	Private Bill
1. It is introduced in the Parliament by a minister.	1. It is introduced by any member of Parliament other than a minister.
2. It reflects of the policies of the government (ruling party).	2. It reflects the stand of opposition party on public matter.
3. It has greater chance to be approved by the Parliament.	3. It has lesser chance to be approved by the Parliament.
4. Its rejection by the House amounts to the expression of want of parliamentary confidence in the government and may lead to its resignation.	4. Its rejection by the House has no implication on the parliamentary confidence in the government or its resignation.
5. Its introduction in the House requires seven days' notice.	5. Its introduction in the House requires one month's notice.
6. It is drafted by the concerned department in consultation with the law department.	6. Its drafting is the responsibility of the member concerned.

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Note:

Why is there a Decline in Private Members' Bills?

- **Lack of Time and Attention:** Data from PRS Legislative Research reveals that the 17th Lok Sabha allocated just **9.08 hours to Private Members' Bills**, while the **Rajya Sabha spent 27.01 hours**, a fraction of total session hours.
 - In the **18th Lok Sabha's two sessions**, only 0.15 hours were spent on such Bills in the Lower House and 0.62 hours in the Rajya Sabha, with minimal time on resolutions.
- **Friday scheduling of Private Members' business** limits discussion as many MPs leave for constituencies, shrinking its window further.
- The decline of these bills can be attributed to MPs' lack of seriousness, with many skipping discussions.
- **Revival of Private Members' Bills:** Shifting Private Members' Bills to **midweek** could boost participation and discussions.
 - Protect the **constitutional space for individual parliamentary expression** and encourage MPs to actively participate in their proposed bills.



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Note:

Economic Scenario

Highlights

- Privatisation of Power DISCOMs
- Future of Jobs Report 2025
- 8th Edition of the National Programme for Organic Production
- Chhattisgarh Links Forest Ecosystem to Green GDP
- Household Consumption Expenditure Survey 2023-24
- SBI Reports Decline in Poverty in India
- LEADS 2024 Report
- Farmer's Demand for Legalizing MSP
- Extension of Crop Insurance Schemes
- India-Latin America Trade Relations
- DILRMP and Digitalisation of Land Records
- Tapping Renewable Energy Potential in India
- India's Journey of Infrastructure Development
- Business Ready (B-READY) Report 2024

Privatisation of Power DISCOMs

Why in News?

In December 2024, the **Supreme Court** upheld the **Punjab and Haryana High Court's** decision, supporting the government's intent to privatize the **power distribution companies (DISCOMs)**, in Chandigarh.

What is the Need for

Privatisation of Power DISCOMs?

- **High AT&C Losses:** Despite improvements, India's **Aggregate technical and commercial (AT&C) losses** remain high at **17.6% in FY24**, showing persistent issues of electricity theft and unbilled supply.
 - These losses undermine the financial health of DISCOMs and limit their ability to invest in infrastructure.
- **Systemic Inefficiencies:** **Billing efficiency** at **87%** and **collection efficiency** at **97.3%** reflect persistent operational inefficiencies.
 - These gaps reduce **revenue generation**, aggravating the financial strain on DISCOMs.
- **Escalating Financial Strain:** The **average cost of supply (ACS)** and the **average realizable revenue (ARR)** gap widened to from 33 paise per unit in FY22 to **55 paise per unit** in FY23.

○ This gap exacerbates their debt, making them reliant on state subsidies.

- **Subsidy Burden on States:** The financial deficit in India's power distribution sector widened to at least **Rs 79,000 crore** in FY23 from **Rs. 44,000 crores** in FY22.
 - This dependency reflects **unsustainable financial management** in the power sector.
- **Rising Power Demand and Costs:** A sharp **8% rise in power demand** in FY23, coupled with dependence on **costly coal imports** and high exchange prices, pushed the **average power purchase cost** up by **71 paise/kWh**.
 - Without structural changes, these rising costs may lead to further financial instability for public-sector DISCOMs.
- **Demonstrated Success in Private Models:** In **Delhi**, privatisation led to a dramatic reduction in AT&C losses from over **50% in 2002 to single-digit levels**, demonstrating the potential for operational turnaround.
 - Due to privatization, the Delhi government saved approximately **Rs. 1,200 crores annually**, which was previously spent on the **Delhi Vidyut Board**.
- **Ineffectiveness of Current Public-Sector Reforms:** Government initiatives like the **UDAY scheme** have shown limited success in curbing losses or improving operational efficiency.
 - Private-sector involvement is seen as necessary to introduce **professional management, modern technologies, and accountability**.

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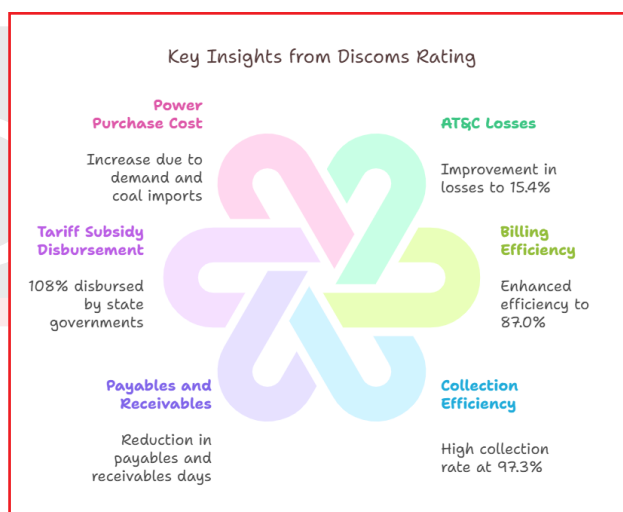
What are Challenges of Privatisation of DISCOMs?

- **Employee Resistance to Privatisation:** Employees of public-sector DISCOMs often oppose privatisation, fearing **job losses, adverse service conditions, and retrenchment**.
 - Experiences like **Delhi's** voluntary retirement scheme highlights employee concerns over job security and finances.
- **Complex Legal and Regulatory Environment:** Challenges arise from complying with the **Electricity Act, 2003**, uncertainty over full privatization, and unclear reform options.
 - For example, in **Chandigarh**, legal challenges raised concerns about whether the private bidder met all statutory requirements, delaying the process.
- **Tariff Concerns for Consumers:** **Post-privatisation, tariff increases** are often necessary to cover operational costs and infrastructure investments, raising fears of consumer backlash.
 - Balancing the need for cost recovery with **affordability** is a critical challenge for regulators and private players.
- **Lack of Transitional Support:** Odisha's privatisation failure in the 1990s is an example where the absence of adequate **financial and operational transitional support** led to poor outcomes.
 - Unlike Odisha, Delhi's success was bolstered by transitional funds of **Rs. 3,450 crores**, which helped DISCOMs manage initial operational hurdles.

What are Government Steps to Support State DISCOMs?

- **Schemes:**
 - **Ujwal DISCOM Assurance Yojana (UDAY):** Launched in 2015 to rescue financially strained DISCOMs, UDAY reduced their debt by allowing states to take over **75% of liabilities** as low-interest bonds.
 - It targeted improved **AT&C losses** and **billing efficiency** through measures like **smart metering** and **theft reduction**.
 - **Revamped Distribution Sector Scheme (RDSS):** Introduced with a budget of **Rs. 3,03,758 crore** for a 5-year period (**FY 2021-22 to FY 2025-26**).

- The scheme aims to reduce **AT&C losses** to **12-15%** nationwide and eliminate the gap between **ACS** and **ARR** by **2024-25**.
- **Integrated Power Development Scheme (IPDS):** Launched to strengthen the urban power distribution infrastructure, **IPDS** focuses on improving **reliability**, **reducing technical losses**, and ensuring better customer service in urban areas.
- **Other Measures:**
 - **Integrated Ratings:** The **Integrated Rating of DISCOMs**, conducted annually, evaluates operational and financial parameters, helping to identify inefficiencies and encourage accountability.
 - The **12th Edition of the Integrated Rating of Discoms** highlighted improvements like reduced AT&C losses and better payment cycles.



- **Financial Assistance and Subsidies:** During FY23, state governments disbursed **108% of tariff subsidies booked**, ensuring that **DISCOMs** could maintain operations despite losses.
 - In cases like Delhi, transitional funding of **Rs. 3,450 crores** was instrumental in stabilizing operations post-privatisation.
- **Regulatory Reforms:** **Late Payment Surcharge Rules** have significantly reduced days payable to **126 days** and days receivable to **119 days**, easing liquidity pressures on **DISCOMs**.
 - These rules incentivize timely payments to generation and transmission companies.

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Note:

- **Privatisation in Union Territories (UTs):** The central government initiated privatisation of UT DISCOMs, with **Dadra and Nagar Haveli** and **Daman and Diu** being the first success stories in 2022.
- Progress in **Chandigarh and Puducherry** demonstrates ongoing efforts, despite resistance and litigation.

Future of Jobs Report 2025

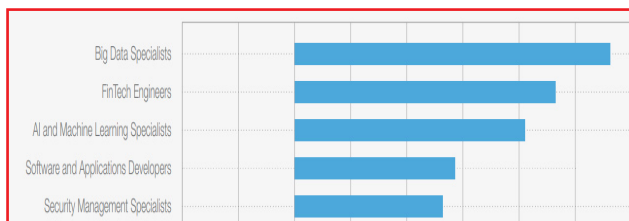
Why in News?

The **World Economic Forum (WEF)** released its '**Future of Jobs Report 2025**,' highlighting **key findings and changes** expected to **shape the global job market by 2030**.

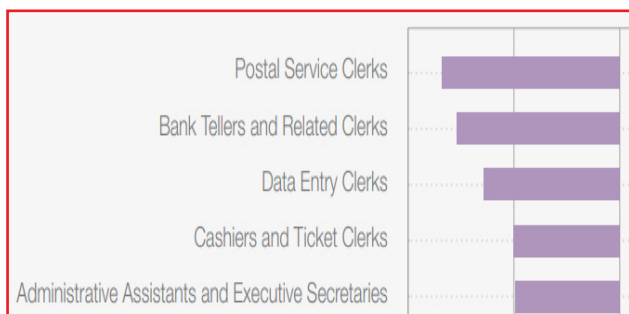
- The report, based on inputs from **55 economies**, **projected** a net increase of **78 million jobs by 2030** and highlighted how **technology, economic shifts, and the green transition** impact jobs and skills.

What Are the Key Findings of the WEF Report?

- **Fastest-Growing Roles:** The fastest-growing roles include frontline jobs (farmworkers, delivery), care economy positions, tech roles, and green transition jobs.



- **Declining Roles:** The report finds that clerical roles such as cashiers, data entry clerks, and bank tellers are expected to decline significantly.



- **Job Displacement and Creation:** Automation, investments in **renewable energy** and **aging populations** displaces jobs but creates **new tech and machine management roles**.
 - Slower economic growth is expected to **displace 1.6 million jobs globally**.
- **Technological Advancements:** Broadening **digital access** is the most transformative trend, with **60% of employers** expecting it to **reshape businesses by 2030**.
 - Key technologies in demand for high skills include **Artificial intelligence (AI)** and information processing (86%), robotics and automation (58%), and energy technologies (41%).
- **Green Transition:** **Climate-change** mitigation and adaptation trends are driving demand for roles such as **renewable energy engineers, environmental engineers, and specialists in electric and autonomous vehicles**.
- **Demographic Shift:** Aging populations and shrinking workforces impact labor supply.
 - Aging in **high-income economies** drives demand for **healthcare**, while growing workforces in **low-income economies** boost demand for **educators and talent managers**.
- **Geoeconomic Fragmentation:** Geopolitical tensions and trade restrictions are prompting business model transformations in **34% of organizations**.
 - Businesses are more likely to **offshore and reshore their operations**.
 - Geopolitical tensions are boosting demand for **security roles and cybersecurity skills**.
- **India Related Findings:** India is leading in AI skills enrollments with corporate sponsorship significantly boosting **GenAI training**.
 - Employers in India aim to outpace global tech adoption, with 35% expecting **semiconductors** and computing technologies, and 21% anticipating **quantum and encryption** to transform operations.
 - **India and Sub-Saharan African nations**, will supply nearly **two-thirds** of new workforce entrants in the coming years.

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Note:

World Economic Forum (WEF)

- **About:** WEF is an international organization for **public-private cooperation**, headquartered in Geneva, Switzerland.
 - It engages global leaders to shape agendas across industries, regions, and globally.
- **Foundation:** Founded by Klaus Schwab in 1971 as the **European Management Forum**, WEF introduced "**stakeholder capitalism**," which emphasizes **long-term value** for all stakeholders, not just short-term profits for shareholders.
- **Evolution:** In 1973, the WEF expanded its focus to **economic and social issues**. It introduced membership for the world's leading **1,000 companies** in 1975.
 - In 1987, it became the **World Economic Forum**, broadening its role as a platform for dialogue. It was recognized as an **international organization** in 2015.
- **Major Reports:** WEF publishes key reports, including the **Global Competitiveness Index**, **Global Gender Gap Index**, **Energy Transition Index**, **Global Risk Report**, and **Global Travel and Tourism Competitiveness Index**.

What are the Challenges to Employment in India due to Emerging Technologies?

- **Job Displacement:** According to the **International Labour Organization (ILO)**, sectors like **manufacturing and services** are experiencing automation of **repetitive tasks**, leading to **potential job displacement**.
- **Skill Mismatch:** There's a growing need for expertise in **AI, cybersecurity, and data science**. However, a significant portion of the workforce lacks these **specialized skills**, leading to a mismatch between job requirements and available talent.
- **Uneven Technology Adoption:** Urban areas are rapidly **adopting new technologies**, while rural regions **lag behind**, leading to disparities in employment opportunities and economic growth.
- **Informal Sector Challenges:** Workers in the informal sector, which constitutes a **significant part of India's economy**, may find it hard to transition to technology-driven jobs due to **lack of access to training and education**.

8th Edition of the National Programme for Organic Production

Why in News?

The 8th edition of the **National Programme for Organic Production (NPOP)** was launched in New Delhi, highlighting India's potential in organic farming. The Union Minister of Commerce & Industry announced that **organic farming exports** could reach Rs 20,000 crore in next three years.

What is the National Programme for Organic Production?

- **About:** The NPOP, launched in 2001 implemented by **Agricultural and Processed Food Products Export Development Authority (APEDA)** under the **Ministry of Commerce & Industries**, focuses on **accreditation**, **organic production standards**, and **promoting organic farming**.
 - It enhances India's global competitiveness in organic farming. NPOP standards for production and accreditation are recognized by the **European Commission** and **Switzerland**, allowing Indian organic products to be accepted internationally.
- **Key Highlights of the 8th Edition NPOP:** The event highlighted new initiatives and **technological advancements** aimed at boosting organic farming, streamlining operations, and strengthening India's position in the global organic market.
 - **Recognition for Organic Grower Groups:** Simplified certification requirements, **granting legal status to grower groups**, replacing the previous **Internal Control System (ICS)**, which was a quality assurance system used for group certification.
 - **Technological Advancements:**
 - **NPOP Portal:** Provides visibility and ease of operations for organic stakeholders.
 - **Organic Promotion Portal:** Connects farmers, **Farmer Producer Organisations (FPOs)**, and exporters with global buyers, offering trade leads, training, and events.

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Note:

- **TraceNet 2.0:** An upgraded system for transparency, traceability, and compliance, ensuring farm-to-market compliance and streamlining operations to meet global standards.
- **AgriXchange Portal:** Facilitates data analysis and connects international buyers and sellers.

What is Organic Farming?

- **About:** Organic farming is an agricultural system that emphasizes the **health of soils, ecosystems, and people by avoiding synthetic chemicals** and focusing on natural processes.
 - It relies on **ecological cycles, biodiversity, and combines tradition, innovation, and science** to promote environmental benefits and fair relationships.
 - While generally Organic farming avoids external inputs, certification systems allow the use of **organic, biological, and mineral supplements** when needed.
- **Status of Organic Farming:** India's rank 2nd in terms of World's Organic Agricultural land.
 - Sikkim became the **world's first fully organic state**, and North East India has traditionally practiced organic farming with lower chemical use.
 - India has the **largest number of organic producers** in the world, with 2.3 million farmers.
 - As of 2023-24, around **4.5 million hectares** (2.5% of total agricultural land) are under organic certification.
 - The top four states Madhya Pradesh (26%), Maharashtra (22%), Gujarat (15%), and Rajasthan (13%) account for nearly 76% of India's total organically cultivated area.
- **Key Organic Products in India:** Major organic exports from India include flax seeds, sesame, soybeans, tea, medicinal plants, rice, and pulses. **India is a global leader in organic cotton production.**
- **Types of Organic Farmers in India:**
 - **Traditional Organic Farmers:** Located in **low-input zones** like **North-Eastern Region farmers**, these farmers have practiced organic farming as a tradition, **typically without certification.**
 - **Reactive Organic Farmers:** These farmers have switched to organic practices in response to issues

like **soil degradation, food toxicity**, and rising costs. This group includes both certified and uncertified farmers.

- **Commercial Organic Farmers:** These farmers and enterprises adopt organic farming for market opportunities and **premium prices**. Most are certified and focus on both domestic and global markets.
- **Progress of Organic Farming in India:**
 - **National Project on Organic Farming (NPOF):** Introduced in **2004** to promote organic farming through training, capacity building, and development of organic inputs like **bio-fertilizers** and **bio-pesticides**.
 - **Participatory Guarantee System (PGS):** Introduced in **2011** to simplify certification procedures and reduce costs, making certification more accessible to farmers.
 - **Paramparagat Krishi Vikas Yojana (PKVY):** The **PKVY** was launched under the **National Mission of Sustainable Agriculture**, aimed at promoting traditional organic farming practices through **farmer clusters**, financial assistance, training, and certification support.
 - **Mission Organic Value Chain Development for Northeastern Region (MOVCDNER):** The **MOVCDNER** is focused on creating a value chain for organic farming in Northeastern states to enhance market access and income for farmers.
 - **FSSAI Organic Foods Regulation:** In 2024, **Food Safety and Standards Authority of India (FSSAI)** and APEDA launched the **"Unified India Organic"** logo replacing the **India Organic and Jaivik Bharat logos**, to standardize and streamline the implementation of India's organic regulations under the NPOP.

Note: **Natural farming** is a **chemical-free, traditional farming system** that integrates crops, trees, and livestock with biodiversity.

- It focuses on **on-farm biomass recycling**, cow dung-urine formulations, and soil aeration while excluding synthetic chemicals.
- Natural farming aims to reduce reliance on **purchased inputs (organic or chemicals)**, making it cost-effective and promoting rural development and employment.

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Note:

Organic Vs Natural Farming

Organic and natural Farming

- Both are non-chemical systems of farming
- Based on diversity, on-farm biomass management and biological nutrient recycling
- Diversity, rotation multiple cropping and resource recycling is key

Organic farming

- Open for use of off-farm organic and biological inputs
- Does not allow Genetically modified seeds or products
- Also open for micronutrient correction through use of minerals
- Widely popular, Global market at 132 billion US\$

Natural farming

- No external inputs
- On-farm inputs based on Desi Cow (Jeevamrit, Beejamrit, Ghanajeevamrit)
- Biomass recycling through mulching
- Use of compost/ vermicompost and minerals are not allowed
- Evolving, markets are yet to be developed

What are the Challenges in Organic Farming in India?

- **High Certification Costs:** Obtaining organic certification (e.g., NPOP, PGS) is expensive, deterring small and marginal farmers.
 - Additionally, the **EU's non-recognition of the PGS** limits market access for Indian producers compared to those with NPOP certification.
- **Lack of Infrastructure:** Inadequate cold storage, processing facilities, and supply chain infrastructure lead to **post-harvest losses**.
- **Limited Awareness:** Lack of knowledge about organic certifications and misleading labels like “**natural**” and “**chemical-free**” erode consumer trust and unfairly compete with genuine organic products.
 - Organic products are seen as expensive, limiting appeal to lower-income groups, while lack of consumer education hampers demand growth.
- **Low Productivity:** Organic farming **often yields lower during the transition phase**, with limited availability of **bio-inputs like fertilizers and pest control agents**.

- **Market Access and Premium Pricing:** Organic products face **competition from cheaper conventional goods**, and small-scale farmers struggle to access **organized markets and earn premium prices**.
- **Global Trade Barriers:** Non-tariff barriers, such as differing organic standards and regulations across countries, complicate exports.
 - Withdrawal of trade agreements, like the **US Organic Recognition Agreement in 2021**, hampers growth.
- **Climate and Pest Challenges:** Organic farming is more vulnerable to climate variability and pest infestations due to the limited use of chemical interventions.
- **Lack of R&D and Training:** Insufficient research on organic farming techniques and suitable crop varieties.

Chhattisgarh Links Forest Ecosystem to Green GDP

Why in News?

Chhattisgarh has become the **first state in India to link its forest ecosystem to the Green Gross Domestic Product (Green GDP)**.

- This approach highlights the **economic and environmental value of forests**, focusing biodiversity conservation and climate change mitigation.
- The initiative aligns with the broader goal of achieving **sustainable development** while fostering economic growth.

What is Green Gross Domestic Product (Green GDP)?

- **Traditional GDP:** A measure of the **annual value of goods and services** produced within a country, **GDP** has been the global standard since 1944.
 - **Simon Kuznets**, the economist who created GDP, stated that **GDP doesn't reflect a nation's true welfare**, as it ignores factors like environmental health and social well-being.
- **Green GDP:** It is a **modified version of traditional GDP** that accounts for the **environmental costs of economic activities**.

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Note:

- It incorporates factors such as **natural resource depletion, environmental degradation, and pollution into the economic output**, offering a more comprehensive picture of a nation's true wealth.
- **Need for Green GDP:** Traditional GDP overlooks **sustainability, environmental degradation, and social welfare**. It focuses solely on **economic output** without considering the long-term consequences on the environment.
- Green GDP, on the other hand, ensures that **economic growth aligns with sustainable practices**, reflecting the true cost of environmental damage and the depletion of natural resources.

➤ **Formula:**

- According to the **World Bank**, **Green GDP = NDP (Net Domestic Product) – (Cost of Natural Resource Depletion + Cost of Ecosystem Degradation)**.
- Where $NDP = GDP - \text{Depreciation of Produced Assets}$.
- **Cost of Natural Resource Depletion** refers to the value lost due to overuse of natural resources.
- **Cost of Ecosystem Degradation** refers to the value lost from environmental damage such as pollution and deforestation.

GDP AND RELATED TERMS

GROSS DOMESTIC PRODUCT (GDP):

- Total monetary value of all finished goods/services produced within a country in one year
- 3 methods to calculate GDP - expenditures, production, income Method
- Provides an economic snapshot to estimate a country's economy/growth rate
- GDP is not an accurate measure of the overall living standard/well-being of a country
- $GDP = \text{Goods and services consumed (C)} + \text{Investments (I)} + \text{Govt expenditures (G)} + (\text{Exports (X)} - \text{Imports (M)})$

Term	Description
GDP	Measures economic activity within the physical borders of a country Producers can be native or foreign-owned entities
GNP	Measures overall production of people/corporations native to a country Includes those based abroad (by natives) but not foreign-owned domestic production
GNI	Sum of all income earned by citizens/nationals of a country (domestic + abroad) $GNI = \text{domestic income} + \text{indirect business taxes} + \text{depreciation} + \text{net foreign factor income}$

Nominal GDP (NGDP)

- GDP at current prices
- Includes inflation/pace of rising prices
- Used to compare different quarters of output (in same year)

Real GDP (RGDP)

- Inflation-adjusted GDP
- More accurate reflection of the output of an economy than NGDP
- Used to compare GDP of 2 or more years
- Calculated using a GDP Price Deflator
 $RGDP = NGDP \div \text{GDP Deflator}$

$$\text{GDP Price Deflator} = (NGDP \div RGDP) \times 100$$

Example: Assume a country that only produces bread

Year 2021: It produced 100 units of bread @ price Rs 10 (each)
Then, GDP @ current price - Rs 1000

Year 2022: It produced 110 units of bread @ price Rs 15 (each)
Then, GDP @ current price - Rs 1650

RGDP for year 2022 (base year - 2021) = $110 \times \text{Rs } 10 = \text{Rs } 1,100$
Here, **GDP Deflator** would be - $1,650 \div 1,100 = 1.50$ (or 150%)

Relationships:

$GDP \xrightarrow{+d} NDP$ (where $d = \text{depreciation}$)
 $NDP \xrightarrow{-d} GDP$

$GNP \xrightarrow{+(NFIA)} NDP$ (where $NFIA = \text{Net Factor Income from Abroad}$)
 $NDP \xrightarrow{-(NFIA)} GNP$

$GNP \xrightarrow{+d} NNP$
 $NNP \xrightarrow{-d} GNP$

Legend: $d = \text{depreciation}$, $NFIA = \text{Net Factor Income from Abroad}$, $NNP = \text{Net National Product}$, $NDP = \text{Net Domestic Product}$

● **Factor Cost (FC) = Total value of the inputs that go into manufacturing a good**

● **Market Price (MP) = Factor Cost + Indirect Taxes - Subsidies**

● **GDP at FC = GDP at MP + Subsidies - Indirect Taxes**

● **GDP at MP = $GVA \times MP$**

● **GDP at MP is the measure of GDP in India**

● **Gross Value Added (GVA) = GDP + subsidies on products - taxes on products**

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Note:

Note: In 2024, Uttarakhand became the first state globally to launch the **Gross Environment Product (GEP) Index**. This index goes beyond traditional ecosystem services to also measure contributions made to the environment.

- The GEP Index incorporates factors such as **tree species value, survival rates, and conservation efforts**, offering a comprehensive approach to assessing ecosystem growth.

What does the Green GDP Link with Forests Mean for Chhattisgarh?

- **Role of Forests in Chhattisgarh:** Chhattisgarh recorded the highest increase in forest cover in **India State of Forest Report 2023**, growing by 683.62 sq km.
 - The state's total forest cover now spans **44.2% of its geographical area**, playing a key role in absorbing **carbon dioxide**, contributing significantly to climate change mitigation.
 - Chhattisgarh's natural resources support the **livelihoods of millions**, with forest products like **tendu leaves, lac, honey, and medicinal plants** being vital to the **rural economy**.
 - Chhattisgarh's forests are vital to local tribal traditions, and preserving cultural heritage, with **sacred groves like Sarna and Mandar** revered as divine abodes.
- **Implications of linking Forests with Green GDP:** This approach highlights the **economic and ecological value of forests**, fostering a balance between development and sustainability.
 - By prioritizing the preservation of natural resources, the **state aims to ensure the long-term health** of its environment for future generations.

How does Green GDP Promote Sustainable Development?

- **Sustainable Resource Use:** By accounting for environmental damage, Green GDP promotes **SDG 12 (Responsible Consumption and Production)** by encouraging more sustainable production and consumption patterns.

- Green GDP shifts the focus from **merely maximizing economic output** to preserving the **natural capital that supports long-term prosperity**.
- **Climate Change Mitigation:** Green GDP supports the reduction of **reliance on fossil fuels** and adoption of **renewable energy**, contributing to the fight against climate change aligning with **SDG 13 (Climate Action)**.
- **Biodiversity Conservation:** Green GDP promotes environmental preservation, safeguarding ecosystems and species, aligning with **SDG 15 (Life on Land)** and **SDG 14 (Life Below Water)**.
 - It enables policymakers to create regulations that balance economic growth with ecological sustainability.
- **Incentivizes Green Investments:** Green GDP promotes investment in **sustainable technologies and practices**, fostering **green jobs and industries**.
 - It supports **SDG 8 (Decent Work and Economic Growth)** by driving inclusive, sustainable economic growth that prioritizes environmental health.

Global Practices of Green GDP

- **United Nations:** The **System of Environmental-Economic Accounting (SEEA)**, developed by the **United Nations**, integrates **economic and environmental data** to offer a comprehensive view of the interrelationships between the **economy and the environment**, focusing on environmental assets and their benefits to humanity.
- **European Union:** The **EU's Beyond GDP initiative** integrates **sustainability metrics** into economic assessments, focusing on the long-term health of the planet.
- **World Bank:** **Wealth Accounting and the Valuation of Ecosystem Services (WAVES)** is a **World Bank-led partnership** promoting sustainable development by integrating **natural resource accounting** into development planning.
- **Bhutan:** **Bhutan's Gross National Happiness (GNH)** framework places ecological sustainability at the core of its development policies.
- **Other Countries:** **China, Norway, and the US** have experimented with incorporating environmental costs into their national accounts.

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Note:

What Challenges does the Green GDP Framework Face?

- **Forest Cover Definition:** The term “forest” under the [India State of Forest Report \(ISFR\)](#) includes plantations like **oil palm and rubber**, which can be environmentally **damaging** and may not provide the same ecological benefits as natural forests.
 - **Example:** Activities like **palm oil and rubber plantations** often replace **natural forests**, leading to **biodiversity loss**, **soil erosion**, and environmental disruptions.
 - Treating plantations as forests in Green GDP calculations **can create a misleading picture of a state's ecological health**, compromising the framework's reliability.
- **Political Agendas:** States with low ecological forest value **may manipulate data to secure grants** if **forest cover becomes a funding criterion**, by prioritizing plantations over natural forests and which can cause ecological harm.
- **Local Body Integration:** Incorporating local bodies, such as **Panchayats**, in the Green GDP framework is challenging due to the **lack of awareness and literacy among leaders at the grassroots level**.
- **Lack of Clarity on Benefits:** The financial benefits of Green GDP accounting lack clarity on how they will reach local communities, such as **tribes and forest dwellers**, who have traditionally **preserved forests for generations**.
- **Methodological Differences:** There is **no single, universally accepted method for calculating Green GDP**, making it difficult to compare across countries.
 - Valuing environmental costs and services is a complex process and can vary depending on local conditions and priorities.

Household Consumption Expenditure Survey 2023-24

Why in News?

The [Ministry of Statistics and Programme Implementation \(MoSPI\)](#) has released the factsheet of

the [Household Consumption Expenditure Survey \(HCES\) 2023-24](#), providing key insights into consumption patterns and economic well-being in India.

Household Consumption Expenditure Survey

- The HCES collects data on household spending patterns to assess living standards, well-being, and consumption behavior.
- HCES has been conducted by the [National Statistical Office \(NSO\)](#) since 1951 as part of the [National Sample Survey \(NSS\)](#) under the **MoSPI**.
- **Significance:** Provides inputs for calculating [Consumer Price Indices \(CPI\)](#) and revising the base year for macroeconomic indicators like [Gross Domestic Product \(GDP\)](#).
 - HCES helps to measure **poverty**, inequality, and social well-being.

What are the Key Findings of the HCES 2023-24?

- **Rising Consumption:** Rural consumption spending increased significantly, with the average **monthly per capita expenditure (MPCE)** rising to **Rs 4,122 (up 9.3% from Rs 3,773 in 2022-23)**.
 - The MPCE of urban areas is **Rs 6,996 (up 8.3% from Rs 6,459 in 2022-23)**.
 - The gap between rural and urban consumption narrowed from **83.9% in 2011-12 to 69.7% in 2023-24**, suggesting that rural consumption is growing faster than urban consumption.
 - Imputed values for **free benefits** (e.g., food grains, school uniforms) under welfare schemes marginally increased MPCE estimates.
 - Rural MPCE **Rs 4,247 (with imputation)** and Urban **Rs 7,078 (with imputation)**.
- **Regional Disparities:** **Sikkim** had the highest MPCE (**rural Rs 9,377 and urban Rs 13,927**), while **Chhattisgarh** (**rural Rs 2,739 and urban Rs 4,927**) recorded the lowest.
 - **Maharashtra, Punjab, Tamil Nadu, Telangana, and Kerala**, showed higher-than-average per capita consumption spending.
 - **West Bengal, Bihar, Uttar Pradesh, and Madhya Pradesh**, had lower spending than the national average.

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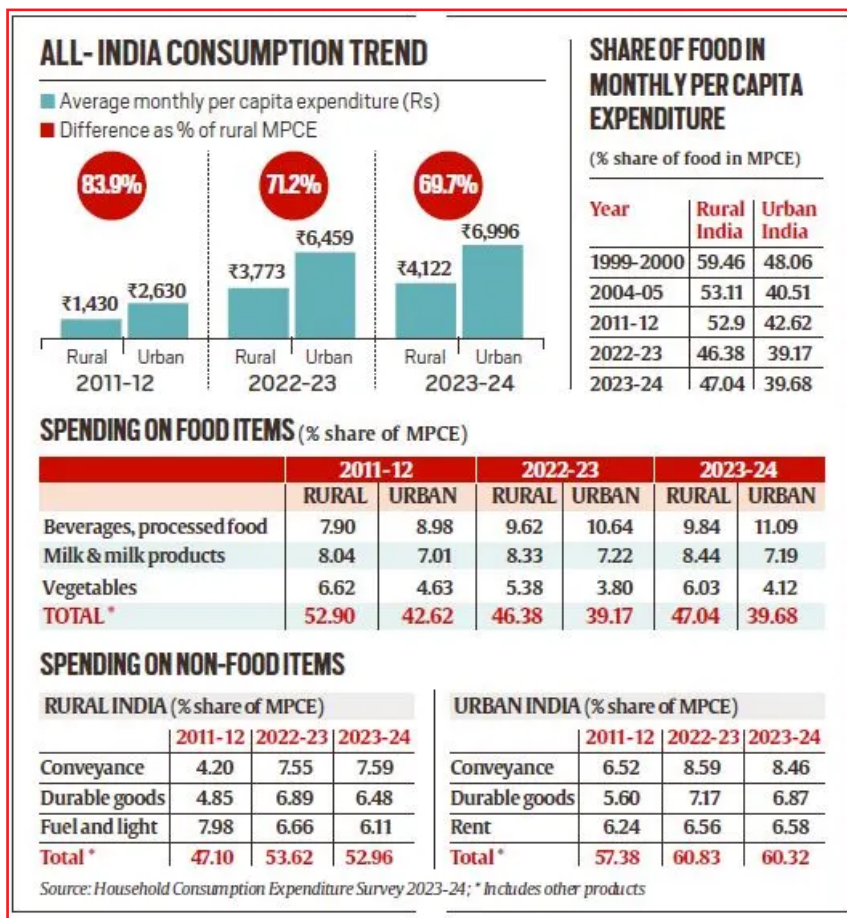


Note:

- Among the Union Territories (UTs), MPCE is the highest in **Chandigarh** (Rural Rs. 8,857 and Urban Rs. 13,425), whereas it is the lowest in Dadra and Nagar Haveli and Daman and Diu (Rs. 4,311) and Jammu and Kashmir (Rs. 6,327) in rural and urban areas, respectively.
- **Consumption Inequality:** The **Consumption Inequality**, as measured by the **Gini coefficient**, has decreased in both rural and urban areas.
 - The **Gini coefficient dropped from 0.266 to 0.237** in rural areas and from 0.314 to 0.284 in urban areas from 2022-23 to 2023-24.
- **Food Expenditure:** In 2023-24, spending on **food increased in both rural (47.04%) and urban (39.68%) areas**, reversing previous declines.
 - The highest food expenditure was on **beverages, refreshments, and processed food**, followed by milk, milk products, and vegetables.
- **Non-Food Expenditure:** The share of non-food expenditure remained high, at **52.96%** in rural areas and **60.32%** in urban areas.
 - Rural households spent more on **conveyance** (7.59%), **medical expenses** (6.83%), and **clothing and bedding** (6.63%), while urban households spent more on **conveyance** (8.46%), **miscellaneous goods** (6.92%), and **rent** (6.58%).
- **Fractile Consumption Patterns:** In 2023-24, consumption spending

decreased for the top 5% of both rural and urban populations, compared to 2022-23.

- In contrast, the bottom 5% saw significant increases, with rural spending rising 22% and urban spending growing 19%.
 - This shows significant growth in consumption for the lower-income groups, indicating economic improvement.



Key Terms

- **Monthly Per Capita Expenditure (MPCE):** The average monthly expenditure per person on essentials like food, healthcare, education, transportation, and other basic needs.
- **Consumption Inequality:** It refers to the unequal distribution of consumption expenditures or goods and services across individuals or households within an economy.
 - The Gini coefficient measures consumption inequality, where **0** represents perfect equality and **100** signifies perfect inequality. It quantifies the disparity in consumption across households or individuals.

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Note:

What are the Implications of HCES Findings on Policy Making?

- **Rural Development:** The narrowing rural-urban gap indicates **rising rural incomes**, likely driven by schemes like **Pradhan Mantri Kisan Samman Nidhi (PM-KISAN)** and **Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)**, warranting further policy support.
 - The relatively **high spending on conveyance in rural areas** indicates the need for improved rural transport infrastructure to reduce costs.
 - Encourage investments in rural **non-food sectors like conveyance and durable goods**.
- **Sectoral Shifts:** The growing expenditure on services (e.g., conveyance, entertainment) points to a shift toward a **service-driven economy**.
 - Policies should focus on **skilling and job creation in these emerging sectors**.
 - With rural consumption rising, policies should aim to **sustain this growth through skill development and rural industrialization**.
- **Urban Planning and Housing:** High urban spending on rent and conveyance highlights the need for **affordable housing policies and improved public transport infrastructure**.
 - Urban policies **must address stagnation in income growth**, particularly for the middle class, to ensure equitable growth.
- **Regional Disparities:** States with **lower-than-average consumption**, such as Bihar, require focused interventions in education, healthcare, and employment to boost economic activity.
- **Consumer Protection:** Policymakers should **regulate processed food industries** to ensure quality standards and consumer safety.

Read more: [SBI Reports Decline in Poverty in India](#)

SBI Reports Decline in Poverty in India

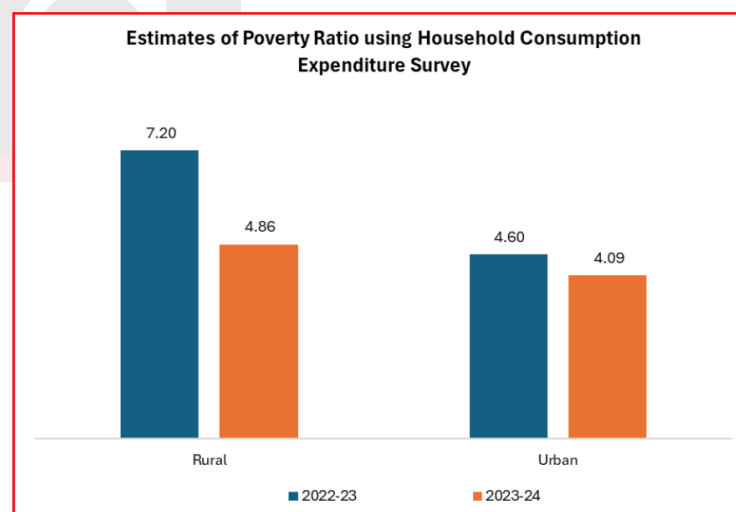
Why in News?

A recent research report by the **State Bank of India (SBI)** highlights a remarkable **decline in poverty rates across rural and urban India**.

- The report attributes this decline to targeted government interventions, enhanced rural infrastructure, and improved consumption patterns among lower-income groups.

What are the Key Findings of the SBI Report?

- **Decline in Poverty Rates:**
 - **Rural Poverty:** Reduced to **4.86%** in FY24 from 25.7% in 2011-12.
 - **Urban Poverty:** Estimated at **4.09%** in FY24, down from 13.7% in 2011-12.



- **Impact of Government Interventions:** **Direct Benefit Transfers (DBT)**, infrastructure development, and farmer-centric initiatives have improved rural livelihoods and reduced consumption inequality.
 - **Targeted programs** addressing income support and social security have significantly **benefited lower deciles of income groups**.
- **Improved Consumption in Rural Areas:** Rural consumption is **growing rapidly** and catching up with urban consumption. The

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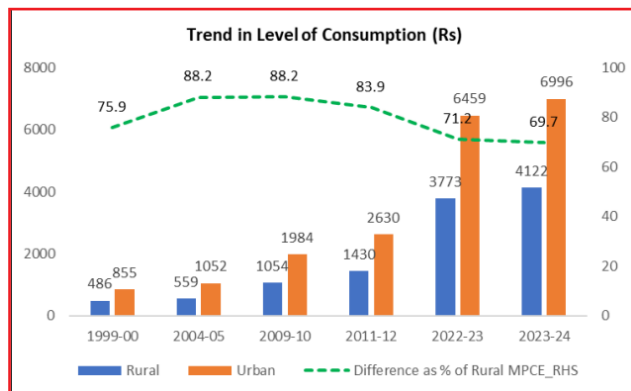
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Note:

rural **Monthly Per Capita Consumption Expenditure (MPCE)** i.e. difference between urban and rural consumption, measured as a percentage of rural consumption, **has been declining**.

- It reduced to **69.7% in 2023-24** from **88.2% in 2004-05**, showing a narrowing gap between rural and urban spending.



- This has also been supported by data from the latest **Household Consumption Expenditure Survey (August 2023–July 2024)** which indicated a decreasing gap in MPCE between urban and rural areas from 84% in 2011-12 to 71% in 2022-23, and further to 70% in 2023-24.

- **Poverty Line Definition:** The estimated **poverty line** in FY24 is Rs 1,632 for rural areas and Rs 1,944 for urban areas after adjusting for inflation and imputation factors.

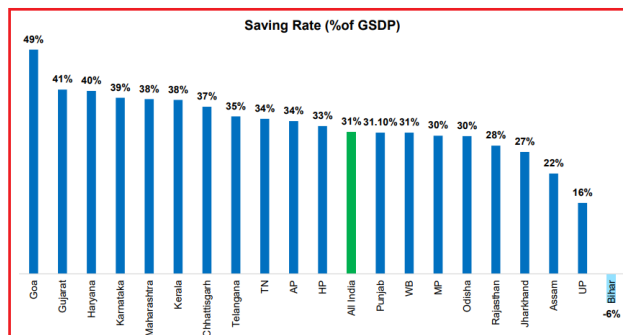
- Earlier, in 2011-12, the **Tendulkar Committee** had determined the poverty threshold to be Rs 816 for rural regions and Rs 1,000 for urban regions.

- **State-wise Savings:** The state-wise savings rate was estimated using MPCE and **Per Capita Income**, factoring in the rural and urban population distribution.

- States with **higher incomes** report savings rates **above the national average of 31%**, indicating **stronger financial stability**.
- **Low-income states** like **Uttar Pradesh** and **Bihar** show **low savings rates** which is likely due to **high outward migration**, which affects **income retention** and **consumption patterns**.

- Bihar is the **only state** showing a **negative saving rate at -6%**

- There's a **significant disparity** between the **highest (Goa: 49%)** and **lowest (Bihar: -6%)** saving rates.



➤ Impact of Inflation:

- **Elasticity of Consumption Demand:**

- **Consumption demand is elastic ($|e| > 1$)**, meaning that **changes in food prices significantly impact overall spending** including food expenditures.
- Rising food prices lead to a **decrease in MPCE**, with the **negative elasticity in both low- and high-income states** indicating that **higher food inflation reduces consumption**, in line with the **law of demand**.
 - Rural areas in low-income states are more severely affected by rising food prices, reflecting greater vulnerability.
- In contrast, **lower food inflation boosts MPCE in middle-income states**, where **positive elasticity** indicates that **reduced food inflation enhances consumption and sustains demand**.
 - Urban segments of middle-income states show significant increases in MPCE with falling food inflation.

- **Regional Disparities:**

- The **impact of the rural-urban gap is small in low-income states** but **more noticeable in high-income states**.
 - This indicates that **rural people in low-income states are more cautious** about taking risks than those in high-income states.

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Note:

Government Initiatives to Alleviate Poverty

- [Prime Minister Street Vendor's AtmaNirbhar Nidhi – PM SVanidhi](#)
- [Pradhan Mantri Shram Yogi Maan-Dhan \(PM-SYM\)](#)
- [National Nutrition Mission \(NNM\)](#)
- [Pradhan Mantri Garib Kalyan Yojana \(PMGKY\)](#)
- [Pradhan Mantri Suraksha Bima Yojana](#)

LEADS 2024 Report

Why in News?

Recently, the **Ministry of Commerce & Industry** released the 6th [Logistics Ease Across Different States \(LEADS\)](#) 2024 report.

- **GatiShakti Vishwavidyalaya (GSV)** launched a course on **PM GatiShakti Concept for Efficient Infrastructure Planning and National Development**.
- **Ranking of States and UTs in 2024:**

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

Key Recommendations:

- The logistics sector needs to adopt the **LEAD framework** to transform the logistics sector.
 - LEAD framework includes **Longevity, Efficiency and Effectiveness, Accessibility and Accountability, and Digitization of processes**.
- Promotion of **green logistics** and sustainable transport initiatives.
- Encouraging **public-private partnerships (PPPs)** to enhance multi-modal logistics hubs.
- Develop **regional and city-level logistics plans** as well for last-mile connectivity.

What are the Key Highlights of the LEADS 2024 Report?

- **About:** It is an annual assessment released by the **Ministry of Commerce and Industry** to promote **inter-state competitiveness** and help policymakers improve logistics performance.
 - LEADS was conceived on the lines of the [Logistics Performance Index \(LPI\)](#) of [World Bank](#) in 2018.
- **Objective:** It aims to evaluate logistics performance across **States and Union Territories (UTs)** to identify **reforms, attract investments**, and improve **logistics efficiency**.
- **Evaluation:** The report assesses logistics performance based on **four key pillars**:
 - Logistics Infrastructure
 - Logistics Services
 - Operating and Regulatory Environment
 - **Sustainable Logistics** (introduced in 2024).

India's Logistics Sector

- **Contribution:** It contributes **13-14% to India's GDP** and provides livelihood to over **22 million people**; projected to add **1 crore jobs by 2027**.
 - In **FY22**, India's logistics market stood at **USD 435 billion** and is projected to expand to **USD 591 billion by FY27**.

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Note:

- **Logistics Costs:** Presently, India's logistics cost is **13-14% of GDP** which is extremely high.
 - The **National Logistics Policy (NLP) 2022** aims to reduce India's logistics costs to align with global benchmarks of **8-9% of GDP**.
- **Global Position:** India ranked **38th among 139 countries** in the World Bank's **Logistics Performance Index Report 2023**.
 - The LPI is an **interactive tool** developed by the **World Bank** that helps countries **identify challenges and opportunities** in trade logistics and **improve their performance**.

Farmer's Demand for Legalizing MSP

Why in News?

The **Supreme Court (SC) of India** recently criticized the Central Government for failing to engage with protesting farmers and address their grievances.

- The court urged the Centre to consider the demands of farmers while responding to a fresh plea seeking a **legal guarantee for Minimum Support Price (MSP)**.
- This development follows the prolonged protests by farmer groups at the **Punjab-Haryana border**.

What is the Petition for MSP Guarantee?

- **Petition:** It seeks a legal guarantee for MSP on crops, based on promises made during the **2021 farmers' protests** after the **repeal of the farm laws**.
 - The petition demands that the **MSP must be enshrined as a legal right to ensure stable incomes** for agricultural producers.
- **SC's Response:** The SC while not issuing a direct order, the **Court suggested using the High-Powered Committee** to resolve the issue and asked the Centre to respond immediately.
 - The SC's involvement adds legal weight to the ongoing protests, suggesting the need for a more systematic and legal solution.

Why are Farmers Protesting in India?

- **Reasons For Farmers Protests:** The protests stem from long-standing grievances dating back to **India's 1991 economic liberalisation**, which prioritised industrialisation over agriculture.
 - This has led to increasing distress in rural areas, where farmers struggle with low crop returns and rising input costs.
 - Though the **government sets MSP for many crops, implementation is limited**, with procurement mostly for rice and wheat.
 - Farmers, especially in **non-major cropping areas**, often sell produce below production costs.
 - The **World Trade Organisation (WTO)** agreements, which are often seen as **promoting free trade**, limit India's ability to **impose trade restrictions or provide subsidies to farmers**.
 - This, according to the protesters, hinders India's ability to control procurement policies and subsidies for farmers.
- **Key Demands of Farmers:** The primary demand is for a law that guarantees MSP for all crops.
 - This is based on the **Swaminathan Commission Report**, which recommends a 50% profit margin over the cost of production, using the '**C2+ 50%**' formula.
 - The **comprehensive cost (C2)** includes all **paid-out expenses**, the imputed value of unpaid family labor, rentals, and interest foregone on owned land and fixed capital.
 - While **MSPs are currently fixed at 50% above A2+FL**, which includes paid-out expenses and unpaid family labor.
 - **Other Key Demands: Full debt waiver for farmers and labourers.** Compensation and pensions for farmers, particularly for those affected by protests or agricultural distress.
 - Better working conditions and wages for agricultural labour.
 - Protection of **indigenous peoples' rights** over land and water.

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Note:

- **Government's Position:** The central government has repeatedly stated that a legal **guarantee for MSP would be unfeasible**, citing logistical challenges and the high cost of procurement.
 - The government is also concerned about the **economic implications of such a policy**, including **food inflation** and **budgetary constraints**.

What are the Arguments For and Against the Legalization of MSP?

- **Arguments for the Legalization of MSP:**
 - **Addressing Farmer Distress:** Legalizing MSP ensures farmers **receive fair prices for their crops**, addressing low returns from market fluctuations and providing **financial security** by covering production costs and guaranteeing fair returns for farmers.
 - **Agriculture's share in India's economy has dropped to below 15%**, with **minimal income growth for farmers** despite industrial and services sector growth.
 - Legalizing MSP can bridge this gap by ensuring fair prices and supporting agricultural development.
 - **Promoting Formal Markets:** Legalizing MSP could promote **formal market transactions**, reduce reliance on **informal markets**, and align with the government's goal of enhancing **transparency through digital agriculture**.
 - **Stable Market Prices:** Legalizing MSP can reduce **price volatility** in the agricultural market, stabilizing both farm incomes and consumer prices.
 - **Cost Calculation Methods:** The **current methods of cost calculation often fail to reflect the true cost of cultivation**, leading to prices below farmers' expenses.
 - A more accurate pricing model, such as the C2+50% method, could better align agricultural prices with other sectors.
- **Agricultural Investment:** Legalizing MSP would **provide farmers with a predictable income**, encouraging investment in agriculture and improving productivity through **sustainable practices and green technologies**.
- **Arguments Against the Legalization of MSP:**
 - **Logistical Challenges:** Implementing MSP across all crops nationwide is **difficult due to inadequate infrastructure**, such as the **mandi system**, which is not functional in many states.
 - **High Costs for Government:** Procuring all crops at **MSP would require massive financial resources**, leading to budgetary constraints and potential economic strain.
 - **Food Inflation:** MSP could lead to **higher food prices**, affecting consumers, especially if the government is forced to buy all crops at MSP.
 - **Market Distortion:** A legal MSP could **disrupt the natural dynamics of supply and demand** in agricultural markets, leading to inefficiencies.
 - **WTO Constraints:** International trade agreements like the **WTO limit the ability of the government** to provide subsidies or impose restrictions on agricultural trade, which could undermine the effectiveness of MSP legalization.

What Can be Alternatives to Legalizing MSP Nationwide?

- **Targeted Approach:** Legalizing MSP for a smaller percentage of crops could stabilize prices without straining the procurement system.
 - This can be supported by **Pradhan Mantri Annadata Aay Sanraksan Abhiyan (PM-AASHA)**, which ensures fair prices for farmers through MSP and price deficiency payments.
 - Some states, such as **Madhya Pradesh, Chhattisgarh, and Odisha**, have **successfully expanded procurement systems**.

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Note:

- Instead of a nationwide rollout, state-specific legislation for legalizing MSP, tailored to local conditions, could be considered to address regional agricultural challenges effectively.
- **Cooperatives' Role:** One alternative being considered is the **promotion of cooperatives and FPOs**, which have been successful in some sectors like **milk production**.
- **Supportive Infrastructure:** A robust legal framework, modern storage facilities, and improved infrastructure are essential for cooperatives and FPOs.
- The **Pradhan Mantri Kisan Sampada Yojana (PMKSY)** can complement this by enhancing infrastructure and reducing **post-harvest losses**.
- **Contract Farming:** Encouraging **contracts between farmers and corporations** or cooperatives, where farmers can secure a guaranteed price for their produce.
- **Crop Insurance Schemes:** Expanding and improving crop insurance to protect farmers against losses due to natural disasters or market fluctuations through initiatives like the **Pradhan Mantri Fasal Bima Yojana (PMFBY)**.
- **Diversification:** Encouraging farmers to diversify their crops and income sources, reducing their dependence on a few crops that may be subject to market volatility.

MINIMUM SUPPORT PRICE (MSP)

The rate at which the govt. purchases crops from farmers; based on a calculation of at least 1.5x the cost of production incurred by the farmers

RECOMMENDED BY

Commission for Agricultural Costs & Prices (CACP) (recommends MSPs for 22 mandated crops and Fair and Remunerative Price for Sugarcane)

22 MANDATED CROPS

(14 Kharif, 6 Rabi and 2 Other Commercial crops)

CEREALS	Paddy, Wheat, Barley, Jowar, Bajra, Maize And Ragi
PULSES	Gram, Arhar/tur, Moong, Urad And Lentil
OILSEEDS	Groundnut, Rapeseed/mustard, Soyabean, Sunflower, Sesamum, Safflower And Niger Seed
RAW COTTON	
RAW JUTE	
COPRA	

MSP is the price at which the govt. is supposed to procure the mandated crops from farmers if the market price falls below it

FACTORS FOR RECOMMENDING MSP

- Cost of cultivation
- Demand-Supply situation for the crop
- Market price trends
- Inter-crop price parity
- Implications for consumers (inflation)
- Environment (soil and water use)
- Terms of trade b/w agri and non-agri sectors (ratio of farm inputs and outputs)

Considers both A2+FL and C2 costs

MSP has no statutory backing — a farmer cannot demand MSP as a matter of right

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Note:

Extension of Crop Insurance Schemes

Why in News?

The **Union Cabinet** has approved critical measures to support **Indian farmers**, including the extension of a special subsidy for **Diammonium Phosphate (DAP)** fertilizers and the continuation of crop insurance schemes until 2025-26.

What are Recent Key Measures to Support Indian Farmers?

- **Crop Insurance Scheme:** The Union Cabinet approved the continuation of the **Pradhan Mantri Fasal Bima Yojana** and **Restructured Weather Based Crop Insurance Scheme (RWBCIS)** till 2025-26.
- **Di-Ammonium Phosphate (DAP):** It approved extending the one-time special package on DAP beyond the **Nutrient Based Subsidy** from **1st January, 2025** till further orders.
 - It ensures **affordable DAP fertilizers** for farmers in **Kharif and Rabi 2024-25** despite global market volatility.
- **Fund for Innovation and Technology (FIAT):** It approved the creation of FIAT with a corpus of **Rs 824.77 crore** for funding technological initiatives under the scheme namely, **YES-TECH** and **WINDS** for increasing transparency and claim calculation and settlement.
 - **Yield Estimation System using Technology (YES-TECH):** YES-TECH uses **remote sensing technology** for yield estimation with **minimum 30% weightage to technology** based yield estimates.
 - **Weather Information and Network Data Systems (WINDS):** **WINDS** aims to install **automatic weather stations** at the **block level** and **rain gauges** at the **panchayat level**, increasing network density fivefold for **hyper-local weather data**.

Pradhan Mantri Fasal Bima Yojana (PMFBY)

- **About:** It is a **crop insurance scheme** to protect farmers from financial losses due to unforeseen crop failures like **rainfall, temperature, frost, humidity** etc.
- **Aim:** It is a **central sector scheme** and provides comprehensive crop insurance from **pre-sowing to post-harvest period**.
- **Coverage:** It covers **food crops** (cereals, millets and pulses), **oilseeds** and annual **commercial/annual horticultural crops**.
 - All **farmers** including **sharecroppers** and **tenant farmers** growing notified crops in the notified areas are **eligible for coverage**.
- **Premium:** Farmers pay a premium of **2% for Kharif crops**, **1.5% for Rabi crops**, and **5% for commercial horticulture crops** under the scheme.

Note: PMFBY relies on **actual crop loss assessment** to provide compensation to farmers for losses due to natural calamities, pests, or diseases. **In contrast**, **RWBCIS** compensates farmers based on deviations from predefined weather parameters such as **rainfall, temperature, humidity, and wind speed**.

- RWBCIS uses these weather parameters as a proxy for crop yields to estimate and compensate for deemed crop losses, without requiring direct field-level assessment.

India-Latin

America Trade Relations

Why in News?

The **Latin America and Caribbean (LAC)** region has become a key focus of India's foreign policy, with sustained growth and diversified ties **across all 33 nations**. Despite progress, India still lags behind China, which has a far stronger presence in the region.

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Note:



How is India's Relation with Latin America?

➤ Historical Background:

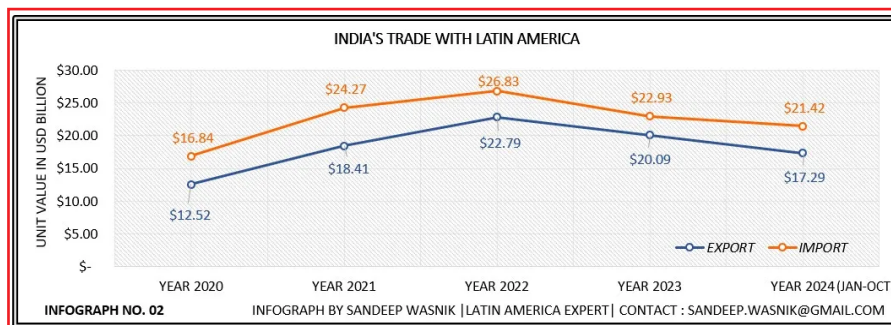
- **Rich Ties:** India-Latin America relations have a rich history, marked by significant contributions from figures like **Pandurang Khankhoje** (an agricultural scientist who played a key role in the advancement of agricultural practices in Mexico) and **M.N. Roy** (a political activist, founded both the Indian and Mexican Communist parties).
- India and Latin America shared a vibrant exchange of literary ideas through poet-diplomats and authors like Octavio Paz, **Rabindranath Tagore**, and Victoria Ocampo, shaping mutual perceptions.
- India's poet-diplomat **Abhay K**, has authored **books of poetry** on the Latin American region,

such as **The Alphabets of Latin America** and **The Prophecy of Brasilia**.

- **Early Engagements:** High-level engagement began with **Prime Minister Nehru's** visit to Mexico in 1961, followed by **Indira Gandhi's** tour of eight Latin American and Caribbean (LAC) nations in 1968.
- **Recent Developments:** The relationship gained momentum with **PM Modi's** participation in the **BRICS Summit** in Brazil in 2014.
- **Economic Liberalization:** Post-1990s **economic liberalization** led to strengthened **trade, investments, and renewable energy cooperation**.
 - India signed trade agreements with seven LAC nations and launched the **FOCUS LAC Program** in 1997 to enhance exports and economic collaboration.

➤ Current Trade Landscape:

- **Trade Figures:** India's total trade with the Latin American and Caribbean region, comprising 43 countries, stood at **USD 35.73 billion** with exports worth **USD 14.50 billion** and imports worth **USD 21.23 billion** during 2023-24.
- **Key Trade Partners:** Brazil, Mexico, and Colombia are India's primary trade partners in the region.
- **Import Composition:** Major imports include **petroleum oils**, gold (including gold plated with platinum), and **soybean oil**.
- **Export Composition:** Key exports consist of **petroleum oils** (excluding crude), **motor cars**, and other **motor vehicles** designed for transportation.
- **Economic Positioning:** Latin America is considered to be in the **"goldilocks zone"** for India—offering a balance between highly regulated markets like the **US and Europe** and less competitive markets in Africa.



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Note:

➤ Political and Bilateral Cooperation:

- **Foreign Policy Priority:** Historically, Latin America has been a low priority in India's foreign policy due to its limited geopolitical influence. However, recent developments indicate a significant shift in this approach.
 - Notably, **External Affairs Minister S. Jaishankar** undertook a landmark visit to **Guyana, Panama, Colombia, and the Dominican Republic in April 2023**, marking the **first time an Indian foreign minister has visited** these countries.
- **Enhanced Engagements:** In 2022, **G20 members Argentina, Brazil, and Mexico** were placed under the **purview of India's foreign minister** instead of a junior minister.
- **Brazil's Leadership Role:** Brazil is recognized as having the most political linkages with India due to its active participation in multilateral forums such as **BRICS, IBSA (India, Brazil and South Africa)**, and the **G20**.
- **Preferential Trade Agreements (PTAs):** The signing of PTAs between India and Chile as well as India and Mercosur reflects Latin America's commitment to strengthening economic relations with India.
 - **MERCOSUR**, a **Latin American trading bloc established in 1991**, comprises six members namely, **Brazil, Argentina, Uruguay, and Paraguay, Venezuela, and Bolivia**.
 - Initially aimed at facilitating the **free movement of goods, services, capital, and people**, it became a **customs union in 1995** and is now advancing towards a Common Market.
- **Strategic Autonomy:** Both regions have embraced a form of non-alignment termed 'strategic autonomy' by India and '**Active Non-alignment**' (ANA) by **Latin American countries**, particularly evident in their shared positions regarding global issues like the **war in Ukraine**.

➤ Cultural Ties:

- **Literary Influences:** Tagore's visit to **Argentina in 1924** and his literary contributions have left a lasting impression on Latin American literature through **translations by Mexican philosopher José Vasconcelos**.

- **Gandhi's Legacy:** **Mahatma Gandhi's** teachings on non-violence resonate strongly in Latin America, celebrated by organizations like **Palas Athenas in Brazil**.

➤ Trade Agreements/MoUs with LAC region:

- **India – Chile PTA**
- **India – MERCOSUR PTA**
- **Trade Agreement between India and Argentina**
- **MoU on Economic Cooperation with Ecuador**
- **Trade Agreement between India and Cuba**

What is the Importance of Latin America for India?

- **Economic Opportunities:** Latin America is rich in natural resources, including minerals like copper, lithium, and iron ore, which are vital for India's growing industrial demands.
 - The region's collective **GDP exceeds USD 6 trillion**, providing a substantial market for Indian exports and investments.
- **Energy Security:** With a rising demand for energy, Latin America has emerged as a key supplier of crude oil to India.
 - In recent years, Crude oil imports from Venezuela, Mexico, and Brazil accounted for **30% of India's total import from LAC**.
 - **Strategic Partnerships:** The geopolitical landscape has shifted, prompting India to enhance its engagement with Latin America **to counterbalance China's growing influence** in the region.
- **Cultural and Educational Exchange:** The cultural ties between India and Latin America have been bolstered through educational exchanges and collaborations in sectors like information technology and pharmaceuticals.
 - **Indian IT companies employ over 40,000 local professionals** in the region, contributing to job creation and skill development.
- **Food Security:** Latin America's vast agricultural landscape **offers opportunities for India to secure food supplies, particularly in pulses and oilseeds**, which are essential for food security.

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Note:

What are the Sectors in which India is Cooperating with Latin American Nations?

- **Pharmaceuticals and Healthcare:** India is recognized globally for its pharmaceutical industry, providing high-quality medicines at affordable prices.
 - The top five destinations for these exports are the USA, Belgium, South Africa, the UK, and **Brazil**.
- **Energy Cooperation:** India is exploring and **extracting lithium deposits in Bolivia**. In 2023, **India's Altmin Private Limited** signed a **strategic partnership agreement** with Bolivia's state-owned lithium company.
 - **Bolivia** also joined the **International Solar Alliance**.
- **Agriculture and Food Security:** The LA region has vast agricultural resources that helps India in addressing its food security concerns.
 - **Collaborations in food processing and agricultural research** are being explored to enhance productivity and sustainability in both regions.
- **Infrastructure Development:** Collaboration in developing modern infrastructure across LA nations, including railways, highways, and energy pathways.
 - India values its development partnership with Bolivia under South-South Cooperation and has extended a **USD 100 million Line of Credit** to support development projects in sectors of Bolivia's choice.

MAJOR TRADE AGREEMENTS OF INDIA

Free Trade Agreement (FTA) With Neighbouring Countries

- ↳ India-Sri Lanka FTA
- ↳ India-Nepal Treaty of Trade
- ↳ India-Bhutan Agreement on Trade, Commerce, and Transit

A free trade agreement is a comprehensive deal between countries, offering preferential trade terms and tariff concessions, with a negative list excluding specific products and services.

Regional FTA's of India

- ↳ **India ASEAN Trade in Goods Agreement (11):** 10 ASEAN countries + India
- ↳ **South Asia Free Trade Agreement (7):** India, Pakistan, Nepal, Sri Lanka, Bangladesh, Bhutan, and the Maldives
- ↳ **Global System of Trade Preferences** (41 countries + India)

India's CECA's and CEPAs

CECA/CEPA is broader than FTAs, addressing regulatory, trade, and economic aspects comprehensively, with CEPA having the widest scope including services, investment, etc while CECA mainly focuses on tariff and TQR rates negotiation.

- ↳ CEPA with **UAE, South Korea, Japan**
- ↳ CECA with **Singapore, Malaysia**

Others:

- India-Australia Economic Cooperation and Trade Agreement (ECTA)
- India-Thailand Early Harvest Scheme (EHS)
- India-Mauritius Comprehensive Economic Cooperation and Partnership Agreement (CECPA)

An EHS precedes an FTA/CECA/CEPA, where negotiating countries select products for tariff liberalisation, paving way for broader trade agreements and fostering confidence.

Preferential Trade Agreements (PTAs)

Partners in a PTA grant preferential access to specific products by lowering duties on agreed tariff lines, maintaining a positive list of products eligible for reduced or zero tariffs.

- ↳ **Asia Pacific Trade Agreement (APTA):** Bangladesh, China, India, S. Korea, Lao PDR, Sri Lanka, and Mongolia
- ↳ **SAARC Preferential Trading Agreement (SAPTA):** Same as SAFTA
- ↳ **India-MERCOSUR PTA:** Brazil, Argentina, Uruguay, Paraguay and India
- ↳ India's PTA with **Chile, Afghanistan**



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Note:

Types of Trade Agreements

- **Free Trade Agreement (FTA):** An FTA is a **comprehensive agreement between two or more countries** aimed at **reducing trade barriers**, such as tariffs and quotas, on a wide range of goods and services.
 - India has negotiated FTAs with several countries, including **Sri Lanka** and various trading blocs like **ASEAN**.
- **Preferential Trade Agreement (PTA):** A PTA is an agreement where **partner countries** provide **preferential access to certain products** by reducing tariffs on specific items. Some tariffs may even be eliminated entirely.
 - Unlike FTAs, **PTAs are generally less comprehensive** and may only cover a limited number of goods. **Some tariffs may even be reduced to zero** for certain products.
 - India has signed a **PTA with Afghanistan**.
- **Comprehensive Economic Partnership Agreement (CEPA):** A CEPA is more extensive than an FTA, encompassing trade in services, investment, and broader economic cooperation. India has established **CEPAs with South Korea** and Japan.
- **Comprehensive Economic Cooperation Agreement (CECA):** A CECA primarily focuses on trade tariffs and **Tariff Rate Quotas (TRQs)** but is less comprehensive than a CEPA. India has signed a **CECA with Malaysia**.

What are the Challenges in Deepening Engagement with Latin American Nations?

- **Lack of Regional Mechanisms:** India has **yet to develop a framework** to engage Latin America as a region or with sub-groups like **Central American Integration System (SICA)**, **Community of Latin American and Caribbean States (CELAC)**, **Mercosur**, and the **Pacific Alliance**.
 - Regional integration within Latin America remains incomplete, making bilateral ties more feasible in the short term.
- **Limited Trade Agreements:** Existing **Preferential Trade Agreements (PTAs)** with **Mercosur** and **Chile** are narrow in scope **compared to India's FTAs with South Korea, Japan, or ASEAN**.

- Despite growing exports, Latin America faces **economic challenges** such as **inflation**, **political instability**, and **low investment** in infrastructure, impacting trade.
- **China's Dominance:** India faces competition from **China's established trade presence**, strategic investments, and **free trade agreements (FTAs)** with key Latin American countries.
- **Geographical Barriers:** Despite positive developments in trade sectors and cultural ties, **geographical distance** and **language barriers** pose challenges for social interactions, including **high travel costs** and **visa difficulties** for Indians traveling to Latin America.
 - Many Indians still view Latin American countries through outdated **stereotypes**, such as **"banana republics"** characterized by instability and drug trafficking. Conversely, **Latin Americans often see India as merely a land of spiritualism and gurus**.
- **Bilateral Synergies:** The relationship is driven by **bilateral cooperation on issues like climate change, trade, and security**, though strategic sectors such as **defense and space** have seen limited engagement.

What Strategies can India Adopt to Increase its Relations with Latin America?

- **Reactivating "Focus:LAC" Programme:** This trade promotion programme can **strengthen market access**, improve institutional mechanisms, and develop economic infrastructure, creating a **conductive environment for business**.
 - Increase selective trade where India have competitive advantage, like
- **Bilateral Agreements and Investment Promotion:** India must pursue **Free Trade Agreements (FTAs)** and **preferential trade arrangements with Latin American countries**, focusing on sectors like **technology, agriculture, and clean energy**.
 - **Promoting People-to-People (P2P) and Business-to-Business (B2B) Connections** between India and Latin American countries will facilitate cultural exchanges and enhance economic collaboration.
- **Diplomatic Engagement:** Strengthening diplomatic ties through high-level visits, participation in **regional**

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Note:

trade summits, and fostering cultural exchange can pave the way for deeper economic collaboration.

- **Enhanced Export Promotion:** Indian exporters need financial support and targeted efforts to penetrate the **Latin American market**.
 - **Export promotion councils** and **industry associations** can play a pivotal role in this regard.
- **Advocating for Latin American Interests:** India should actively raise its voice for Latin American nations such as **Venezuela, Argentina, and Haiti** in international forums.
 - By doing so, India can strengthen its diplomatic ties and showcase solidarity with these nations, especially in **addressing issues like economic instability and political challenges**.
- **Services Trade Enhancement:** Create a comprehensive database of non-tariff barriers in services sectors across FTA partners.
 - Establish **mutual recognition agreements** for professional qualifications on priority basis.
 - Develop a **digital platform for service providers** to report market access issues.
 - **For example**, implement a system similar to the **EU's Trade Barriers Reporting mechanism**.
 - Set up dedicated service export promotion councils with market-specific strategies.

DILRMP and Digitalisation of Land Records

Why in News?

As of 2024, **98.5% of rural land records** have been digitized, marking a significant milestone in India's efforts toward **land reforms and transparency**.

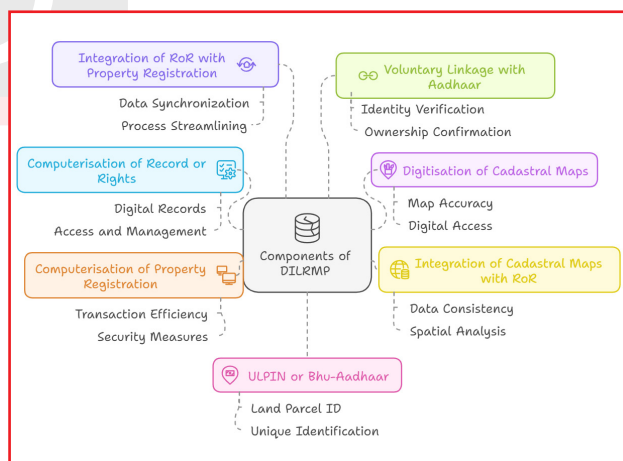
- This achievement is part of the **Digital India Land Records Modernization Programme (DILRMP)**, launched in 2008, which aims to **digitize and modernize agricultural land records** to enhance accessibility and reduce disputes.

Note:

- The **Survey of Villages and Mapping with Improved Technology in Village Areas (SVAMITVA) scheme** to create **land records for inhabited areas** is meant to address land-related disputes, **help villagers take bank loans against their properties** and aid gram panchayats in development planning and collecting property tax.

What is Digital India Land Records Modernization Programme (DILRMP)?

- **About:** The **National Land Record Modernization Programme (NLRMP)** was revamped and renamed as **the Digital India Land Records Modernization Programme (DILRMP)** in 2016 as a **central sector scheme** with 100% funding by the Centre.
 - The NLRMP was a **centrally sponsored scheme** that was launched in 2008 with the aim to modernize the land records system in the country and implement the **conclusive land-titling system** with title guarantee.



- **Key Initiatives Under DILRMP:**
 - **Unique Land Parcel Identification Number (ULPIN):** The ULPIN or "Bhu-Aadhar" provides a **14-digit alphanumeric code for each land parcel**, based on its geo-coordinates.
 - Implemented in 29 States/UTs, it helps **streamline real estate transactions**, resolve property disputes, and improve disaster management efforts.

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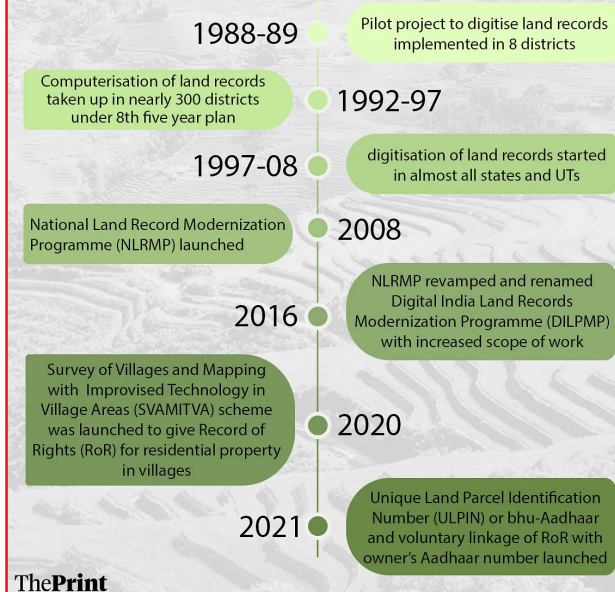
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Note:

- **National Generic Document Registration System (NGDRS):** NGDRS or e-Registration provides a uniform process for deed/document registration across the country, allowing online entry, payments, appointments, and document searches.
 - So far, 18 States/UTs have adopted it, and 12 others share data with the national portal.
- **e-Court Integration:** Linking land records with e-Courts aims to provide authentic land information to the judiciary, aiding in faster case resolution and reducing land disputes. Integration has been cleared in 26 States/UTs.
- **Transliteration of Land Records:** To overcome language barriers in accessing land records, the program is transliterating land documents into any of the 22 languages listed in Schedule VIII of the Indian Constitution.
 - This is already in use in 17 States/UTs.
- **Bhoomi Samman:** Under this initiative, 168 districts across 16 States have achieved "Platinum Grading" for completing over 99% of the program's core components, including land record computerization and map digitization.

LAND REFORMS IN RURAL AREAS



Why does India Need a Digitized Land Record Management System?

➤ About:

- The land is a vital resource for India because as per the **Economic Survey 2023-24**, more than **45% of India's workforce** is employed in agriculture necessitating a modern and transparent land record management system.
 - In 2008, the government launched the **NLRMP**, which was renamed DILRMP in 2016.

➤ Need For Digitised Land Records:

- **Ensure Equity:** Transparent land records enable fair land reforms, benefiting the **landless and marginalized**.
 - They also empower **women and vulnerable groups** by securing their land rights and access to related services.
- **Reduce Litigation:** Land disputes **dominate court cases** in India, consuming time and money. Transparent land record management can **minimize disputes** by ensuring clear, **government-backed ownership rights**.
- **Promote Development:** Land is a key asset for investment and growth. Streamlined land record systems **reduce transaction risks**, encourage investments, and help **landowners leverage titles** for credit and insurance.
- **Improve Transparency:** India's land records are often **outdated and scattered**. Digitizing and integrating them with spatial and other databases like **Aadhaar** can enhance **accuracy and accessibility** while also addressing the problem of **benami properties**.

➤ Benefits of DILRMP (Digitisation of Land Records):

- **Improve Land Records Quality:** The DILRMP **digitizes and updates land ownership** and transaction records, making them **accessible online** to enhance accuracy, reliability, and transparency.
- **Reduce Litigation and Frauds:** The DILRMP aims to establish a **conclusive land-titling system with government-backed title guarantees**, ensuring undisputed ownership, indemnity against title defects, and reduced land disputes and frauds in India.

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Note:

- **Promote Development and Growth:** The DILRMP facilitates **efficient land markets**, **reduces transaction risks**, enables credit access using land titles, and promotes investment, industrialization, and sectoral growth in agriculture, infrastructure, and housing.

Note:

- The **Uttar Pradesh government** has introduced a feature on its land records portal, **UP Bhulekh**, providing information about **bank loans taken against land** in rural areas.

What are the Challenges

Associated with Land Record Digitisation?

- **Language and Dialect Barriers:** India's **linguistic diversity** can hinder rural populations' **understanding of digitization**, as farmers and landowners struggle with digital systems not available in their **native languages**, causing confusion and resistance.
- **Community Shareholdings:** In many **northeastern states**, community-based land ownership complicates digitizing and standardizing land records, as **traditional practices often conflict** with formal titling systems, leading to disputes.
- **Lack of Awareness:** The DILRMP relies on **active participation from stakeholders** like landowners, buyers, sellers, and tenants, but lacks awareness and sensitization about its benefits and procedures among them.
- **Quality of Land Records:** Unclear land titles and outdated cadastral maps hinder accurate records, which **NITI Aayog** emphasizes are crucial for effective planning and property rights clarity.
 - **Cadastral maps** often don't show **land subdivisions between families or villages** because ownership changes aren't updated in revenue records, causing widespread issues.
- **Complexity of Land Management Systems:** India's complex land management systems, involving multiple departments and regulations, hinder seamless digitization and stakeholder alignment.
- **Lack of Resources:** The DILRMP faces challenges due to **insufficient funds, staff, infrastructure**, requiring

enhanced resources and **capacity-building** to modernize land records effectively.

Tapping Renewable Energy Potential in India

Why in News?

Recently, the Ministry of New and Renewable Energy has asked states to ease **land availability** for **renewable energy** projects with a focus on **wind power**.

- With a current **wind power** capacity of **47.95 GW**, the government aims to **double it to 100 GW** and enhance land access to reach the **500-GW non-fossil energy target** by 2030.

What is Renewable Energy?

- **Renewable Energy:** Renewable energy is energy derived from natural, replenishable sources such as **solar**, **wind**, **hydropower**, **biomass**, **geothermal**, and **tidal**.
 - These sources are sustainable and environmentally friendly, reducing dependence on **fossil fuels**.
- **Types:**
 - **Solar Energy:** Harnessed from the sun's radiation using **solar panels** or **solar thermal systems**.
 - **Wind Energy:** Generated by converting the **kinetic energy of wind** into electricity with **wind turbines**.
 - **Hydropower:** Produced by harnessing the energy of **flowing water** (rivers, dams, waterfalls).
 - **Biomass Energy:** Created from **organic materials** like plant residues and animal waste for heating, electricity, and **biofuels**.
 - **Geothermal Energy:** Derived from **Earth's internal heat** (hot water, steam) for **electricity generation** and direct heating.
 - **Tidal & Wave Energy:** Uses **ocean water movement** (gravitational pull or surface waves) to generate electricity.

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Note:

What is the Status of Renewable Energy in India?

- **Renewable Energy Capacity:** As of November 2024, India's total installed renewable energy capacity stands at **158.55 GW**, showcasing significant strides in transitioning to cleaner energy sources.
- **Wind Power:** Wind Power accounts for **47.96 GW**, with **2.07 GW** added during FY 2024-25.
- **Solar power:** **Solar power** in India leads with an installed capacity of **94.17 GW**, including **15.16 GW** from **grid-connected rooftop solar** and **4.10 GW** from off-grid solar solutions.
- **Hydro Power:** **Small Hydro Power** has an installed capacity of **5.08 GW**, focusing on utilizing river streams for clean energy.
- **Biomass Energy:** **Biomass Energy** contributes a combined total of **10.72 GW**, with **9.80 GW** from bagasse-based cogeneration and **0.92 GW** from non-bagasse-based cogeneration.
- **Waste-to-Energy:** **Waste-to-Energy** projects, including off-grid systems, contribute **0.61 GW**, emphasizing efforts to utilize waste for sustainable energy generation.

What is India's Potential in Renewable Energy ?

- **Solar Energy:** With over **300 sunny days** annually, the **National Institute of Solar Energy (NISE)** estimates its potential at **748 GW**, assuming **3% of wasteland** is covered by **Solar PV modules**.
 - States like Rajasthan, Gujarat, and Tamil Nadu lead in solar energy development, with massive solar parks contributing to the national grid.
- **Wind Energy:** India's wind energy potential exceeds **300 GW**, primarily concentrated in **Tamil Nadu, Gujarat, Maharashtra, Andhra Pradesh, and Karnataka**.
 - Emerging offshore wind projects in coastal areas, such as Gujarat and Tamil Nadu, could significantly boost capacity.
- **Hydro Energy:** India has an estimated more than **148 GW** of hydroelectric potential, of which **46 GW** remains untapped.
 - Small hydropower plants (<25 MW) offer **20 GW** of potential, particularly in the Himalayan and northeastern regions.

- **Geothermal Energy:** India has significant geothermal potential, with notable sites in **Ladakh, Himachal Pradesh, and Jharkhand**, capable of generating **10 GW**.
 - Projects in **Puga Valley (Ladakh)** highlight the untapped potential of geothermal energy.
- **Ocean Energy:** Seawater stores **tidal, wave and Ocean thermal energy**. Among them, the harnessing of **40GW wave energy** is possible in India.
 - Coastal areas such as the **Gulf of Kutch** and the **Sundarbans** offer tidal energy potential.

What are Challenges in Expanding Renewable Energy Including Wind Energy in India?

- **Land Scarcity and Use Conflicts:** The renewable energy sector, especially wind sector faces challenges in accessing land and ideal wind sites, especially in densely populated or ecologically sensitive areas.
 - **Farmers and local communities** are resistant to reallocating land for wind energy projects.
 - Consolidating suitable parcels of land is particularly challenging in states such as **Gujarat, Maharashtra, and Tamil Nadu**, where land is often divided among multiple owners.
- **Financing and Investment Issues:** Wind energy projects have substantial upfront capital requirements. Uncertainty in returns and long payback periods deter private investors.
- **Grid Integration and Curtailments:** Wind power's intermittent nature and **seasonal wind patterns** cause supply instability, with grid curtailments during peak seasons reducing profitability.
- **Exhaustion of High-Quality Sites:** Many prime locations with optimal wind speeds are already occupied, forcing new projects into less viable areas.
- **Approval Delays and Policy Gaps:** Wind projects face prolonged delays in obtaining environmental, **wildlife and forest clearances**.
 - The lack of **consistent financial incentives** or long-term policies reduces investor confidence.
- **Offshore Wind Challenges:** Offshore wind potential remains untapped due to high installation costs, advanced technology needs, and limited government support.

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Note:

What is India's Initiative to Boost Renewable Energy?

- [Pradhan Mantri Kisan Urja Suraksha Evam Utthaan Mahabhiyan \(PM-KUSUM\)](#)
- [PLI Scheme for Solar PV Modules](#)
- [Pradhan Mantri Suryodaya Yojana](#)
- [Solar Parks and Ultra Mega Solar Power](#)
- [Green Energy Corridor Scheme](#)
- [National Green Hydrogen Mission](#)
- [National Bioenergy Programme](#)
- [FDI in Renewable Energy](#)

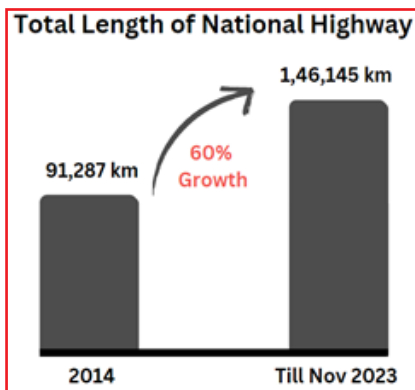
India's Journey of Infrastructure Development

Why in News?

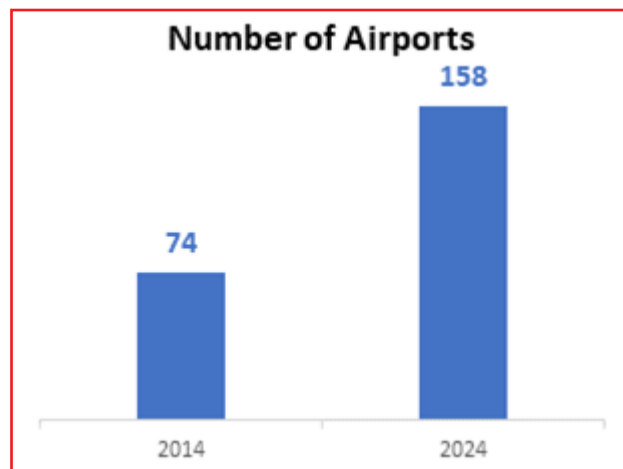
India's infrastructure has transformed over the past 25 years, with increased progress and private participation. However, challenges remain as 90% of the required infrastructure is yet to be built to reach its USD 30 trillion economy goal by 2047.

What are India's Achievements in the Infrastructure Sector by 2024?

- **Roads and Highways:** Road network nearly tripled to 146,000 km since 2000, featuring modern access-controlled expressways and [GPS-based toll systems](#).
 - Since 2014, the government has built 3.74 lakh km of rural roads, connecting over 99% of rural habitations and improving accessibility.
 - Toll collections reached Rs 2.1 trillion, over 25 years, reflecting robust private sector participation.



- **Railways:** India's first bullet train project, with trainsets capable of running at 280 km/h is set for completion by 2026.
 - As of December 2023, 93.83% of the [broad-gauge tracks](#) (called large line and distance between the two tracks is 5 feet 6 inches) were electrified, up from 21,801 km in 2014.
 - A reduction in consequential accidents over the past decade despite several high-profile incidents like the Kanchenjunga Express crash.
- **Maritime Sector:** India plans to invest Rs 54 trillion to become a top-five shipbuilding nation by 2047.
 - Mega ports like [Galathea Bay](#) and the [India-Middle East-Europe Economic Corridor](#) are being developed to boost trade connectivity.
 - The government has launched 839 [Sagarmala projects](#), including port modernization and coastal connectivity, with an investment of Rs 5.8 lakh crore.
- **Aviation:** Weekly domestic flights increased from 3,568 in 2000 to 22,484 in 2024.
 - Low-cost carriers like IndiGo dominate the market, democratizing air travel for millions.
 - Orders for over 1,000 planes from Air India and IndiGo signal long-term growth.
 - The total number of operational airports stands at 158, with 84 airports constructed between 2014 and 2024.



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Note:

- **Urban Metro:** The metro network has grown from 248 km in 2014 to 945 km by 2024, serving 21 cities and 1 crore daily passengers.
 - The **Namo Bharat train** on the **Delhi-Meerut RRTS corridor** enhances regional connectivity and urban transport.
- **Ropeways Development:** The **Parvatmala Programme** has seen the initiation of 32 ropeway projects, enhancing connectivity in difficult terrains and reducing urban congestion.

Note: India ranked 38th in the World Bank's Logistics Performance Index (LPI) 2023.

What are the Challenges in India's Infrastructure Sector?

- **Stalled and Delayed Projects:** The Rs 10 trillion Bharatmala Project was shelved due to red tape, while the Rs 20 trillion **Vision 2047 plan** has been deferred following a policy shift.
 - Financial constraints and underutilization of resources hinder large-scale projects like the **Delhi-Mumbai Expressway** and the **India-Middle East-Europe Economic Corridor**.
 - India needs significant investments to become a USD 30 trillion economy by 2047, with 90% of infrastructure still to be built.
- **Sluggish Progress:** Railway route expansion has been slow, with only 231 km of new tracks added annually on average since 2000, reflecting less than a kilometer per day.
 - Contract awarding for highway projects fell drastically, with only 1,152 km awarded by August 2024, a historic low.
- **Private Sector Dependency:** While private sector involvement has grown, the **recycling of capital** for projects remains a challenge.
 - Toll collection has raised **equity concerns**, with private corporations receiving Rs 1.4 trillion of the Rs 2.1 trillion collected since 2000.
 - **Recycling of capital** is a strategy of selling non-core or underperforming assets and reinvesting in more profitable opportunities.

- **Maritime Disruption:** The maritime sector struggles to meet its 2047 goal of becoming a top-5 shipbuilding nation, hindered by **Ukraine** and **Gaza** wars and the collapse of the global supply chain.
- **Aviation Sector Bottlenecks:** Intense competition has led to the **bankruptcy** of several airlines, including Jet Airways, Kingfisher Airlines, and Go First.
 - Market consolidation between **IndiGo** and **privatised Air India** limits competition and poses risks of **monopolistic** tendencies.

What are Government Initiatives for Infrastructure Development?

- **PM Gati Shakti Scheme**
- **Bharatmala scheme**
- **National Infrastructure Pipeline (NIP)**
- **Sagarmala Project**
- **Ude Desh Ka Aam Nagrik (UDAN)**

Business Ready (B-READY) Report 2024

Why in News?

Recently, the **World Bank** launched the **Business Ready (B-READY) report 2024** to replace the **Ease of Doing Business report**.

- The **Ease of Doing Business** report was paused in 2020 due to **data manipulation** issues and **concerns over the integrity** of certain rankings, leading to an independent review and methodology changes.

What is Meant by Business Ready?

- **Benchmarking Tool:** B-READY evaluates the global business climate to promote **inclusive private sector growth**.
- **Ten Core Topics:** B-READY is organized around key topics for private sector development, covering the stages of a firm's life cycle, including market entry, operation (or expansion), and closure (or reorganization).
 - Ten Core topics covers **Business Entry, Business Location, Utility Services, Labor, Financial Services, International Trade, Taxation, Dispute Resolution, Market Competition, and Business Insolvency**.

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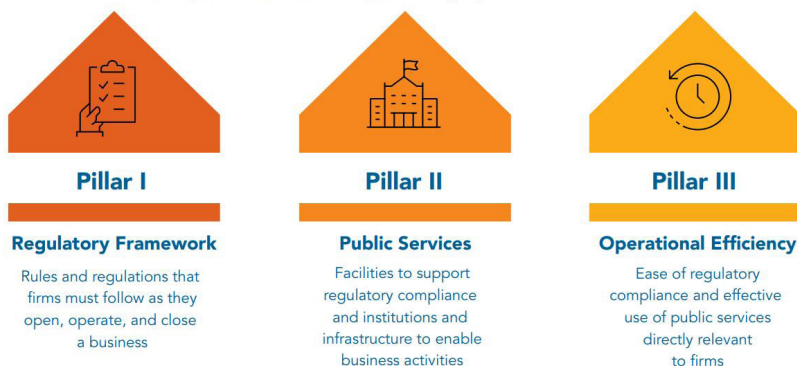
- **Pillars of B-READY:** For each topic, B-READY considers three pillars.
 - **Pillar I: Regulatory Framework** – Focuses on the **rules and regulations firms must follow during their life cycle**, highlighting those that support clarity, fairness, and business sustainability, and those that hinder **entrepreneurship**.
 - **Pillar II: Public Services** – Covers **government-provided services** and infrastructure that support regulatory compliance and business activities, with an emphasis on **digitalization, interoperability, and transparency**.
 - **Pillar III: Operational Efficiency** – Measures **how easily firms can comply with regulations** and utilize public services relevant to their operations.
- **Indicators:** B-READY analyzes **1,200 indicators** to identify policy reform opportunities, using data from primary sources to highlight key aspects of each topic.
- **Three Themes:** B-READY assesses **three key themes** across 10 topics.
 - **Digital Adoption:** Evaluates **digital integration** by governments and businesses in the business environment.
 - **Environmental Sustainability:** Analyzes regulatory provisions affecting business operations with a focus on **sustainability**.
 - **Gender:** Examines the collection of gender-disaggregated data and the implementation of **gender-sensitive regulations** and programs.
- **Scoring:** B-READY generates **two sets of scores** for each economy.
 - **Topic Scores:** Averaged from scores across the three pillars, based on indicators that reflect firm flexibility and social benefits.
 - **Pillar Scores:** Averaged from **scores across 10 topics**, standardised to range from **0 to 100**.
- **Data Collection:** B-READY collects data through **expert questionnaires** for regulatory and public service aspects, and through **World Bank Enterprise Surveys** for operational efficiency, with updates to expert data annually and firm-level data every three years.
- **Global Expansion:** Covers **50 economies** in 2024, with plans to reach 180 by 2026.
- **Focus on Reform:** B-READY shifts focus to **inclusivity, sustainability, and efficiency** in evaluating business environments.

B-READY topics correspond to various stages of the life cycle of a firm and examine three cross-cutting themes



Source: B-READY project.

B-READY pillars define the scope of the project



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Note:

Comparison of Ease of Doing Business and the B-READY Index

Aspect	Ease of Doing Business (EoDB)	B-READY Index
Objective	Focused on evaluating the regulatory environment for SMEs .	Holistic evaluation of private sector development, including SMEs, workers, and consumers .
Scope	Primarily regulatory burden.	Covers regulatory burden, quality of regulations, and public services .
Topics Covered	Limited to a few key topics like starting a business, getting credit, and paying taxes.	Comprehensive: Covers 10 topics spanning a firm's lifecycle, including business entry, utility services, labor, and market competition .
Framework	Focused mainly on ease of doing business for firms.	Includes firm flexibility (ease of business) and social benefits (impact on society) .
Data Collection	Relied on expert consultations and case studies.	Combines expert consultations and firm-level surveys for a balanced de jure and de facto perspective .
Indicators	Used around 11 questionnaires covering a limited number of indicators.	Uses 21 questionnaires and nearly 1,200 indicators for detailed insights.
Scoring and Ranking	Produced aggregate rankings and scores, often criticized for oversimplification .	Provides disaggregated scores by topic and pillar, encouraging targeted reforms rather than overall rankings .
Geographic Coverage	Covered the main business city in 191 economies .	Plans to expand to 180 economies by 2026 , with a focus on national and local regulations.
Public Services	Limited attention to public services.	Explicitly evaluates public services and their operational efficiency.
Cross-Cutting Themes	Did not include specific themes.	Focuses on digital adoption, environmental sustainability, and gender equality .
Use of Results	Primarily for regulatory benchmarking and reform motivation.	Provides actionable insights for reforms, transparency, and data reproducibility.
Methodology Updates	Static methodology with minor updates over time.	Dynamic methodology that evolves based on feedback and lessons from rollouts.

What are the Global Findings of B-READY Report 2024?

- **Public Services Gap:** Economies often enact strong regulations but falter in providing the public services needed for their effective implementation, creating a significant “**public services gap**.”
- **Inclusivity Across Income Levels:** High-performing economies like **Rwanda, Georgia, and Colombia** prove that robust regulatory frameworks and operational efficiency are achievable across income levels.
- **Digital and Environmental Practices:** Economies that **integrate digital tools** and prioritize green initiatives achieve higher scores, reflecting the importance of modern practices.
- **Balanced Development Needed:** Even high-income economies like **Estonia and Singapore** show scope for improvement in areas like **taxation** and dispute resolution, emphasizing the universal need for reforms.

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Note:



India Specific Observations of think tank Global Trade Research Initiative (GTRI)

- **India did not participate in the 2024 B-READY Report.** However, there are some India-specific observations by the think tank GTRI.
 - **Moderate Score in Business Entry:** India's business registration system is **time-consuming** and lacks complete **digital integration**.
 - Countries like **Singapore** achieve one-day online registration with minimal costs, setting a global benchmark.
 - **Challenges in Labor Regulations:** Despite introducing **four labor codes**, India faces slow and uneven implementation across states, affecting **labor market flexibility** and compliance ease.
 - **Trade Inefficiencies:** India's customs processes are marred by delays, inconsistent enforcement, and high logistics costs, unlike Germany and Singapore, which excel in **trade facilitation**.

- **Low Score in Business Location:** Regulatory inconsistencies and approval delays hinder the establishment of business facilities, affecting investment decisions.
- **Positive Aspects:** India is expected to perform well in the three core pillars of B-READY, highlighting strengths in **operational and regulatory areas**.

What are the Recommendations in the Business Ready (B-READY) Report 2024?

- **Streamline Business Operations:** Simplify and digitize **business registration, regulatory approvals, and customs processes** to reduce delays, lower costs, and enhance efficiency, inspired by models like Singapore's single-day registration system.
- **Strengthen Public Services and Digital Transformation:** Invest in **key public services** such as tax portals, utility access, and dispute resolution mechanisms while promoting **digital tools** to improve compliance and operational efficiency.
- **Promote Sustainability and Inclusivity:** Develop policies that encourage **environmentally sustainable business practices** and enforce **gender-sensitive regulations** to foster inclusivity and align with global climate goals.
- **Facilitate Peer Learning and Collaboration:** Encourage economies to share knowledge and learn from **best-performing countries** like Singapore, Rwanda, and Estonia to adopt innovative practices in regulatory and operational frameworks.
- **Adopt Tailored Reforms:** Design **customized policy frameworks** that address unique local challenges while adhering to global standards for inclusive and balanced economic growth.



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Note:

International Relations

Highlights

- India's Humanitarian Assistance to Cuba
- India's Engagement with Taliban
- Pravasi Bharatiya Divas (PBD)
- Strengthening India-Maldives Defence Cooperation
- Quad Marks 20 Years of Cooperation
- H-1B Visa Program

India's Humanitarian Assistance to Cuba

India has sent humanitarian aid to Cuba following the devastating impact of **Hurricane Rafael**.

- India's aid aligns with its **philosophy of Vasudhaiva Kutumbakam (the world is one family)** and its commitment to global solidarity and support for nations in crisis.

Cuba

- Cuba is located in the **Northern Caribbean Sea** at the confluence of the **Gulf of Mexico and Atlantic Ocean**. Its capital, **Havana**, is the country's largest city and a key economic, commercial, and industrial hub.
- Cuba is the **9th largest producer of Nickel**.



How Have India-Cuba Bilateral Relations Been?

- **Historical Background:** India was among the **first countries to extend recognition** to the new Cuban

government following the **Cuban revolution** (overthrow of US backed Fulgencio Batista's dictatorship) in **January 1959**.

- The country was a point of contention during the **Cold War** between the **Soviet Union and the US**, mainly during the **Cuban Missile Crisis of 1962**.
- Both countries have supported each other in international forums, such as the **United Nations (UN)**, **NAM**, **WTO** etc.
- Additionally, Cuba backs **India's bid for a permanent seat** on the **UN Security Council** and India has **consistently advocated** for the **rights and development of Cuba** on international platforms, including addressing economic challenges faced by the nation.
- **Economic Relations:** India's exports to Cuba In FY 2022-23 increased to **USD 79.04 million**, while imports stood at **USD 4.87 million**.
 - Exports from India include pharmaceuticals, chemicals, medical equipment, and textiles. Cuba **exports tobacco and pharmaceutical products** to India.
- **India's Assistance to Cuba:** India has provided **disaster relief**, including aid after **hurricanes in 2008, 2016, and 2017**. **IT Centre (India-Cuba Knowledge Centre)** established in 2010 and training over 1900 professionals in Cuba.
 - India provided **life-saving medicines** during the **Covid-19** pandemic.
 - Cuba is a member of the **International Solar Alliance (ISA)**, with Indian assistance for energy projects.
 - India has extended five **LoCs to the tune of USD 243 million** to the Government of Cuba in agriculture, agro-food, and renewable energy sectors.

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Note:

- **Cultural Relations:** India's culture is highly appreciated in Cuba, with prominent figures like **Mahatma Gandhi**, **Jawaharlal Nehru**, and **Rabindranath Tagore** celebrated.
 - In May, 2007, a bust of Rabindranath Tagore donated by **the Indian Council for Cultural Relations (ICCR)** was unveiled in Old Havana.
 - Yoga and Ayurveda are popular, with events held annually, including the **International Day of Yoga**.

India's Engagement with Taliban

Why in News?

India's **Foreign Secretary** held talks with Afghanistan's acting **Foreign Minister** in Dubai amid global **geopolitical instability**.

- It is **India's highest-ranking outreach** with the Taliban rulers of Afghanistan to secure **India's national and security interests**.

What are the Key Outcomes of the Talks?

- **Expanding Humanitarian Assistance:** India agreed to **expand** its involvement by taking on **development projects** alongside ongoing humanitarian aid.
 - So far, India has sent **50,000 MT of wheat**, **300 tons of medicines**, **earthquake aid**, pesticides, polio and **Covid-19 vaccine** doses, hygiene kits, winter clothing, and stationery.
- **Sports Cooperation:** The two sides discussed strengthening **sports cooperation**, specifically in **cricket**, which holds significant value for Afghanistan's youth.
- **Chabahar Port:** Both parties agreed to promote the use of the **Chabahar port** as a key gateway to support **trade, commercial activities**, and the delivery of humanitarian aid to Afghanistan.



- **Security Concerns:** The Afghan side recognized **India's security concerns** and agreed to remain in touch at various levels.

What Factors were Responsible for Recent India-Afghanistan Talks?

- **Changing Global Dynamics:**
 - **Change in Taliban-Pakistan Relations:** **Pakistan**, once an ally of the Taliban, has become a source of **tension** for Taliban.
 - It prompted India to **engage with the Taliban** to prevent losing out on its interests in Afghanistan.
 - **Iran's Preoccupation:** Iran suffered a blow as **Israel** dominated **Hezbollah** and **Hamas**, and launched **missile attacks** on Iran. Iran is more focused on **deterring Israel** than dealing with the Taliban in Afghanistan.
 - **Hamas** and **Hezbollah** are Iran's proxies who are fighting against Israel.
 - **Russia's Strategic Shift:** Russia has been caught up with its **war in Ukraine**, and has been trying to **build bridges with the Taliban**.
 - Russia views **Islamic groups** from Afghanistan like **ISIS** as a major **security threat** and considers the Taliban an **ally** in fighting terrorism after the **Syrian regime** fell in December 2024.
 - **China's Influence:** China calls for lifting the freeze on **Afghanistan's central bank assets** and is involved in **urban development projects** in Kabul. China eyes Afghanistan's natural resources for its **Belt and Road initiative**.
 - India tries to prevent China's dominance in Afghanistan which can **undercut India's interest**.

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Note:

- **Return of Donald Trump:** There are concerns that the **US might re-engage** with the Taliban and India sees this as an opportunity to ensure its interests remain **central to any future Afghan developments**.
- **Security Concerns:** India has urged Taliban to check anti-India elements operating from Afghanistan such as **Lashkar-e-Taiba (LeT), Jaish-e-Mohammed (JeM)** and **Islamic State Khorasan Province (ISKP)**.
- **Development Engagement:** Taliban officials had said India's projects – estimated to be of **USD 3 billion in the last 20 years** – have been **extremely productive** and they would like India to **stay invested** in Afghanistan.

Note: New Delhi does **not officially recognise the Taliban regime** in Afghanistan but maintained a **technical mission** in Kabul.

- India's technical mission in Kabul is part of its **diplomatic presence** in Afghanistan, focusing on **developmental and humanitarian efforts** rather than **full-fledged diplomatic functions**.

India-Taliban Relations

- **Taliban Rule (1996-2001):** India did **not establish formal diplomatic ties** with the Taliban.
 - India supported the **Northern Alliance**, an opposition group to the Taliban.
 - The Taliban assisted India in negotiating with the **hijackers of Indian Airlines Flight 814 in 1999**, facilitating the safe return of the hostages.
- **Pre Afghanistan Takeover (Before 15th August 2021):**
 - **Moscow Dialogue (2017):** **Moscow Dialogue** brought together representatives from **Afghanistan, China, India, and other stakeholders** to facilitate the **reconciliation process** in Afghanistan.
 - **Intra-Afghan Peace Talks (2020):** India participated in the **intra-Afghan peace talks** in Doha, marking a key step in its engagement with the Taliban.
- **Post Afghanistan Takeover (After 15th August, 2021):**
 - **First Engagement (August 2021):** India's Ambassador to Qatar met Taliban representatives at their **Doha office**.

- **Continued Engagement (June 2022):** Joint Secretary for Pakistan, Afghanistan, and Iran met key Taliban leaders paving the way for sending a **technical team** at the Indian embassy in Kabul.
 - The technical team allows Indian officials to meet with **Taliban ministers and representatives** in Kabul.
- **Afghan Consul General in Mumbai:** India allowed the Taliban to appoint a new **Consul General in the Afghan Consulate in Mumbai**.

What is the Importance of Afghanistan for India?

- **Bridge to Central Asia:** Central Asia holds significant **economic and energy resources**, and Afghanistan offers India a **route via chabahar port** to access these resources while **avoiding reliance on Pakistan and China**.
 - Afghanistan shares a border with **Pakistan, Iran, Turkmenistan, Uzbekistan, Tajikistan, and China**.



- **Countering Pakistan's Influence:** By maintaining influence in Afghanistan, India can strengthen its role in the region and enhance its **strategic position in South Asia and Central Asia**.
- **Counter-Terrorism:** India's involvement in Afghanistan **assert its leadership** in the fight against **terrorism and extremism** in South Asia.
- **Mutual Benefits:** India has invested over **USD 3 billion** in various projects in Afghanistan, such as **roads, dams, schools, hospitals, parliament building**, etc which can facilitate **better living for Afghan people** and provide mutual benefits to Indians and Afghans.

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Note:

What are Challenges for India's Taliban Policy?

- **Terrorism:** The fall of Afghanistan's democratic government **destabilized the country** and **strengthened** extremist networks like the **Haqqani Network**, **al-Qaeda**, and **Lashkar-e-Taiba**, which have targeted India through **cross-border terrorism**.
 - E.g., The presence of **terrorist groups** may work against **India's interests** posing threats to **India's security**.
- **Pakistan's Strategic Role:** Pakistan perceives India's presence in Afghanistan as a **direct threat to its strategic depth policy**, which aims to use Afghanistan as a **buffer against India**.
 - Pakistan accuses India of **supporting insurgencies in Balochistan** and other regions.
- **Diplomatic Recognition:** India has **not officially recognized the Taliban regime** due to its refusal to form an **inclusive government, respect human rights, and curb terrorism**, complicating diplomatic engagement.
- **Refugee Crisis:** The fall of Kabul caused an **influx of Afghan refugees** to India, straining resources and raising concerns about security, integration, and **potential radical elements among them**.

Pravasi Bharatiya Divas (PBD)

Why in News?

Pravasi Bharatiya Divas (PBD), observed biennially on **9th January**, is a noteworthy event that celebrates the contributions of the **Indian diaspora** to their homeland.

- The **18th PBD Convention** is being organised by Odisha from **8th to 10th January 2025**, with the theme '**Diaspora's Contribution to a Viksit Bharat**' (Developed India).

What is Pravasi Bharatiya Divas (PBD)?

- **Background & History:** This bi-annual celebration commemorates the day in **1915** when **Mahatma Gandhi**, the greatest Pravasi (migrant), **returned to India from South Africa** to lead the country's **freedom struggle**.

➤ Primary Goals of PBD:

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

➤ PBD Conventions:

- The **PBD Convention** was **first established in 2003** under the government of then Prime Minister Late **Shri Atal Bihari Vajpayee**, as a platform to recognise and engage with the overseas Indian community.
- **18th PBD Convention, 2025:**
 - During the Convention, the Prime Minister of India **inaugurated the Pravasi Bharatiya Express**, a special tourist train for the Indian diaspora.
 - The Pravasi Bharatiya Express was **conducted under the Pravasi Teertha Darshan Yojana** of the **Ministry of External Affairs**.
 - An exhibition was also inaugurated to showcase rare documents of people who **migrated from Mandvi in Gujarat to Muscat in Oman**.
 - PM highlighted the **significance of Girmityas** (indentured laborers from pre-independent India) who were **sent to countries like Fiji, Mauritius, Trinidad and Tobago, and others**.
 - It was also suggested to create a **comprehensive database of the Girmityas**.

➤ Pravasi Bharatiya Samman Award (PBSA):

- The award, given out as part of the Pravasi Bharatiya programme, is the **highest honour** conferred on a **Non-Resident Indian (NRI)**, **Person of Indian Origin (PIO)**; or an organisation or institution established and run by them.
- The award is to commemorate the **contribution of the Indian diaspora to create a better understanding of India abroad**, support India's causes and work for the welfare of the local Indian community.

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Note:

What is Diaspora?

➤ Background & Origin:

- The term diaspora traces its roots to the Greek *diaspeiro*, which means dispersion. The Indian diaspora has grown manifold since the first batch of Indians were taken to counties in the east pacific and the **Caribbean islands** under the 'Girmitiya' arrangement as indentured labourers.

➤ Classification of Diaspora:

- **Non-Resident Indians (NRIs):** NRIs are Indians who are residents of foreign countries. A person is considered NRI if:
 - A person is a **non-resident** if they are in India for **less than 182 days in a year** or **less than 365 days** in the preceding 4 years and less than 60 days in the current year.
- **Persons of Indian Origin (PIOs):** PIO refers to a foreign citizen (previously held an Indian passport) who or their parents/grandparents born in India or who is a spouse of a citizen of India or a PIO.
 - Nationals of Pakistan, Afghanistan, Bangladesh, China, Iran, Bhutan, Sri Lanka and Nepal **are not included in the PIO classification.**
 - The **PIO category was abolished in 2015** and merged with the OCI category.
- **Overseas Citizens of India (OCIs):** A separate category of **OCI** was carved out in 2005.
 - An OCI card is **granted to a foreign national** who was eligible for Indian citizenship on **26th January 1950** or belonged to a territory that became part of India after 15th August 1947.
 - Minor children of such individuals, (excluding nationals of Pakistan and Bangladesh), were also eligible for OCI cards.

Geographical Distribution of Overseas Indians

Country	Overseas Indian
USA	5,409,062
UK	1,864,318
UAE	3,568,848
South Africa	1,700,000
Saudi Arabia	2,463,509

Myanmar	2,002,660
Malaysia	2,914,127
Kuwait	995,528
Oman	686,635
Canada	2,875,954

How Indian Diaspora

Can Contribute to Viksit Bharat?

➤ Economic Empowerment and Inclusive Growth:

The Indian diaspora drives economic growth in India through **remittances** and **investments**.

- By connecting Indian businesses to international markets and fostering partnerships, they **enhance India's business ecosystem**, empower underserved regions, and support the nation's goal of becoming a developed economy.

- **For example:** A thorium-based fuel, **ANEEL**, invented by a US based NRI, is set to be implemented in **India for clean nuclear energy.**

➤ Promote Global Trade Linkages:

By **facilitating cross-border partnerships, investment flows**, and knowledge exchange, the diaspora helps expand India's export base, diversify trade relationships, and promote India's products and services globally.

➤ Supporting Innovation Ecosystem:

Diaspora-led trade partnerships in emerging markets also offer **opportunities for mutual growth**. Through shared resources and joint ventures, these partnerships can accelerate India's entry into high-growth global markets, further enhancing its development prospects.

➤ Diaspora's Role in Tackling Global Challenges:

The diaspora's active involvement in promoting and supporting grassroots environmental efforts, and advocating for climate action can significantly contribute to India's global leadership in **sustainable development**.

- By leveraging its international influence, **the diaspora can help shape global policies**, bringing attention to issues that align with India's development goals.

➤ Enhance Cultural Linkages:

The Indian diaspora (act as cultural ambassadors) can **enhance cultural linkages** by promoting Indian traditions, art, and heritage in

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Note:

their host countries through events, festivals, and cultural exchanges.

- Declaring Diwali as a holiday in several states in the US is a **prime example of cultural exchange**.

What are the Challenges

Related to Indian Diaspora?

- **Identity and Integration:** Many members of the Indian diaspora face challenges in balancing their **cultural identity with the pressures of integrating into the societies** they live in. This can lead to a sense of alienation or loss of **cultural heritage**.
- Differences in **cultural values** often lead to conflicts, such as **child custody cases in countries like Norway and Germany**, where local laws may not align with Indian cultural practices and familial norms.
- **Politicization and Religious Phobia:** Increasing instances of politicization and religious bias, especially targeting **Hindus and Sikhs in Western countries like the USA and Europe**, contribute to social alienation and hinder community integration.
- **Legal and Citizenship Issues:** Issues related to **visa status, citizenship rights**, and the complexities of immigration laws can affect the Indian diaspora, particularly in countries with restrictive **immigration policies**.
- The increasing backlash against Indian immigrants in the US over the **H-1B visa** has fueled resentment among Indians, despite their significant contributions.
- **Challenges in Remittances:** Economic instability, exchange rate fluctuations, or banking issues can affect the flow of remittances from the diaspora to India, impacting families who rely on this support.

Government Initiatives Related to the Welfare of Indian Diaspora

- **National Pension Scheme for NRIs**
- **Online Services for Voters**
- **Know India Program**
- **Overseas Citizenship of India (OCI) Card Scheme**
- **Indian Community Welfare Fund (ICWF)**
- Pravasi Bhartiya Kendra
- India Development Foundation of Overseas Indians (IDF-OI)

Strengthening India-Maldives Defence Cooperation

Why in News?

India's Defence Minister Rajnath Singh, during talks with the Maldivian Defence Minister, reaffirmed **India's commitment to enhancing the Maldives' defence capabilities** by providing defence equipment and platforms.

- This move reflects India's **"Neighborhood First" policy** and strengthening bilateral security and defence cooperation between the two nations.



How are India-Maldives Defence Cooperation?

- **Historical Context:** India has been a key defense partner of the Maldives, **often acting as the first responder in times of crisis**. This was demonstrated by **Operation Cactus in 1988**, where India intervened to prevent a coup attempt in the Maldives, and during the **2004 tsunami**.
- The **"Neighborhood First" policy** and **SAGAR (Security and Growth for All in the Region)** vision underline India's proactive approach to fostering regional security.
- **Defence Projects:** India has played a key role in infrastructure projects like the **Composite Training Centre (CTC) for Maldives National Defence Force**

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(MNDF) and the construction of the **Coast Guard "Ektha"** MNDF Harbour and repair facility at **Sifavaru** in **Uthuru Thila Falhu (UTF)** atoll.

- In October 2023, India announced the free refit of the **Maldivian Coast Guard Ship Huravee**, signifying mutual trust.
- India has handed over a **coastal radar system** to the **Maldives**, comprising 10 radar stations built with a USD 15.8 million Indian grant.
- **Training and Capacity Building:** India provides about **70% of the MNDF** training needs, with over **1,500 MNDF personnel trained** in various Indian defence academies.
 - Key bilateral exercises like **"Ekuverin"** and **"Ekatha,"** along with trilateral exercises such as **"Dosti" (including India, Sri Lanka, and the Maldives)** are conducted to enhance operational synergy and interoperability.
- **Institutional Mechanisms:** The **Annual Defence Cooperation Dialogue (DCD)** was initiated in 2016 at the **Defence Secretary level** to discuss and review defence cooperation.
 - The **5th Defence Cooperation Dialogue (DCD)** between India and the Maldives was held in New Delhi in September 2024.

India-Maldives Bilateral Relations

- **Political Relations:** India was one of the first countries to recognize the Maldives post-independence in 1965 and established its **diplomatic mission in Malé in 1972**.
 - They are founding members of **South Asian Association for Regional Cooperation (SAARC)** and signatories to the **South Asian Free Trade Area (SAFTA)**.
- **Trade and Economy:** India and Maldives signed a trade agreement in 1981, boosting bilateral trade.
 - In 2024, India extended **USD 400 million in support** and a **bilateral currency swap** of **Rs 3,000 crore to the Maldives**, reinforcing its economic assistance. Additionally, the **State Bank of India** rolled over **USD 100 million of Treasury Bills** for the Maldives.

- India became the **Maldives' 2nd largest trade partner in 2022 and the largest in 2023**.
- Indian imports mainly include **scrap metals**, while exports cover engineering goods, pharmaceuticals, cement, and agricultural products.
- **Visa-free entry for Indian business travelers in 2022** further enhanced commercial relations.
- In 2024, India and the Maldives have finalized a **framework to promote the use of local currencies** for cross-border trade.
- **Tourism:** Tourism is crucial to the **Maldivian economy**, contributing about a quarter of GDP and nearly **70% of total employment (direct and indirect)**.
 - India became the **largest source of tourists to the Maldives**, with Indians leading tourism contributions for three consecutive years (2020, 2021, and 2022).
 - In March 2022, **India and Maldives agreed to an open skies arrangement** to enhance connectivity between the two countries.

What is the Significance of India-Maldives Cooperation?

- **Geographical Significance:** The Maldives sits at a critical position in the Indian Ocean, acting as a "toll gate" between the western chokepoints (**Gulf of Aden** and **Strait of Hormuz**) and the eastern chokepoint (**Strait of Malacca**).
 - This proximity to major international shipping lanes makes it a crucial partner for India, as around **50% of its external trade and 80% of its energy imports transit through these routes**.
 - The Maldives, located south of India, is crucial for **monitoring maritime traffic and enhancing regional security**.
- **Economic and Social Benefits:** India is a key supplier of essential goods like **rice, medicines, and infrastructure materials**.
 - **India's Operation Neer** delivered around 2000 tonnes of water via **INS Deepak** and **INS Shukanya**, during the **2014 Male Water Crisis**.

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- India's aid during crises, such as **tsunamis and Covid-19**, has reinforced its role as a reliable partner.
- **Countering External Influence:** India's cooperation with the Maldives **counterbalances the growing influence of external powers**, particularly China, in the region, and strengthens India's leadership role in maintaining regional peace.

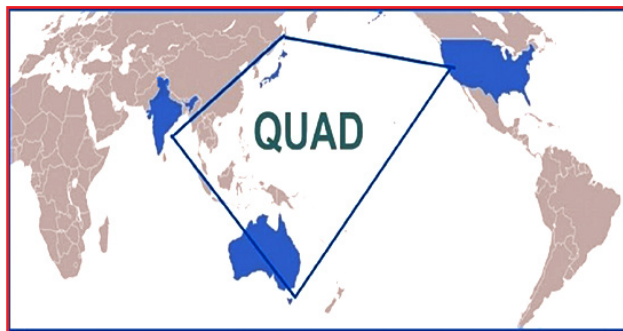
What are the Challenges in India-Maldives Defence Ties?

- **Geopolitical Rivalries:** China's growing influence through initiatives like the **Belt and Road Initiative (BRI)** and the **'String of Pearls'** raises concerns for India.
 - Chinese investments in Maldivian infrastructure, such as the **Sinamale Bridge**, and military agreements challenge India's strategic dominance in the region.
- **Internal Political Changes:** The **"India Out" campaign** in 2023 highlighted rising anti-Indian sentiments in the Maldives, with demands for the **withdrawal of Indian military personnel** and the halting of Indian infrastructural developments.
 - These shifts in Maldivian political leadership have impacted defense priorities and foreign policy alignment with India.
- **Security Threat:** The increasing presence of **radical Islamist groups, including Pakistan-backed jihadi factions and ISIS (Islamic State of Iraq and Syria)**, in the Maldives poses a direct security threat to India, as these groups may use the Maldives as a base to target Indian assets.

Quad Marks 20 Years of Cooperation

Why in News?

The **Quad Foreign Ministers** marked the **20th anniversary of Quad cooperation**, reaffirming their commitment to a **free, open, and peaceful Indo-Pacific** amid China's growing assertiveness.



What are the Key Facts About Quad?

- **About:** Quad, or **Quadrilateral Security Dialogue** is a strategic forum of the **US, Japan, India, and Australia** aimed at regional security and economic cooperation in the Indo-Pacific region.
- **Objectives:** Promoting a **free and open Indo-Pacific**, upholding **democracy, human rights, and rule of law**, and countering China's expanding influence.
- **Formation of Quad:**
 - **2004 Tsunami Origins:** The group's roots lie in the **2004 tsunami** relief efforts when **India, the US, Japan, and Australia** collaborated for rescue operations.
 - **2007 Formation:** The Quad formally emerged in 2007, with **Japanese Prime Minister Shinzo Abe** proposing the idea.
 - **Australia withdrew in 2008** due to Chinese pressure and regional tensions.
 - **Revival in 2017:** Enhanced **US-Australia military ties** led to Australia's return. The first official Quad talks were held in the **Philippines in 2017**.
 - **Malabar Exercise:** The **Malabar exercises** began in 1992 as a bilateral naval drill between India and the US. Japan joined in 2015, and Australia participated in Malabar 2020.
- **Nature of Quad:** The Quad operates without a **formal alliance structure, secretariat, or decision-making body**.
 - The forum is sustained through **regular meetings, including ministerial and leader-level summits**, as well as information exchanges and military drills.

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➤ Key Initiatives of the Quad:

- **Indo-Pacific Partnership for Maritime Domain Awareness (IPMDA):** Enhances real-time monitoring of illegal fishing and maritime activities.
 - **IPMDA** collaborates with regional bodies like the **Pacific Islands Forum Fisheries Agency** and **India's Information Fusion Center–Indian Ocean Region**.
- **Maritime Initiative for Training in the Indo-Pacific (MAITRI):** Supports capacity-building for maritime security and law enforcement training.
- **Indo-Pacific Logistics Network:** Aims to leverage shared **airlift and logistical capacities** for rapid **disaster** response in the region.
- **Quad Cancer Moonshot:** Targets **cervical cancer** prevention and treatment, with plans to save hundreds of thousands of lives over coming decades.
- **Quad Ports of the Future Partnership:** Develops **sustainable and resilient port infrastructure** across the Indo-Pacific, with India hosting a **Regional Ports and Transportation Conference in 2025**.
- **Open Radio Access Networks (Open RAN):** Quad with **Open RAN facilitates** secure and resilient **5G ecosystems**.
- **Advancing Innovations for Empowering NextGen Agriculture (AI-ENGAGE):** Uses **Artificial Intelligence (AI)**, robotics, and sensing to improve agricultural practices and empower farmers in the Indo-Pacific.
- **BioExplore Initiative:** A **USD 2 million project** to leverage AI for biological research, with applications in healthcare, clean energy, and sustainable agriculture.
- **Semiconductor Supply Chain Contingency Network:** Enhances collaboration to mitigate risks in **semiconductor supply chains**.
- **Quad Fellowship:** Funds graduate **STEM (Science, Technology, Engineering, Mathematics)** education in member countries and recently expanded to include ASEAN students.
 - India's Quad Scholarships program supports 50 engineering students from the Indo-Pacific annually.
- **Counter Terrorism Working Group (CTWG):** Focuses on countering the misuse of unmanned aerial systems,

chemical, biological, radiological, and nuclear threats (CBRN), and the internet for terrorist purposes.

What is the Significance of Quad for India?

- **Maritime Security:** Ensures India's maritime interests are safeguarded by promoting freedom of navigation and countering **piracy and illegal fishing**.
 - Joint naval exercises enhance interoperability and maritime domain awareness.
- **Strategic Importance:** Quad provides a platform to address challenges in the Indo-Pacific region, particularly countering China's assertive policies like the **"String of Pearls."**
 - Quad aligns with **India's Act East Policy** to strengthen ties with East and Southeast Asia.
- **Economic Opportunities:** Encourages economic cooperation through initiatives like the **Blue Dot Network and Supply Chain Resilience Initiative**.
 - Post-Covid, India has the opportunity to attract manufacturing units shifting from China, enhancing supply chain resilience in the global economy.
- **Scientific Collaboration:** The Quad Fellowship encourages academic and scientific research in **STEM fields**.
- **People-to-People Ties:** Enhances cultural and academic exchanges, boosting **India's soft power diplomacy**.

What is the Relevance of Quad in Contemporary Global Context?

- **Quad's Continued Relevance**
 - **Strategic Significance:** The Quad remains a crucial platform to **counterbalance China's growing influence in the Indo-Pacific**, particularly in contested regions like the **South China Sea**.
 - The Quad pledged support for the **ASEAN Outlook on the Indo-Pacific, the Pacific Islands Forum, and the Indian Ocean Rim Association**, highlighting its role in collaborating with existing regional frameworks.
 - **Maritime Security:** Initiatives like the **IPMDA** enhance member countries' abilities to monitor illegal activities and protect their **Exclusive Economic Zones (EEZs)**.

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Note:

- **Diverse Agenda:** The Quad addresses multiple issues beyond security, such as **health, technology, infrastructure, and climate change**, showing its adaptability and multi-dimensional focus.
 - Programs like the **Quad Cancer Moonshot, pandemic preparedness initiatives, and climate adaptation** measures demonstrate its practical contributions to regional stability.
- **Institutional Strengthening:** Regular summits, ministerial dialogues, have institutionalized the Quad, ensuring its **sustainability and ability to evolve**.
- **People-Centric Initiatives:** Fellowships, scholarships, and people-to-people ties strengthen the Quad's soft power and build trust in the region.
- **Challenges to Quad's Relevance:**
 - **Lack of formal structure:** The Quad lacks a secretariat, or permanent decision-making body, limiting coordinated action and consensus on critical issues and hampers its ability to address global challenges effectively.
 - **Divergent Priorities:** Quad members have varied national interests. For instance, **India's non-alignment policy** and **reluctance to join formal military alliances** can limit the grouping's strategic cohesion.
 - **Security vs. Development:** While the US and Japan focus heavily on **countering China**.
 - India and Australia majorly emphasize **development-oriented goals**, leading to differing approaches.
 - **China's Growing Influence:** Despite Quad efforts, China's influence in the Indo-Pacific continues to grow, especially through its **Belt and Road Initiative (BRI)** and investments in Pacific Island nations.
 - **Resource Constraints:** Many Quad initiatives require substantial funding and institutional support.
 - Delays or insufficient resource allocation could hinder their implementation and impact.
 - **Overlaps with Other Groupings:** The Quad's objectives often overlap with other multilateral

forums like **ASEAN, Australia, the UK and the US (AUKUS)**, and the **Indo-Pacific Economic Framework (IPEF)**, leading to redundancy and dilution of focus.

H-1B Visa Program

Why in News?

The **H-1B visa** program has recently garnered significant attention amidst political debates. With prominent figures, including **Elon Musk**, have voiced **support for its continuation**, emphasizing its role in addressing the **US's STEM talent shortages**.

What is the H-1B Visa Program?

- **About:** The H-1B is a **non-immigrant visa** which allows US-based companies to **hire and employ foreign workers** for specialty jobs like **science, technology, engineering, mathematics (STEM), and IT** (High skills and at least a bachelor's degree)
 - It was introduced in **1990** to help US employers address **skill shortages** when qualified US workers are unavailable.
 - A **nonimmigrant visa** allows **temporary entry to the US** for purposes like **tourism, business, work, study, or medical treatment**.
- **Visa Duration:** An H-1B visa can be issued for a maximum of **six years**. After this period, the visa holder must either **leave the US** for at least 12 months before reapplying for another H-1B visa or apply for **permanent residence (a Green Card)**.
- **Annual Cap and Exemptions:** Currently, there is a regular annual cap of **65,000 new H-1B visas** each fiscal year.
 - An additional **20,000 visas** are available for applicants who hold a **master's degree or higher** from a US university.
 - Petitions for H-1B visa holders seeking **continued employment** and those seeking **employment at higher education institutions, affiliated nonprofits, or government research organizations** are eligible for cap exemption.

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Note:

- **Dominance of Indians:** People born in India are the largest group of approved H-1B petitions annually **since 2015**.
 - People born in **China rank second**, consistently making up **12-13%** of petitions since 2018.

Other US Nonimmigrant Visa Categories	
Visa Category	Purpose of Travel
O	Foreign national with extraordinary ability in Sciences, Arts, Education, Business or Athletics
H-2A	Temporary agricultural worker
H-2B	Temporary worker performing other services or labor of a temporary or seasonal nature
B-2	Tourism , vacation, pleasure visitor
V	Nonimmigrant Visa for Spouse and Children of a Lawful Permanent Resident

Note: China and India dominate the STEM fields worldwide.

- According to data presented by the **Centre for Security and Emerging Technology (CSET)**, a US based think tank, in 2020, **China (3.57 million)** and **India (2.55 million)** led the world in **STEM graduates**, far surpassing the **US (820,000)**.



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Note:

Social Issues

Highlights

- SC Dismissed Review Petition on Same-Sex Marriage
- Challenges and Developments Related with Denotified Tribes
- Burqa Ban in Switzerland
- Eradicating Manual Scavenging
- Global Nutrition Targets
- Transgender Rights and Related Concerns
- Managing Hazardous Waste
- World Malaria Report 2024
- Global Polio Resurgence

SC Dismissed Review Petition on Same-Sex Marriage

Why in News?

The 5-bench **Supreme Court of India (SC)**, in a recent judgment **rejected review petitions** against its **October 2023 ruling** that had **refused to legalize same-sex marriage**.

- In the October 2023 ruling, the Bench headed by **Chief Justice of India** delivered a 3:2 majority **verdict against granting constitutional validity to same-sex marriages**.

What is Same-Sex Marriage?

- **About:**
 - Same-sex marriages refer to **marriages between two individuals of the same gender**, i.e. marriage between two men or between two women.
- **Legality in India:** India does **not recognize** marriages or civil unions of **same-sex couples**.
- **Supreme Court Judgment 2023:** The Supreme Court (SC) ruled that the **Special Marriage Act (SMA), 1954**, does **not apply to same-sex couples** and held that it is for **Parliament** and **state Legislature** to formulate laws on it.
 - SC held that there is **no fundamental right to marry** under the Indian **Constitution**.
 - However, SC upholds the **right of same-sex couples** to enjoy equal benefits and rights similar

to those of live-in partners, as guaranteed under **Article 21 (Right to Life)**.

Global Status on Recognition of Same-Sex Marriage

- As of 2024, **over 30 countries** worldwide including the US, Australia, Canada and France have **legalized same-sex marriages**.
- The **Netherlands** was the **first country in 2001** to **legalise same-sex marriage** by amending civil marriage law.
- **Taiwan** was the **first country in Asia** to legalize same-sex marriage.
- Several nations, such as **Iran, Afghanistan, Saudi Arabia, and Brunei**, not only prohibit same-sex marriages but also **impose severe penalties**, including the death penalty or corporal punishment.

What is the Special Marriage Act (SMA) 1954?

- **About:**
 - The **SMA, 1954**, provides a **legal framework** for marriage between **individuals of different religions or castes** in India.
 - It governs civil marriages, where the **state sanctions the marriage** instead of religious authorities.
- **Applicability:**
 - The SMA applies to **people of all faiths**, including Hindus, Muslims, Sikhs, Christians, Jains, and Buddhists across India.
 - Under the **SMA, 1954**, **foreigners can also register their marriage** in India if both parties have valid

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Note:

passports and at least one has resided in India for a minimum of 30 days before filing the marriage notice.

➤ Key Provisions:

- **Marriage Recognition:** The Act facilitates the registration of marriages, granting **legal recognition and providing rights** such as **inheritance, succession, and social security benefits**.
- **Notice Requirement:** According to Section 5, the parties must provide **written notice to the Marriage Officer** of the district, with at least one party having resided in the district for a minimum of 30 days prior to the notice.
 - Section 7 allows **objections to the marriage within 30 days** of the notice being published.
- **Age Limit:** The minimum marriage age under the SMA is **21 years for males and 18 years for females**.

What are the Arguments in Favour of Same Sex Marriage?

- **Equality and Human Rights:** Denying same-sex couples the right to marry **creates** second-class status, **violating fundamental rights** under international human rights conventions.
 - The **UDHR** upholds the right to marry as a fundamental human right, emphasizing equality and dignity. In India, activists argue that this aligns with **Article 21 (Right to Life)** of the Constitution.
- **Cohabitation as a Fundamental Right:** The SC in judgments such as ***Lata Singh v. State of UP, 2006*** and ***Shakti Vahini v. Union of India, 2018*** has affirmed **cohabitation as a fundamental right** under **Article 21**, obligating the government to legally recognize relationships between same-sex couples.
- **Legal and Economic Benefits:** Legalizing same-sex marriage provides **equal access to the legal and economic benefits** associated with marriage, inheritance rights, and social security benefits.
- **International Principles:** Same-sex marriage is **legal in more than 30 countries**, aligning with global human rights principles that advocate for equality and dignity for all individuals, irrespective of sexual orientation.

What are the Arguments Against Same-Sex Marriages?

- **Religious and Cultural Beliefs:** Many religious and cultural groups assert that **marriage should be between a man and a woman**, arguing that redefining marriage challenges their foundational values and beliefs.
- **Against Natural Order:** Some oppose same-sex marriage on the grounds that **marriage's primary purpose is procreation**, which they believe same-sex couples cannot fulfill, thus **contradicting the natural order**.
- **Legal and Regulatory Challenges:** Concerns are raised about **potential legal complications**, such as adjustments needed in inheritance, and property laws which could involve complex legal changes.
- **Adoption Issues:** When same-sex couples **choose to adopt children**, they may face societal stigma, discrimination, and adverse effects on the child's emotional and psychological health, particularly in Indian society.

LGBTQIA+ and their Rights in India

- **About:** LGBTQIA+ is an acronym that represents lesbian, gay, bisexual, transgender, queer, intersex, and asexual.
 - The **“+”** represents the **many other identities** that are still being explored and understood. The acronym is constantly evolving and may include other terms like non-binary and pansexual.
- **Recognition of LGBTQIA+ in India:**
 - **2014:** The Supreme Court recognizes **transgender people as a “third gender”** in ***National Legal Services Authority V/s Union of India Case***.
 - **2018:** In a historic decision, the Supreme Court strikes down **Section 377**, decriminalizing same-sex relationships in ***Navtej Singh Johar v. Union of India***.
 - **2019:** The ***Transgender Persons (Protection of Rights) Act, 2019*** was passed, granting legal recognition and prohibiting discrimination against transgender individuals.
 - **2022:** In August 2022, the Supreme Court of India expanded the definition of family to include **same-sex couples and queer relationships**.

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Note:

- **2023:** In October 2023, A five-judge Constitution Bench of the Supreme court rejecting petitions to legalise **same-sex marriage in India**.

Challenges and Developments Related with Denotified Tribes

Why in News?

The **Denotified Tribes (DNTs)**, **Nomadic Tribes (NTs)**, and **Semi-Nomadic Tribes (SNTs)** in India face numerous challenges, including **denial of caste certificates** in most states.

- Despite the Indian Government launching the **Scheme for Economic Empowerment of DNTs scheme (SEED)** for their upliftment, various other issues have led to growing discontent among these communities.

What are the Major Challenges faced by DNTs, NTs, and SNTs?

- **Historical Injustice:** These tribes were labeled **criminal tribes** under the **Criminal Tribes Act, 1871** during British rule, stigmatizing them for generations.
 - Despite being denotified in 1952, the stigma persists, impacting their social and economic inclusion.
 - Historically, Nomadic Tribes and De-notified Tribes **never had access to private land or home ownership**.
- **Unclassified Communities:** The **Idate Commission (2017)** identified a total of **1,526 DNT, NT and SNT communities**.
 - Out of these 1,526 identified communities, **269 communities** are still **unclassified** under the categories of **either SC, ST or OBC**.
 - Similarly, many individuals from these communities are unable to obtain **caste certificates in 29 states**, limiting their access to welfare schemes.
 - **Several estimates** suggest a significant population of **over 25 crore** individuals, yet many lack basic identity recognition.
- **Implementation Gaps:** Recommendations of the Idate Commission, including a **permanent commission** and **caste-census inclusion**, remain unaddressed.

- The **SEED scheme** has seen limited success due to delays and lack of outreach. Overlapping benefits with SC/ST/OBC schemes lead to difficulties in beneficiary identification.

- **Lack of Representation:** Leadership positions remain scarce for DNT communities, with no **full-time chairperson** in the Union government's **Development and Welfare Board for DNTs, SNTs, and NTs (DWBDNC)**.

Idate Commission, 2014

- **About:** It was **established in 2014 under the leadership of Bhiku Ramji Idate**, to compile a statewide catalogue of Denotified, Nomadic, and Semi-Nomadic Tribes (DNTs).
- **Mandate:** It was mandated to recognize those excluded from **Scheduled Castes (SC)**, **Scheduled Tribes (ST)** and **Other Backward Classes (OBC)** categories and recommend welfare measures for their well-being.
- **Recommendations:**
 - Create a **permanent commission** with legal standing for the DNTs, SNTs, and NTs.
 - Assign individuals not identified in the SCs/STs/OBCs list to the OBC category.
 - Enhance legal and constitutional safeguards by incorporating a **third schedule into the Scheduled Castes and the Scheduled Tribes (Prevention of Atrocities) Act, 1989** to prevent atrocities and restore the feeling of security amongst the members of the community.
 - Form a **distinct department to address the welfare** of these communities in states with significant populations.
 - Undertake a thorough **survey of DNT families** to determine their estimated numbers and distribution.

Note: Instead of establishing a **permanent commission** for De-notified Tribes (DNTs), the government set up the **DWBDNC under the Ministry of Social Justice and Empowerment**, citing that a permanent commission would conflict with the existing **National Commissions for SCs, STs, and OBCs**.

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Note:

Who are DNTs, NTs, and SNTs?

- **About:** The term **De-notified Tribes** refers to communities that were once classified under the **Criminal Tribes Acts, 1871** which were implemented by the British Government.
 - The Acts were abolished by the **Government of India in 1952**, leading to the **De-Notification** of these communities.
 - A few of these communities which were listed as **de-notified were also nomadic**.
 - **Nomadic and semi-nomadic** communities are defined as those who **move from one place to another** rather than living in one place all the time.
 - While most DNTs are spread across the **SC, ST** and **OBC** categories, some DNTs are not covered in any of the SC, ST or OBC categories.
- **Distribution:** DNTs encompass a wide range of communities, each with unique cultural practices, languages, and socio-economic conditions. Communities include the **Kanjar, Nat, Pardhi, and Sopera**.
 - South Asia is estimated to have the largest nomadic population in the world. In India, approximately **10% of the population** comprises NTs, SNTs, and DNTs.
 - While there are around 150 De-notified Tribes, the Nomadic Tribes population includes about 500 distinct communities.
- **Major Committees/Commissions for DNTs, NTs, and SNTs Communities:**
 - **The Criminal Tribes Inquiry Committee, 1947** constituted in the United Provinces (now Uttar Pradesh).
 - **Ananthasayanam Ayyangar Committee, 1949**.
 - Criminal Tribes Act, 1871 was repealed based on the recommendation of this committee.
 - **Kaka Kalelkar Commission** (also called first OBC Commission), 1953.
 - **B P Mandal Commission, 1980**.
 - The commission also made some recommendations related to the issue of NTs, SNTs, and DNTs Communities.

- The **National Commission to Review the Working of the Constitution (NCRWC), 2002** held that DNTs have been wrongly stigmatised as crime prone and subjected to high handed treatment as well as exploitation by the representatives of law and order and general society.
- **Renke Commission (2005):** The commission had estimated their population to be around **10 to 12 crores** at the time.

What is SEED?

- **About:** The **Scheme for Economic Empowerment Denotified, Nomadic, Semi Nomadic** communities was launched in **February 2022** by the Ministry of Social Justice & Empowerment.
- **Aim and Components:** It aims to provide **free competitive exam coaching to these students for Civil Services**, entry to professional courses like medicine, engineering, **MBA, etc.**
 - To provide health insurance to families, to uplift clusters of these communities through livelihood initiatives, and to provide financial assistance for housing.
 - Health Insurance through **PM Jan Arogya Yojana**.
 - Livelihoods through **National and State Rural Livelihood Missions** (NRLM and SRLMs).
 - Land and Housing construction of houses through **PM Awas Yojana**.
- **Features:** It ensures expenditure of **Rs.200 crore** to be spent over five years beginning 2021-22.
 - The **DWBDNCs** has been tasked with the implementation of this scheme.

What are India's Efforts Taken for DNTs, NTs, and SNTs?

- **Dr Ambedkar Pre-Matric and Post-Matric Scholarship for DNTs:** This **Centrally Sponsored Scheme** was launched in **2014-15** for the welfare of those DNT students who are not covered under **SC, ST or OBC**.
 - The scheme of **Pre-matric Scholarships** for DNT students is helpful in spreading education amongst DNT children, especially the girl child.

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Note:

- **Nanaji Deshmukh Scheme of Construction of Hostels for DNT Boys and Girls:** This Centrally Sponsored Scheme, launched in 2014-15, is implemented through State Governments/UT Administrations/Central Universities.
 - The goal of the program is to offer hostel accommodations to DNT students who do not fall under the categories of SC, ST, or OBC.

Burqa Ban in Switzerland

Why in News?

Switzerland's prohibition on face-covering garments, including **burqas** and **niqabs**, has come into effect from 1st January 2025.

- This measure, approved through a nationwide referendum in March 2021, reflects the ongoing **global debate over wearing hijabs and burqas**, an issue that has also sparked significant discourse in India.

Note: In addition to Switzerland, countries such as France, Belgium, Germany, Australia, Austria, and Canada have also imposed bans on various types of face veils, including hijabs and burqas.

Karnataka Government on Hijab Ban

- In 2022, the **Karnataka government passed an order** prohibiting the wearing of hijab (headscarf) in government educational institutions.
- The order cited **Section 133(2) of the Karnataka Education Act, 1983**, which grants the **state powers to issue directives** for government schools to follow.
- In 2013, the state used this **provision to make uniforms compulsory**. The latest order states that the **hijab is not an essential religious practice for Muslims** that can be protected under the Constitution.

Iranian Hijab Movement

- **Historical Background:** Post-1979 Iranian Revolution, the **hijab was made mandatory for women**, sparking decades of resistance.

- **Protests and Symbolism:** Iconic acts like the “**Girl of Enghelab Street**” protest, where a woman waved her white headscarf on a stick, **symbolize defiance against the dress code**.
 - Protests reignited after the **death of Mahsa Amini**, allegedly due to strict hijab enforcement, leading to widespread demonstrations.
- **Government Crackdown:** Iran enforces the hijab mandate with fines and imprisonment for non-compliance, intensifying societal tensions.
- Currently the movement is supported by **both men and women who oppose the compulsory dress code**, reflecting broader demands for personal freedoms and women's rights.

What is the Status of Hijab Wearing in India?

- **Amna Bint Basheer v CBSE, 2016:** In **Amna Bint Basheer v CBSE, 2016**, the Kerala HC ruled that **wearing a hijab is an essential religious practice** but **upheld the CBSE dress code**, allowing additional measures and safeguards as in 2015.
 - The **Central Board of School Education (CBSE)** argued that the dress code was to prevent unfair practices.
- **Kerala High Court, 2018:** In **Fathima Thasneem v State of Kerala, 2019**, the case involved two girls who wanted to wear the **headscarf and the Christian missionary school** refused to allow the headscarf.
 - The court ruled in favour of the school's decision, stating that the “**collective rights**” of the school must take **precedence over individual student rights**.
- **Resham v. State of Karnataka, 2022:** Karnataka HC in March 2022, validated the state government's ban on hijabs in government colleges.
 - HC upheld the ban stating that **wearing a hijab did not qualify as an essential religious practice** and the ban **did not violate the Freedom of Speech and Expression**.
- **Split Verdict by Supreme Court (SC), 2022:** In **Resham v. State of Karnataka, 2022** case 2-judge bench of SC delivered a split verdict. The case has now been referred to a **larger bench of the SC**.

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Note:

Divergent views

A look at what was emphasised by the two verdicts on the hijab ban

DELIVERED BY
JUSTICE HEMANT GUPTA

"Secularism is applicable to all citizens, therefore, permitting one ... community to wear their religious symbols would be antithesis to secularism."

SCHOOL AND RELIGION: Religion has no meaning in a secular school run by the state. "Students are free to profess their religion and carry out religious activities other than when they're attending a classroom."

UNIFORM, EQUALITY: "... Uniform fosters a sense of 'equality' amongst students- instills a sense of oneness, diminishes individual differences..."

DELIVERED BY
JUSTICE SUDHANSHU DHULIA

"Wearing hijab should be simply a matter of choice. It may or may not be a matter of essential religious practice, but it still is, a matter of conscience, belief, expression."

CLASSROOM IS DIFFERENT: Though discipline is required in educational institutions, they can't be put on par with a jail or a military camp, as was cited by HC while describing schools as "qualified public spaces"

TICKET TO EDUCATION: "If it is worn as a matter of her choice, as it may be the only way her conservative family will permit her to go to school... her hijab is her ticket to education"

Constitutional Framework for Religious Freedom in India

- The Indian Constitution guarantees the **Right to Freedom of Religion** under **Articles 25-28**, enshrined in **Part III (Fundamental Rights)**:
 - **Article 25(1):** Ensures the "freedom of conscience and the right to freely profess, practice, and propagate religion," providing a negative liberty where the state cannot interfere with religious practices.
 - **Article 26:** Grants the "freedom to manage religious affairs," allowing religious denominations to establish and manage institutions for religious and charitable purposes, subject to public order, morality, and health.
 - **Article 27:** Prohibits the state from **compelling citizens to pay taxes** for promoting or maintaining any particular religion, reinforcing the principle of secularism.
 - **Article 28:** Regulates **religious instruction in educational institutions**, restricting religious instruction in state-funded or state-recognized institutions, except where explicitly permitted.
- Additionally, **Articles 29 and 30** safeguard the **cultural and educational rights of minorities**, emphasizing the protection of their unique identities.

What are the Arguments in Favour and Against Such Ban?

- **Arguments in Favour of Ban:**
 - **Uniformity and Discipline:** Enforcing a dress code **promotes uniformity** and fosters **discipline** in educational institutions.

- It prevents the display of overt religious symbols, maintaining a **neutral and inclusive space** free from religious divisions.

- **Gender Equality:** Hijab and similar practices are often viewed as **tools of patriarchy that perpetuate gender inequality** and restrict women's freedom.
- **Integration into Society:** Prohibiting such practices can **encourage integration into the broader society**, avoiding potential alienation caused by visible religious markers.
- **Not Absolute Fundamental Right:** Fundamental rights are not absolute and are **subject to reasonable restrictions**.

- The right to religion under Article 25 cannot override other fundamental rights, particularly in **government-funded educational institutions**.

- **Security Concerns:** Such bans also aim to **prevent anonymity that may hinder identification**, deter **misuse of garments to conceal weapons**, and **enhance public safety** in high-risk areas.

- For example: **2019 Easter bombings in Sri Lanka**, the suicide bombers blended in with the public.

➤ Arguments Against Ban:

- **Freedom of Religion:** Article 25 of the Indian Constitution guarantees the **right to practice and profess religion**, banning such practices may create a sense of alienation and exacerbate social tensions.
- **Autonomy and Choice:** Imposing a ban **infringes on personal liberty** and the right of individuals, particularly women, to make choices about their attire.

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Note:

- **Impact on Education:** Restricting hijab may discourage female students from conservative backgrounds from attending schools, adversely affecting their education and empowerment.
- For example: In 2019–20, Muslim girls had lower school attendance rates than Hindu girls in most states.
 - For instance, in **Uttar Pradesh**, while only **63.2% of Muslim girls attended school**, **81% of Hindus did so**.
- Such bans can also hinder educational access, disproportionately affecting girls from conservative backgrounds and further marginalizing these groups.

Eradicating Manual Scavenging

Why in News?

The **National Human Rights Commission (NHRC)** organised an open house discussion on 'Dignity and Liberty of the Individuals- Rights of **Manual Scavengers**'.

Manual Scavenging

- **About:** Manual scavenging refers to the practice of **physically handling or cleaning human excreta** by individuals.
 - It involves manual cleaning of human excreta from **insanitary toilets, open drains, pits, or railway tracks**.
- **Current Status:** In 2021, India recorded **58,098 manual scavengers**, with **women comprising 75%** of them.
 - As on **31st July, 2024**, out of **766 districts** in the country, **732 districts** have reported themselves as **manual scavenging-free**.
- **Violation of Fundamental Rights:** Manual scavenging violates fundamental rights, especially **article 17** (abolition of untouchability) and **article 21** (Right to life with dignity).

- **Legal Framework Related to Manual Scavenging:**
 - **Prohibition of Employment as Manual Scavengers and Their Rehabilitation Act, 2013:** **Prohibition of Employment as Manual Scavengers and Their Rehabilitation Act, 2013** prohibits manual scavenging, including the construction of insanitary latrines, and mandates the demolition or conversion of such latrines into sanitary ones.
 - It also provides for the identification and rehabilitation of manual scavengers through **skill development, financial assistance, and alternative employment**.
 - **SC/ST (Prevention of Atrocities) Act, 1989:** It criminalises the employment of scheduled castes in manual scavenging.

What are the Major Challenges Faced by Manual Scavengers?

- **Health:** Manual scavengers are frequently exposed to human waste, which contains numerous **pathogens**.
 - This exposure makes them highly susceptible to diseases such as **Hepatitis, tetanus, and cholera**.
 - The presence of poisonous gases like **hydrogen sulphide** in septic tanks poses a serious risk of **asphyxiation**, which can lead to sudden death.
 - According to the government data, **377 persons** have died from **2019 to 2023** due to **hazardous cleaning of sewers and septic tanks**.
- **Social Stigma:** Manual scavengers are stigmatized and treated as **untouchables**, reinforcing social exclusion and **perpetuating the caste system**.
- **Economic Challenges:** Manual scavengers are paid meager amounts, often below the **minimum wage**, keeping them trapped in a **cycle of poverty**.
 - They are employed on a **contractual or daily-wage basis**, without job security or benefits.
- **Double Discrimination:** Women, who form a significant portion of **manual scavengers**, face double discrimination in the **form of gender and inequality** such as sexual harassment and exploitation, alongside societal stigma.
- **Psychological Issues:** The social stigma attached to the profession often causes significant **mental health challenges**, such as anxiety and depression.

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Note:

- **Drug Use:** To cope with the **stress and stigma** of their precarious work, many manual scavengers resort to **drug use**, which further exacerbates their health problems.

NATIONAL HUMAN Rights COMMISSION (NHRC)

According to NHRC, Human Rights are the rights relating to life, liberty, equality and dignity of the individual guaranteed by the Constitution or embodied in the International Covenants and enforceable by courts in India

- Watchdog of Human Rights in India
- **Estd:** 1993 (in conformity with Universal Declaration of Human Rights)
- **Act:** Protection of Human Rights Act (PHRA), 1993

State Human Rights Commissions

- Also constituted under the PHR Act, 1993
- **Appointment of Members:** by Governor
- **Removal of Members:** by President

Human Rights Day: 10 December

Functions

- ⌚ Investigates Complaints of human rights violations
- ⌚ *Suo Moto* cognizance of cases
- ⌚ Reviews and recommends human rights implementation
- ⌚ Spreading human rights awareness
- ⌚ Conduct studies, publish reports on human rights issues

Powers

- ⌚ Summon individuals, examine witnesses, and receive evidences
- ⌚ Inspect prisons and other institutions to ensure conditions are humane
- ⌚ Intervene in court proceedings relating to human rights

Members of NHRC

Composition

- ⌚ 5 full-time members and 7 deemed members
- ⌚ **Chairperson:** Retired CJI/Judges of the SC
- ⌚ **Administrative Head:** Secretary-General

Appointment

- ⌚ All members appointed by **President** on recommendations of a **6-member** committee (PM, Speaker of LS, Deputy Chairman of RS, Union Home Minister and Leaders of Opposition of both Houses of Parliament)

Global Alliance of National Human Rights Institutions (GANHRI) Status

- NHRC has been accredited '**A**' Status since 1999
- Retained '**A**' Status: 2006, 2011 and 2017
- Suspension of '**A**' Status: 2023 and 2024

Tenure

- ⌚ 3 years / till age 70 (whichever is earlier)

Removal

- ⌚ President can remove the chairman or any member
- ⌚ **Ground:** Charges of proved misbehaviour or incapacity



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Note:

What is the Supreme Court Guideline on Manual Scavenging?

- **Dr. Balram Singh Case, 2023:** The SC issued **14 directions to the Union, State and UTs** to completely eradicate manual scavenging ranging from forming guidelines and policies, rehabilitation, compensation, etc. Some of them are:
 - **Eradication of Manual Sewer Cleaning:** Phased measures to eliminate manual sewer cleaning.
 - **Rehabilitation of Sewage Workers:** Compensation (Rs 30 lakhs for death, Rs 10-20 lakhs for disabilities), employment for next of kin, and education for dependents.
 - **Accountability for Outsourced Work:** Accountability mechanisms, including contract cancellations and penalties.
 - **NALSA Involvement in Compensation:** **NALSA** to manage compensation disbursement and models.
 - **Monitoring and Transparency:** A portal to track deaths, compensation, and rehabilitation

What are India's Initiatives to Curb Manual Scavenging?

- **Safaimitra Suraksha Challenge**
- **Swachhta Abhiyan App**
- **Rashtriya Garima Abhiyan**
- **National Commission for Safai Karamchari**
- **Swachhta Udyami Yojana (SUY)**
- **Recognition of Prior Learning (RPL)**
- **NAMASTE (National Action for Mechanised Sanitation Ecosystem)**
- **Emergency Response Sanitation Units (ERSUs):** To develop a professional, well-trained, and adequately equipped workforce.
- **Technological Initiatives:**
 - **Bandicoot Robot:** Autonomously or remotely cleans, inspects, and removes blockages in sewer lines.
 - **Endobot & Swasth AI:** Diagnose pipelines to detect and mitigate water contamination, wastage, and sewer overflows.
 - **Robo-Drain System:** Automated robotic technology for cleaning underground sewers.

- **Vacuum Trucks:** Use powerful pumps to remove sewage waste without human entry.

Global Nutrition Targets

Why in News?

A recent **Lancet** study evaluating **global progress on Global Nutrition Targets (GNTs)** from 2012 to 2021 showed **slow progress** in tackling maternal and **child malnutrition**, undernutrition, and **overweight**.

- The findings raise concerns about policy design and the need for innovative strategies to address these ongoing issues.

What are Global Nutrition Targets (GNTs)?

- **World Health Assembly Resolution, 2012:** Endorsed a Comprehensive Implementation Plan on **maternal, infant, and young child nutrition**, setting six global nutrition targets for 2025.
- **Global Nutrition Targets:**
 - Achieve a **40% reduction** in the number of children **under-5** who are stunted.
 - Achieve a **50% reduction** in **anaemia** in women of reproductive age.
 - Achieve a **30% reduction** in low birth weight.
 - Ensure that there is **no increase** in **childhood overweight**.
 - Increase the **rate of exclusive breastfeeding** in the first 6 months to at least 50%.
 - Reduce and maintain **childhood wasting** to less than 5%.

Key Terms

- **Malnutrition:** It is an **imbalance between the nutrients the body needs and the nutrients it receives**.
 - It encompasses both **undernutrition** (including **stunting** (low height for age), **wasting** (low weight for height), and **underweight** (low weight for age)) and **overnutrition** (overweight and **obesity**), posing a **dual burden on public health**.
- **Anaemia:** Anaemia is a condition of low red blood cells or **haemoglobin**, reducing oxygen supply to tissues, mainly affecting women and children.

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Note:

What are the Key Findings of the Study?

- **Slow and Insufficient Progress:** Across 204 countries, there has been slow and insufficient progress in meeting the **GNTs from 2012 to 2021**, with projections up to 2050 showing limited success.
 - Few countries are expected to meet the targets for **stunting** in children under 5.
 - None of the countries are projected to meet the targets for **low birth weight, anaemia, and childhood overweight** by 2030.
- **Anaemia and India:** Anaemia in India has **remained static for two decades**.
 - **Iron deficiency** is assumed to be the cause **but accounts for only one-third of anaemia cases**, unknown causes contribute to the other significant third.
 - Anaemia prevalence increased during the **Covid-19 lockdown** when school meals (**Midday Meal Scheme**) stopped, highlighting the need for a broader nutrition approach.
 - The study found discrepancies in **anaemia measurements**, in India, **venous blood-based** (blood is drawn from a vein) **anaemia prevalence** (as recommended by **WHO**) was half that of **capillary blood-based** (blood is taken from a fingertip) **prevalence** in national surveys.
- **Stunting:** Stunting often develops within the **first two years of life**, increasing from 7–8% at birth to 40% by age two in India.
 - Overfeeding children after age **2 years may lead to being overweight rather than correcting stunting**.
 - Poor children in India consume only **7 grams of fat per day**, against the required 30–40 grams.
- **Childhood Overweight:** Overweight among children is increasing globally, including in India, contributing to **“metabolic overnutrition,”** which could lead to **chronic health problems** such as non-communicable diseases.
 - A significant portion of **Indian children (50%)** face **metabolic overnutrition**, which contributes to non-communicable diseases.
- **Recommendations:** **Diversify diets to address anaemia**, as it's not solely caused by iron deficiency.

- Focus on **prevention of stunting** in the first two years of life.
- Improve **energy intake, particularly fat intake**, for children under 3.
- Adopt **more accurate and context-specific methods** for measuring anaemia and stunting.
 - Address both **undernutrition and overnutrition** in policy to prevent **non-communicable diseases**.

What are the Challenges for Achieving GNTs?

- **Global:**
 - **Persistent Anemia:** The global prevalence of anemia among women of reproductive age **has remained largely unchanged**.
 - Anaemia burdens **low-income countries, especially rural, poor, and uneducated populations**, due to **insufficient awareness and targeted policies**.
 - **Slow Progress on Stunting:** Despite efforts, the number of stunted children is projected to reach **127 million by 2025**, missing the target of 100 million, due to a **lack of early policies targeting the initial days of a child's life**.
 - **Rising Overweight and Obesity:** The rising prevalence of overweight and obesity, affecting **37 million children under 5 and over 390 million children and adolescents aged 5–19 in 2022**, is driven by factors such as urbanization, changing dietary patterns, and reduced physical activity.
 - **Childhood Wasting:** Childhood wasting affects an estimated 45 million children under 5 globally.
 - Childhood wasting prevention faces challenges like **food insecurity, limited healthcare, and poor sanitation**, especially in South Asia.
- **India:**
 - **Limited Dietary Diversity:** Diets in India are often dominated by **rice, wheat, and cereals**, with insufficient intake of **fruits, vegetables, dairy, and proteins**, leading to poor nutrition.
 - The lack of dietary diversity, especially among **lower-income households**, limits access to essential micronutrients.

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Note:

- The **National Family Health Survey (NFHS)-5** found that only **11.3% of children aged 6 months to 2 years** receive a 'minimum acceptable diet' as per WHO standards, highlighting significant gaps in both food quality and feeding frequency.
- **Economic Barriers:** A significant portion of the population **struggles to afford a nutritious diet** due to low incomes and **high food prices**, contributing to **malnutrition**.
- **Inadequate Data:** The absence of **comprehensive national surveys** on dietary diversity hampers targeted nutrition interventions.
 - While the **NFHS** provides some insights, it lacks detailed data on the quantities of food consumed, limiting its utility in addressing nutrition gaps.
- **Non-Communicable Diseases (NCDs):** The rising diet-related **NCDs like obesity, diabetes, and hypertension** is increasing the burden on public health systems, requiring more focus on addressing both **under- and over-nutrition**.
- **Food Systems Constraints:** **Climate change and extreme weather events** further threaten food security, impacting crop yields and the availability of diverse foods.

India's Initiatives Related to Nutrition

- **Mission Poshan 2.0**
- **Integrated Child Development Services (ICDS) Scheme**
- **Pradhan Mantri Matru Vandana Yojana (PMMVY)**
- **Mid-Day Meal Scheme**
- **Scheme for Adolescent Girls (SAG)**
- **Mother's Absolute Affection (MAA)**
- **Poshan Vatikas**

Transgender Rights and Related Concerns

Why in News?

In *Ms. X vs State of Karnataka Case, 2024*, the Karnataka **High Court (HC)** held transgender people can change their name and gender on birth certificates.

- Changing the name and gender on birth certificates of transgenders is **explicitly permitted** under the **Transgender Persons (Protection of Rights) Act, 2019** and **Transgender Persons (Protection of Rights) Rules, 2020**.

What are the Key Facts of the Ms. X vs State of Karnataka Case, 2024?

- **Background:** The petitioner was diagnosed with **gender dysphoria** and she underwent **sex-reassignment surgery** and legally changed her name and gender identity on her **Aadhaar card, driving license, and passport**.
 - However, her request to **change** the gender and name on her **birth certificate** was **rejected**.
 - Gender dysphoria refers to **psychological distress** that occurs when a person's sex assigned at birth does not match his gender identity.
- **Legal Objection:** Section 15 of the **Registration of Births and Deaths Act, 1969** permits **changes to birth certificates** only if the information is **erroneous** or was entered **fraudulently or incorrectly**.
 - **Registration of Births and Deaths Act, 1969** governs the granting of **birth and death certificates**.
- **Violation of Fundamental Rights:** The petitioner argued that the restrictive nature of **Section 15** of Registration of Births and Deaths Act, 1969 violated her **right to life with dignity** under **Article 21** of the Indian Constitution.
 - She also claimed that documents showing different identities create a **dual identity**, leading to potential **harassment and discrimination**.
- **Transgender Persons (Protection of Rights) Act, 2019:** It states that transgender people can be issued a "**certificate of identity**" as proof of their identity (**Section 6**) which can be revised if they choose to opt for a **sex-reassignment surgery (Section 7)**.
 - The law **explicitly** says the gender of a transgender person "**shall be recorded in all official documents**" per this certificate.
- **Karnataka HC Ruling:** It held that the 1969 Act is a "**general enactment**" and must **comply** with the Transgender Persons (Protection of Rights) Act, 2019 which is a "**special enactment**".

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Note:

- It invoked the legal principle of “*generalia specialibus non-derogant*”, which roughly translates to “the special shall prevail over the general”.
- The court ruled that the **Registrar** must accept the **transgender certificate** and issue a **corrected birth certificate** until the 1969 Act is amended.
- General enactments apply broadly, like the 1969 Act, while **special laws** focus on **specific issues**, such as the Transgender Persons Act.
- **Significance:** This judgment emphasizes the **supremacy of laws specifically designed to protect the rights of transgender individuals** over general laws.
 - It paves the way for the **recognition of gender identity in all official records** for transgender persons.

Note: In India, the total population of transgender is around **4.88 Lakh** as per **2011 census**.

- The top 3 states with the largest transgender population are **Uttar Pradesh, Andhra Pradesh, and Maharashtra**.

Timeline of Reforms for Transgender Persons

- **Election Commission's Directive (2009):** Registration forms were updated to include an “others” option, allowing transsexual individuals to avoid male or female identification.
- **Supreme Court Ruling (2014):** In ***National Legal Services Authority vs. Union of India case, 2014***, the Supreme Court recognized transgender people as the “**Third Gender**,” emphasizing it as a human rights issue.
- **Legislative Efforts:** ***Transgender Persons (Protection of Rights) Act, 2019*** was enacted to protect transgender rights.

What are Key Facts About Transgender Persons Act, 2019?

- **Define Transgender:** Transgender person means someone whose **gender does not match with the gender assigned to that person at birth**.
 - It clarifies terms like ‘**person with intersex variation**’ and ‘**transgender person**’ to include **trans men and women**, regardless of surgery or therapy.

- **Non-discrimination:** Prohibits discrimination in **education, employment, healthcare, and public facilities**, and affirms rights to movement, property, and office.
- **Certificate of identity:** Grants the right to **self-perceived gender identity** and requires district magistrates to issue certificates **without medical exams**.
- **Medical care:** Ensures **HIV surveillance**, access to medical care, sex reassignment surgeries, and therapy with insurance coverage.
- **National Council for Transgender Persons:** Established to advise the government and address grievances.
- **Offences and penalties:** Punishes offences like **forced labor, abuse, and denial of rights** with imprisonment (6 months to 2 years) and fines.

What are the Issues Faced by Transgender in India?

- **Social Marginalization:** Transgender individuals **face exclusion from society**, leading to limited opportunities for social participation, **low self-esteem, and isolation**.
 - **Public spaces**, like restrooms and shelters, often **fail to accommodate** transgender people, exposing them to **harassment, assault, and marginalization**.
- **Discrimination in Education:** Transgender individuals face **bullying and exclusion** in education, resulting in **higher dropout rates** and a literacy rate of **46%**, compared to the national average of **74%**.
- **Homelessness:** Rejection by families and **lack of housing options** force many transgender youth to **live on the streets, facing abuse, mental health issues, and drug use**.
- **Transphobia:** Transgender individuals are often subjected to violence, harassment, and discrimination due to **societal intolerance and transphobia**.
 - **Transphobia** refers to **negative attitudes, fear, hatred, or prejudice** against transgender people.
- **Psychological Distress:** Transgender individuals experience significant psychological distress, including **anxiety, depression, and suicidal thoughts**, due to lack of support systems.

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Note:

- **Public Representation:** Negative portrayals of transgender people in the media and public spaces perpetuate stereotypes and fuel societal rejection and violence.

Managing Hazardous Waste

Why in News?

Four decades after the **Bhopal gas tragedy (1984)**, **hazardous waste** (toxic waste) from the abandoned **Union Carbide India Ltd (UCIL)** factory in Madhya Pradesh was finally removed for **incineration**.

What was the Bhopal Gas Tragedy?

- **About:** On the night of **2nd December 1984**, a catastrophic **chemical leak** occurred at the **UCIL pesticide plant in Bhopal**.
 - The leak involved **methyl isocyanate (MIC) gas** that **killed over 5000 people and poisoned** more than **half a million** others in the city of Bhopal, making it the world's worst industrial disaster.
 - Reports of chemical leaks, including **phosgene** and **methyl isocyanate**, were documented in the years prior to 1984.
- **Cause of the Leak:** A failed maintenance attempt on 1st December 1984, coupled with **malfunctioning safety systems**, triggered a **chemical reaction** in a MIC filled tank leading to release of at least **30 tonnes of MIC gas** into the atmosphere by **midnight on 2nd December 1984**.
- **Health Effects:**
 - **Immediate:** Respiratory problems, **abdominal pain, eye issues**, and neurological impairments were common among the exposed individuals.
 - **Long-Term:** Chronic health issues such as **decreased lung function, genetic abnormalities, pregnancy loss**, and infant mortality rates increased dramatically in affected populations.
- **Government and Legal Response:** The Indian government passed the **Bhopal Gas Leak Disaster. (Processing of Claims) Act, 1985** to act as the **legal representative** for the victims.
 - UCIL initially offered **USD 5 million in relief**, but the Indian government demanded **USD 3.3 billion**.

The case was eventually settled out of court in 1989 for **USD 470 million**.

- In **2010**, seven Indian nationals employed by UCIL were **convicted for causing death by negligence** but were released on bail.
- **Aftermath and Legacy:** Despite the passage of time, survivors still lack health care and **face lingering toxic materials** at the factory site.
 - Welfare organizations demand the **removal of hazardous waste** from the closed factory site.

Methyl Isocyanate (MIC)

- **About:** Methyl Isocyanate is a **colourless liquid** used for making **pesticides**.
- **Reactivity:** The chemical is **highly reactive to heat**.
 - When exposed to **water**, the compounds in MIC react with each other causing a **heat reaction**.
- **Storage:** It is **no longer in production**, although it is still used in pesticides.
 - The **Bayer CropScience plant in Institute, West Virginia, US** is currently the **only storage location** of MIC left across the globe.

What is Hazardous Waste?

- **About:** Hazardous waste refers to waste that poses a **danger to health or the environment** due to characteristics like **toxicity, flammability, reactivity, or corrosiveness**, either alone or when combined with other substances.
- **Sources:**
 - **Use of Hazardous Substances:** Most hazardous waste is produced during **chemical production and consumption**, increasing with rising demand for consumer goods.
 - **Inappropriate Technologies:** Outdated technologies used by **small and medium enterprises (SMEs)** result in inefficient resource conversion, leading to higher and more toxic hazardous waste.
 - **Post-Treatment:** **Wastewater treatment** and **gaseous emissions** result in residues containing hazardous substances.
- **Hazardous Waste Regulations:**
 - **Environment Protection Act, 1986:** The **Hazardous Waste (Management and Handling) Rules, 1989**

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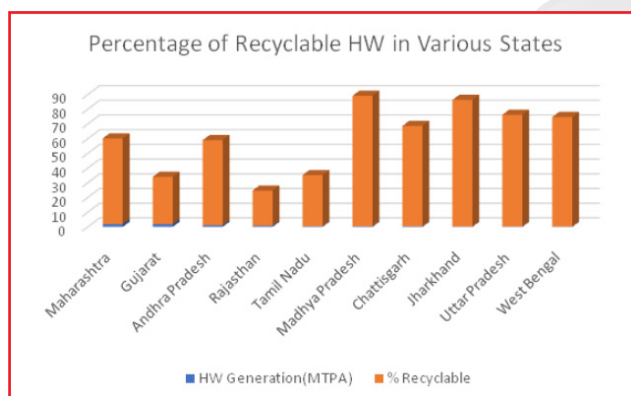
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Note:

were introduced under the **Environment Protection Act, 1986**.

- These rules were amended in **2008, 2009, 2010, and 2016** to include other waste types (e.g., used electronics, paper waste, metal scrap, and waste tires).
- **Basel Convention, 1992:** India is a signatory to the **Basel Convention, 1992**, which aims to reduce the movement of hazardous waste across countries.
- **Waste Generation:** India generates about **7.66 million tonnes per year** of hazardous waste from **industries**.
- The breakdown of hazardous waste shows that **44.3% is landfillable, 47.2% is recyclable, and 8.5% is incinerable**.
- **83% of hazardous waste** is generated in seven states i.e., **Gujarat, Maharashtra, Tamil Nadu, Andhra Pradesh, West Bengal, and Chhattisgarh**.



- **Hazardous Waste Production:** As per the **Compendium of Environmental Statistics India, 2016**, most of the hazardous waste is being generated from **chemical production & metal processing industries** apart from the treatment of **wastewater and flue gases**.

How Hazardous Waste is Disposed?

- **Co-processing:** It involves using waste materials, like **industrial by-products or hazardous waste**, as alternative **raw materials or fuels** in industries, especially **cement manufacturing** or other high-temperature industries.
 - About **25 cement plants** have started co-processing in India.
- **Material and Energy Recovery:** Material recovery makes use of the material value **embedded in the**

waste whereas energy recovery utilizes its **calorific value**.

- E.g., recovering **copper from cable residues** and re-melting of the copper or recovery of **lead from used batteries**.
- **Spent lube oil, solvents, solid and semi-solid grease, and wax** can be used as an alternative fuel for industrial processes that require **thermal energy input**.
- **Incineration:** Incineration is the process of **burning waste in big furnaces at high temperatures**. It converts waste materials into **bottom ash, flue gasses, particles, and heat** that can be utilized to produce electricity.
- **Pyrolysis:** **Pyrolysis** involves the **thermal decomposition of waste materials in the absence of oxygen** or with limited oxygen usually at temperatures ranging from **300°C to 900°C**.
 - It converts waste materials into useful products such as **bio-oil, synthesis gas (syngas) and char**.



Note:

- **Bio-oil** is a **liquid fuel** produced through the **pyrolysis** of organic materials such as **biomass (wood, agricultural residues, algae)**, and other plant matter.
- Syngas is a fuel gas mainly composed of **hydrogen (H₂), carbon monoxide (CO)**, and small amounts of **carbon dioxide (CO₂) and methane (CH₄)**.
- **Char** is a solid, **carbon-rich byproduct** generated during the **thermal decomposition of organic materials** in processes such as **pyrolysis**.

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Note:

World Malaria Report 2024

Why in News?

The [World Health Organization \(WHO\)](#) highlighted India's remarkable progress in its [World Malaria Report 2024](#). India significantly **reduced malaria cases and related deaths** between 2017 and 2023, marking a major milestone.

- India aims to achieve **malaria-free status by 2030**, with zero indigenous cases by 2027.

Malaria

- Malaria is a life-threatening **vector-borne disease** caused by the *Plasmodium parasites*, transmitted through the bites of infected **female Anopheles mosquitoes**.
 - There are 5 *Plasmodium parasite* species that cause malaria in humans and 2 of these species – *P. falciparum* and *P. vivax* – pose the greatest threat.
- Malaria is predominantly found in the tropical and subtropical areas of Africa, South America as well as Asia.
 - The **mosquito becomes infected after biting an infected person**. The malaria parasites then enter the bloodstream of the next person the mosquito bites. The parasites travel to the liver, mature, and then infect **red blood cells**.
- Symptoms of malaria include fever and flu-like illness, including shaking chills, headache, muscle aches, and tiredness. Notably, **malaria is both preventable and curable**.

What are the Findings of the Report?

- **Global Findings:**
 - **Disease Burden:**
 - An estimated **263 million malaria cases occurred globally in 2023**, an increase of 11 million cases from 2022.
 - Malaria mortality stood at 597,000 deaths globally, showing a decline compared to 622,000 deaths in 2020.
 - **Geographic Distribution:**
 - The **WHO African Region** carried **94% of global malaria cases** and **95% of malaria deaths in 2023**.

- **Five countries**—Nigeria (26%), Democratic Republic of Congo (13%), Uganda (5%), Ethiopia (4%), and Mozambique (4%)—accounted for nearly 52% of global malaria cases.

- **Since 2015, nine countries**, including Egypt in 2024, have been **certified malaria-free**.

Intervention Uptake:

- The rollout of two malaria vaccines, **RTS,S and R21**, has significantly increased vaccine coverage in endemic areas.

India Specific Findings:

- **Historical Transformation:** At independence, India faced **7.5 crore malaria cases annually with 800,000 deaths**, posing a critical public health challenge.
 - Persistent efforts have cut cases by over 97%, reducing them to 2 million annually, while deaths have plummeted to just 83 by 2023.
- **Latest Achievements (2017-2024):** From 2015 to 2023, Malaria cases fell from 11,69,261 to 2,27,564, and deaths dropped from 384 to 83, representing an **80% reduction**.
 - The **Annual Blood Examination Rate** increased from 9.58 (2015) to 11.62 (2023), ensuring early detection and intervention.
 - In 2024, India exited **WHO's High Burden to High Impact (HBHI) group**, marking a key milestone.
 - HBHI is a country-led approach on global malaria response.
- **Reduction in Disease Burden:**
 - States in **high-burden** decreased from 10 to 2 (Mizoram & Tripura).
 - Odisha, Chhattisgarh, Jharkhand, and Meghalaya transitioned to **medium-burden**.
 - Andaman & Nicobar Islands, Madhya Pradesh, Arunachal Pradesh, and Dadra and Nagar Haveli moved to **low-burden**.
 - Ladakh, Lakshadweep, and Puducherry achieved **Zero status**, eligible for subnational malaria elimination verification.

What are the Government Initiatives to Curb Malaria?

- **National Framework for Malaria Elimination 2016-2030**
- **National Vector-Borne Disease Control Programme:** Addresses various **vector-borne diseases**, including malaria, through prevention and control measures.

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Note:

- **National Malaria Control Programme (NMCP):** Launched in 1953, to address the severe impact of malaria.
 - It focuses on three core activities: **insecticidal residual spraying (IRS) with DDT**, **case monitoring and surveillance**, and **patient treatment**.
- **High Burden to High Impact (HBHI) Initiative:** Initiated in four states (West Bengal, Jharkhand, Chhattisgarh, and Madhya Pradesh) in 2019.
 - It focuses on **malaria reduction through insecticidal net distribution**.
- **Malaria Elimination Research Alliance-India (MERA-India):** Established by the **Indian Council of Medical Research (ICMR)**, collaborates with partners on malaria control research.

Global Polio Resurgence

Why in News?

Recently, the **World Health Organization (WHO)** has identified the presence of **poliovirus** in multiple countries, including **Pakistan, Cameroon, and several European nations**.

- The research suggests that **poliovirus may be primarily transmitted via the respiratory route** rather than the traditionally assumed faecal-oral route.

What is polio

- **Poliomyelitis (polio)** is a highly infectious viral disease, mainly affecting children
- According to WHO, the virus is transmitted from person-to-person, mainly through the faecal-oral route

STRAINS

- There are three types of polio virus strains — P1, P2 and P3
- P2 was eradicated globally in 1999
- India attained a polio free status in 2014 after successfully eliminating the wild P1 and P3 strains



VACCINATION SCHEDULE

- OPV:** At 6 weeks, 10 weeks and 14 weeks
- IPV:** At 6 weeks and 14 weeks
- OPV booster:** Between 16 and 24 months

What are the Key Factors Contributing to Polio Resurgence?

- **Detection of Poliovirus:** The resurgence of polio is evidenced by recent detections of both **wild and vaccine-derived poliovirus** in various countries.
 - In 2024, Pakistan reported a total of 62 cases of wild poliovirus type 1 (WPV1).
 - Environmental samples containing poliovirus have also been found in cities such as **Barcelona, Warsaw, and Cologne (Germany)**, indicating potential **undetected or unvaccinated populations** at risk.
- **Immunisation Gaps:** In fragile and conflict-affected areas, **routine immunization coverage has dropped** significantly, making children more vulnerable to polio outbreaks.
 - **Eg:** In Sudan's active conflict zones, vaccination coverage has dropped sharply from 85% to just 30%.
- **Shift in Vaccine Strategy:** The **Oral Polio Vaccine (OPV)** has been linked to outbreaks of **vaccine-derived poliovirus cases (cVDPV)**, which complicates eradication efforts.
 - Recent research emphasizes the **need for a transition to IPV**, which is **non-transmissible** and provides **effective protection against paralysis** caused by poliovirus.

Difference Between Inactivated Polio Vaccine (IPV) and Oral Polio Vaccine (OPV)

- **Inactivated Polio Vaccine (IPV)**
 - **Advantages:**
 - **No risk of Vaccine-derived Polio:** IPV contains inactivated virus particles, which means there is no risk of the vaccine causing vaccine-induced polio.
 - **Safe for Immunocompromised Individuals:** Because IPV uses a dead virus, it is safe for people with weakened immune systems.
 - **Durable Immunity:** IPV requires multiple boosters to maintain **immunogenicity** against polio virus infection.
 - **Disadvantages:**
 - **Higher Cost:** IPV is more expensive to produce and administer compared to OPV.

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Note:

- **Requires Multiple Doses:** A complete IPV vaccination schedule typically involves a series of **2-4 shots** to provide full immunity.
- **Limited Mucosal Immunity:** IPV does not provide strong immunity in the mucous membranes (e.g., the gut), which means it may be less effective at preventing virus transmission compared to OPV.

➤ Oral Polio Vaccine (OPV)

○ Advantages:

- **Lower Cost:** OPV is cheaper to produce and distribute, making it more accessible in resource-limited settings.
- **Fewer Doses Required:** OPV typically requires only **one or a few doses** to achieve effective immunity.
- **Better Mucosal Immunity:** OPV provides strong mucosal immunity, particularly in the intestines, which helps to reduce the transmission of the poliovirus.

○ Disadvantages:

- **Risk of Vaccine-derived Polio:** OPV contains live, attenuated poliovirus, which in rare cases can revert to a form that causes outbreaks of **vaccine-derived poliovirus (VDPV)**.
- **Not Safe for Immunocompromised Individuals:** Because it contains live virus, OPV can be dangerous for people with weakened immune systems.
- **Shorter-lasting Immunity:** Immunity from OPV may not be as long-lasting as that from IPV, requiring additional doses or boosters over time.

What is Polio?

➤ About:

- **Polio (*poliomyelitis*)** is a **highly contagious viral disease** affecting mainly children **under five**, **spreading via the fecal-oral route** or contaminated food/water, potentially **causing paralysis by invading the nervous system**.
- There are three individual and immunologically distinct wild poliovirus strains:
 - Wild Poliovirus type 1 (**WPV1**), **WPV2** and **WPV3**.

➤ Types of Vaccines:

- **Inactivated polio vaccine (IPV):** It protects against poliovirus **types 1, 2, and 3**
- **Trivalent oral polio vaccine (tOPV):** It protects against poliovirus types 1, 2, and 3 - following the "OPV Switch" in April 2016, **tOPV is no longer in use**.
 - The **OPV switch** was a global effort to replace the tOPV with the bOPV in April 2016.
- **Bivalent oral polio vaccine (bOPV):** It protects against poliovirus types 1, and 3
- **Monovalent oral polio vaccines (mOPV1, mOPV2 and mOPV3):** It protects against each individual type of poliovirus, respectively.

➤ Initiatives Taken to Eradicate Polio:

- **India Specific:**
 - **Pulse Polio Programme**
 - **Intensified Mission Indradhanush 2.0**
- **Global Initiatives:**
 - **Polio Eradication and Endgame Strategic Plan 2013-2018**
 - **World Polio Day (24th October)**
 - **Global Polio Eradication Initiative (GPEI)**



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Note:

Science & Technology

Highlights

- India Joins UN Panel on Big Data
- India's Genomic Data Set
- Wildfires in California
- Sovereign AI
- 67th Foundation Day of DRDO
- 3 Years of Open Network for Digital Commerce
- Thorium-based Nuclear Energy Production
- India as Global Hub For Data Centres

India Joins UN Panel on Big Data

Why in News?

India has become a member of the **United Nations (UN) Committee of Experts on Big Data and Data Science for Official Statistics (UN-CEBD)** after its recent induction into the **United Nations Statistical Council (UNSC)**, signaling its growing influence in **global statistical frameworks**.

What is the United Nations Committee of Experts on Big Data and Data Science for Official Statistics (UN-CEBD)?

➤ About:

- **UN-CEBD** is a specialized body under the **United Nations**, established to **leverage Big Data and data science** for strengthening global statistical systems.
- It was established in 2014, under the aegis of the **United Nations Statistical Commission (UNSC)**.

➤ Members:

- It has **31 member states (including India)** and 16 international organizations.

➤ Objectives:

- **Explore the role of big data** in monitoring and reporting progress on **Sustainable Development Goals (SDGs)**.
- **Address challenges associated** with utilizing non-traditional data sources for official statistics.

➤ Governance:

- **Advisory Board:** Serves as the **principal management body** of the UN-CEBD and **convenes around 4 times a year** to review the committee's work and provide strategic guidance.
- **UN Bureau:** It oversees the **day-to-day operations and administrative functions**.

➤ Key Functions:

- **Strategic Coordination:** Provides **vision, direction, and coordination** for a global program on utilizing big data in official statistics, including for **tracking indicators** of the **2030 Agenda for Sustainable Development**.
- **Promotion of Big Data Use:** Encourages **practical applications of big data**, including cross-border data, while **addressing associated challenges and leveraging** existing frameworks.
 - Encourage **innovative utilization** of non-conventional data sources, including **satellite imagery, IoT**, and private-sector data.
- **Capacity Building:** Focuses on **enhancing capabilities through training, experience-sharing, and building technical expertise** and offering technical assistance to member nations for modernizing their statistical systems.
- **Building Public Trust:** Works towards establishing public confidence in the use of big data for official statistical purposes.

What is Big Data?

➤ About:

- **Big data** refers to **large, complex datasets** that traditional data management systems cannot efficiently store, process, or analyze.

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Note:

- It enables improved processes, better decision-making, and enhanced product/service development.
- **India's Big Data Initiatives:**
 - [National Data & Analytics Platform \(NDAP\)](#)
 - [Big Data Management Policy](#)
 - [National Data Warehouse on Official Statistics](#)
- **Drivers:** There are **6Vs** that drive big data are:

Value		Clinically relevant data Longitudinal studies
Volume		High-throughput technologies Continuous monitoring of vital signs
Velocity		High-speed processing for fast clinical decision support Increasing data generation rate by the health infrastructure
Variety		Heterogeneous and unstructured data sources Differences in frequencies and taxonomies
Veracity		Data quality is unreliable Data coming from uncontrolled environments
Variability		Seasonal health effects and disease evolution Non-deterministic models of illness and health

- **Applications:**

Big Data Application examples in different Industries:		
Retail/Consumer <ul style="list-style-type: none"> ❖ Merchandizing and market basket analysis ❖ Campaign management and customer loyalty programs ❖ Supply-chain management and analytics ❖ Event- and behavior-based targeting ❖ Market and consumer segmentations 	Finances & Frauds Services <ul style="list-style-type: none"> ❖ Compliance and regulatory reporting ❖ Risk analysis and management ❖ Fraud detection and security analytics ❖ Credit risk, scoring and analysis ❖ High speed arbitrage trading ❖ Trade surveillance ❖ Abnormal trading pattern analysis 	Web and Digital media <ul style="list-style-type: none"> ❖ Large-scale clickstream analytics ❖ Ad targeting, analysis, forecasting and optimization ❖ Abuse and click-fraud prevention ❖ Social graph analysis and profile segmentation ❖ Campaign management and loyalty programs
Health & Life Sciences <ul style="list-style-type: none"> ❖ Clinical trials data analysis ❖ Disease pattern analysis ❖ Campaign and sales program optimization ❖ Patient care quality and program analysis ❖ Medical device and pharmacy supply-chain management ❖ Drug discovery and development analysis 	Telecommunications <ul style="list-style-type: none"> ❖ Revenue assurance and price optimization ❖ Customer churn prevention ❖ Campaign management and customer loyalty ❖ Call detail record (CDR) analysis ❖ Network performance and optimization ❖ Mobile user location analysis 	Ecommerce & customer service <ul style="list-style-type: none"> ❖ Cross-channel analytics ❖ Event analytics ❖ Recommendation engines using predictive analytics ❖ Right offer at the right time ❖ Next best offer or next best action

United Nations Statistical Commission (UNSC)

- UNSC is the highest decision-making body for **international statistical activities**.
- It was established in **1946** and is a functional commission of the [UN Economic and Social Council \(ECOSOC\)](#).

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Note:

India's Genomic Data Set

Why in News?

India achieved a historic milestone at the **Genome India Data Conclave** in New Delhi with the launch of the **Indian Genomic Data (IGD) Set** under the **GenomeIndia Project (GIP)** and frameworks like the Framework for Exchange of Data Protocols (**FeED**) and the **Indian Biological Data Centre (IBDC) Portals**.

- These initiatives position India as a leader in **genomics**, providing global researchers access to **genome samples** and achieving self-reliance in genomic data.

What are the Key Highlights of the Genome India Data Conclave?

- **Indian Genomic Data Set:** A comprehensive Indian genomic data set was launched, featuring **10,000 whole genome sequencing (WGS)** samples, archived at the **Indian Biological Data Centre (IBDC)**, India's **first national repository for life science data**.
 - The dataset is now accessible to researchers worldwide, supporting advancements in genomics research and personalized medicine.
 - The IBDC Portal facilitates seamless access to genetic data.
- **FeED Protocols:** The FeED ensures **ethical, transparent, and secure sharing of high-quality genomic data** under the **Biotech-PRIDE (Promotion of Research and Innovation through Data Exchange) Guidelines**.
- **GenomeIndia Project:** Emphasized the significance of the **Genome India Project (GIP)**, led by the **Department of Biotechnology (DBT)**, this initiative creates a comprehensive database of India's genetic diversity.

Biotech-PRIDE Guidelines

- The "Biotech-PRIDE Guidelines," released in 2021 by DBT, enable the exchange of **biological data across research groups in India**.
 - They provide a framework for sharing knowledge, ensuring better integration, decision-making, and equitable access.
 - They promote timely sharing, avoid duplication, and maximize the benefits of public investment in research.

- The guidelines will be implemented through the **Indian Biological Data Centre (IBDC)** at the **Regional Centre for Biotechnology (RCB), Haryana**.
 - Under the Biotech-PRIDE Guidelines, existing datasets will be connected to the IBDC, forming the **Bio-Grid**.
 - This Bio-Grid will serve as a **National Repository for biological data**, enabling its exchange while ensuring safety, standards, and quality, and establishing clear data access protocols.
 - The RCB, established by the DBT, focuses on biotechnology education, research, and training.
 - It is recognized as an **Institution of National Importance in 2016**, RCB fosters innovation and develops skilled human resources to address challenges in health, agriculture, and the environment.

What is the GenomeIndia Project?

- **About:** The GIP is a flagship initiative launched in 2020 by the DBT, with the objective of **mapping the genetic diversity of India**.
 - It aims to **sequence and analyze the genomes** of India's diverse population groups, providing insights into the country's unique genetic makeup.
- **Objective:** Establish a **baseline genetic map** to study health, disease predisposition, and population-specific traits.
- **Scope:** The first phase of GIP involves sequencing the **genomes of 10,000 individuals across 99 ethnic groups**. Long-term plans aim to scale this to **1 million genomes**.
 - The second phase of the GIP focuses on sequencing genomes of individuals with **specific diseases like cancer, diabetes, and rare diseases**.
 - This will help identify genes linked to these conditions by comparing diseased genomes with healthy ones.
- **Significance for India:** With over **4,600 distinct population groups**, India's genetic diversity is unparalleled.
 - The project aims to uncover **genetic factors unique to Indian populations**, such as rare diseases and **mutations like MYBPC3**, linked to early cardiac arrest, which are not found in **global databases**.

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Note:

Genome Sequencing

- **Deoxyribonucleic Acid:** The DNA is a molecule that carries **genetic information**. It is the blueprint for the growth, development, and functioning of all living organisms.
 - DNA is a two-stranded molecule with a twisted shape, known as a **double helix**.
 - Each strand of DNA is composed of **nucleotides**, which include a **phosphate molecule**, a deoxyribose sugar, and a **nitrogen-containing base**.
- **Genome:** The genome is the complete set of **DNA instructions in a cell**. In humans, it consists of **23 pairs of chromosomes**.
 - One copy of the human genome contains approximately **3 billion base pairs of DNA**, distributed across these **23 chromosomes**.
 - The genome holds all the information necessary for an individual's development and functioning.
- **Genes:** The **basic units of heredity** passed from parent to child. They are made up of **DNA sequences** and are arranged at specific locations on chromosomes within the cell's nucleus.
- **Genome Sequencing:** It involves deciphering the order of the **nucleotide bases (adenine (A), cytosine (C), guanine (G), and thymine (T))** in the **Deoxyribonucleic Acid (DNA)**.
 - This process helps in understanding the genetic makeup of an individual, revealing insights into **traits, health risks, and potential diseases**.
 - Genome Sequencing can be focused on a particular gene, region, or small section of the genome.
- **Whole Genome Sequencing (WGS):** Involves sequencing the entire genome of an organism in one go, including all of its **genes and non-coding regions** (the entire DNA sequence).
 - **WGS** provides a complete and comprehensive map of an organism's genetic material.

Difference Between Gene Editing and Gene Sequencing:

Characteristics	Gene Sequencing	Gene Editing
Definition	The process of determining the precise order of nucleotides (A, T, C, G) in a DNA or RNA molecule.	The process of making targeted modifications to the DNA sequence of a gene or genes.
Purpose	To obtain the complete or partial sequence of a gene, a set of genes, or an entire genome.	To introduce desired changes, such as correcting genetic defects, modifying gene expression, or introducing new genetic traits.
Techniques	Sanger sequencing, Next-Generation Sequencing (NGS), and others.	CRISPR-Cas9, zinc finger nucleases, TALENS, and other specialised tools.
Outcome	Provides information about the genetic makeup and composition of an organism.	Allows for the direct manipulation and alteration of the genetic code.
Modification	Does not directly modify the genetic material.	Enables the addition, removal, or alteration of specific DNA sequences.

What are the Key Benefits of Indigenous Genomic Data?

- **Personalized Medicine:** The healthcare system in India faces challenges due to a **one-size-fits-all approach**, where treatments often do not account for the **genetic diversity of the population**.
 - IGD enables **tailored healthcare solutions for India's demographic**, improving treatment effectiveness and outcomes.
- **Bioeconomy Growth:** IGD will **fuel India's growing bioeconomy**, which has surged from USD 10 billion in 2014 to over USD 130 billion in 2024.

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Note:

- **Positioning India as a Global Leader:** India ranks 12th globally in biotech and 3rd in Asia-Pacific.
 - As the **largest vaccine producer with over 8,500 biotech startups** in 2023, India is set to lead the global bioeconomy.
 - IGD reduces dependence on foreign databases, positioning India as a hub for genomic innovation.
 - Under the new **BioE3 (Biotechnology for Economy, Environment and Employment) Policy**, this data will propel India to global leadership in biotechnology, advancing the nation's role in the **4th industrial revolution**.
- **Enhanced Genetic Tools:** IGD facilitates the creation of genomic tools and diagnostic tests specific to regional genetic variations, improving accuracy in healthcare.
- **Agricultural and Environmental Research:** Provides insights into genetic diversity that can improve crop breeding, disease resistance, and environmental sustainability.

What are India's Other Initiatives for Biotechnology Development?

- **BioE3 Policy**
- **National Biotechnology Development Strategy 2020-25**
- **National Biopharma Mission**
- **Biotech-KISAN Scheme**
- **Atal Jai Anusandhan Biotech Mission**
- **One Health Consortium**
- **Biotech Parks**
- **Biotechnology Industry Research Assistance Council (BIRAC)**
- **IndiGen Project:** Launched in 2019 by the **Council of Scientific and Industrial Research (CSIR)**, aims to map the genetic makeup of Indians to better understand disease susceptibility and drug responses.

Genomic Projects Across the World

- The **Human Genome Project**, an international collaboration funded by the US National Institutes of Health, completed the **world's first full human genome sequence in 2003**.

- The EU's '**1+ Million Genomes**' (1+MG) initiative seeks to provide secure access to genomic and clinical data across Europe, supporting research, health policy, and personalized healthcare to improve disease prevention.
- The **Earth BioGenome Project (EBP)** is a global initiative, aimed at sequencing and cataloging the **genomes of all known eukaryotic species on Earth**. This ambitious project is supported by India, China and the US.

Plasticiser Degradation Using Bacterial Enzymes

IIT Roorkee has successfully used the **esterase enzyme**, produced by the **soil bacterium *Sulfobacillus acidophilus***, to break down the **plasticizer Diethyl Hexyl Phthalate (DEHP)**.

- This advancement addresses the growing environmental and health concerns posed by plasticisers.

Note: Plasticisers (chemicals added to **plastics and personal care products** to improve flexibility and shine) like DEHP, found in **baby toys, food containers**, etc are harmful pollutants.

- **Plasticisers are additives** used to make **rigid plastics like PVC (polyvinyl chloride) more flexible and softer** by reducing intermolecular forces within the polymer chains. This is particularly relevant to plastic products **requiring durability and flexibility**, such as cables, hoses, and films.
- They are **carcinogens**, posing health risks through **skin absorption or ingestion**. As **persistent organic pollutants**, they contaminate water and soil, harming ecosystems and aquatic life.

How Do Bacterial Enzymes Work in Degrading Plasticisers?

- **Mechanism of Action:** The esterase enzyme breaks down DEHP plasticizer into two products- **modified phthalate** (affect biological system) and **alcohol compound (impact the environment)**.
 - These are further broken down by other enzymes into harmless substances like **Water and Carbon Dioxide**.

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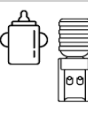
Note:

- **Structural Insights:** X-ray crystallography (technique that uses X-rays to determine the atomic and molecular structure of a crystal) identified active sites on the esterase enzyme, elucidating the mechanism by which DEHP is targeted and broken down.
- **Sustainability:** The integration of these enzymes into bacteria ensures prolonged activity and continuous degradation without requiring frequent enzyme replacement.
- **Efficiency:** Lab experiments show significant efficiency in **degrading high molecular weight plasticisers, providing an edge** over previously reported methods.

Which plastics are recyclable?

Summary of plastic polymer groups, their common uses, properties and recyclability.

Numerical coding (from 1-7) is typically provided on plastic items and gives information of their polymer grouping below. Recyclability is based on common recycling schemes but can vary between countries as well as regionally within countries; check local recycling guidelines for further clarification.

Symbol	Polymer	Common Uses	Properties	Recyclable?
 PETE	Polyethylene terephthalate	 Plastic bottles (water, soft drinks, cooking oil)	Clear, strong and lightweight	Yes; widely recycled
 HDPE	High-density polyethylene	 Milk containers, cleaning agents, shampoo bottles, bleach bottles	Stiff and hardwearing; hard to breakdown in sunlight	Yes; widely recycled
 PVC	Polyvinyl chloride	 Plastic piping, vinyl flooring, cabling insulation, roof sheeting	Can be rigid or soft via plasticizers; used in construction, healthcare, electronics	Often not recyclable due to chemical properties; check local recycling
 LDPE	Low-density polyethylene	 Plastic bags, food wrapping (e.g. bread, fruit, vegetables)	Lightweight, low-cost, versatile; fails under mechanical and thermal stress	No; failure under stress makes it hard to recycle
 PP	Polypropylene	 Bottle lids, food tubs, furniture, houseware, medical, rope, automobile parts	Tough and resistant; effective barrier against water and chemicals	Often not recyclable; available in some locations; check local recycling
 PS	Polystyrene	 Food takeaway containers, plastic cutlery, egg tray	Lightweight; structurally weak; easily dispersed	No; rarely recycled but check local recycling
 OTHER	Other plastics (e.g. acrylic, polycarbonate, polyactic fibres)	 Water cooler bottles, baby cups, fiberglass	Diverse in nature with various properties	No; diversity of materials risks contamination of recycling

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Note:

What is Plastic?

- **About:** **Plastic** is a **lightweight, durable, and hygienic material** that is easy to mold into various forms and **is cost-effective to produce**.
 - Most plastics **do not decompose naturally**. Instead, they slowly break down into smaller pieces called **microplastics**.
- **Status of Plastic Production:** In **2023**, the world produced **413.8 million metric tons (mt)** of plastic. This is a sharp increase from 1950, when the world produced only two million tons.
 - **India** leads the world in generating plastic waste, **producing 10.2 million tonnes a year**.
- **Types of Plastics:**
 - **Biodegradable Plastic:** This type of plastic **degrades through biological or microbial processes** and are derived from **fossil fuels** or renewable sources but are designed to break down more quickly under specific conditions.
 - Not all plastics are biodegradable, and some conventional plastics persist in the environment for long periods.
 - **Bioplastics:** These are both **biodegradable and bio-based**, made from natural materials like corn, etc.
 - **Compostable Plastic:** These plastics are a subset of biodegradable plastics, made from renewable materials such as **corn, starch, etc**. They are **non-toxic and decompose naturally** into carbon dioxide, water, and biomass through composting.

prompting questions about their causes, the role of **climate change**, and potential solutions.

- Authorities are using **pink fire retardants** to control the wildfires.

Note: In India, as per the **India State of Forest Report (ISFR) 2021** published by the **Forest Survey of India (FSI)**, **35.47%** of the forest cover is prone to fire.

What are the Causes and Impacts of Frequent Wildfires in California?

- **Natural Causes:**
 - **Lightning Strikes:** Lightning Strikes **ignite dry vegetation** like trees and grass, triggering uncontrollable fires, especially when combined with strong winds. This is **common during dry seasons**.
 - **Climate Change:** California, in the last **two winters (2022 and 2023)** saw **heavy rainfall**, promoting vegetation growth.
 - The **unusually dry winters of 2024-2025** have **dried out vegetation** in Los Angeles, **turning it into fuel for wildfires**.
 - **Global warming** has also exacerbated dry and wet seasons, leading to prolonged **droughts** and **reduced moisture in vegetation**, which has led to a rise in **frequency and severity of wildfires**.
 - **Santa Ana Winds:** The **Santa Ana winds** in California, typically strong between **October and January**, have been exceptionally **powerful in 2025**.
 - The winds originate from **high-pressure systems** in the **Great Basin** and blow hot, **dry air** from **east to west**, flowing down towards the Pacific coast.
 - As air **descends the Sierra Nevada and Santa Ana mountains** and passes through valleys, it **gets compressed**, which raises its **temperature and reduces humidity**.
 - In Southern California, these winds **exacerbate wildfires by rapidly** spreading flames across dry vegetation, power lines, and buildings.

Wildfires in California

Why in News?

Los Angeles, California, is battling devastating **wildfires**, with fatalities and structural losses, as authorities deploy pink fire retardants to contain the flames.

- These wildfires have been occurring with **increasing frequency** and **outside the usual wildfire season**,

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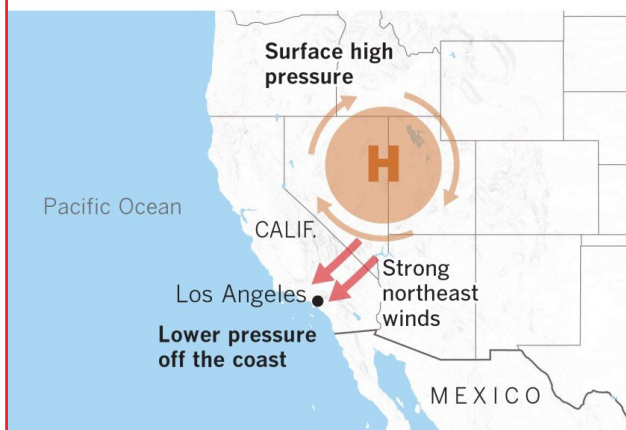


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Note:

Santa Ana winds



- **Human Intervention:** According to the US National Park Service, **human activities** account for approximately **85%** of wildfires in the US.
 - **Campfires:** Unattended or **improperly extinguished campfires** are major human-induced causes of wildfires.
 - **Roadside Ignition:** Sparks from vehicles, such as dragging chains or malfunctioning **catalytic converters**, can **ignite fires** along highways.
 - **Power Lines:** Faulty or wind-disturbed power lines often trigger wildfires.
 - **Other Human Activities:** Equipment malfunctions, arson, and discarded cigarettes also contribute to wildfire outbreaks.
 - Sometimes **smugglers and wildlife traffickers** ignite **wildfires** to **divert the attention of security forces** or to **destroy the evidence of crime**.
- **Impact of Wildfires:**
 - **Economic loss** from destruction of life and property.
 - **Air pollution** by small particulate matter and also acids, organic chemicals, and metals along with dust and allergens.
 - **Land degradation** as high temperatures consume all nutrients and vegetation from a land, leaving it barren and infertile.
 - **Loss of biodiversity**

What is Pink Fire Retardant?

- **About:**
 - It is a chemical mix used to **slow or extinguish wildfires**.
 - It primarily contains **ammonium phosphate-based slurry** with salts like **ammonium polyphosphate** and toxic metals like **chromium** and **cadmium**.
 - A commonly used fire retardant in the US is **Phos-Chek**.
 - **Phos-Chek** is a **mixture of water, ammonium phosphate-based fertilizers** (diammonium phosphate and ammonium polyphosphate), and a **red dye (iron oxide)** for visibility.
 - It also includes **thickening agents** to enhance its stickiness and prevent drift during aerial application.



- **Function:** It is sprayed ahead of fire that **coats vegetation to prevent oxygen from aiding combustion**.
 - **Pink** is chosen because it is **highly visible**, helping firefighters target fire lines more effectively.
- **Concerns:** Toxic metals like chromium and cadmium cause **cancer and organ damage**, and pose **severe risks to aquatic life** when they contaminate waterways.

Sovereign AI

Why in News?

The government is investing in **semiconductors** and **Artificial Intelligence (AI)** to ensure **AI sovereignty** as India's **digital economy** is aiming for **USD 1 trillion** by **2028**.

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Note:

Artificial Intelligence(AI)

AI is the simulation of human intelligence in machines programmed to think and learn like humans, capable of problem-solving, reasoning, and adapting to new information.

AI Timeline - Major Milestones

- 1950s** Turing Test Proposed; First AI Programs Developed
- 1956** Dartmouth Conference Coins "Artificial Intelligence"
- 1960s** Eliza Chatbot Created; Early Neural Networks Emerge
- 1996** Deep Blue - a Chess-Playing Program
- 2012** Deep Learning Breakthrough in Image Recognition
- 2014** Generative Adversarial Networks (GANs) Introduced
- 2020** GPT-3 Demonstrates Advanced Language Generation
- 2022** Chatgpt Launches, Bringing Conversational AI to Masses
- 2023** Generative AI Boom; Major Tech Companies Release AI Models



Applications of AI

- **Healthcare:** Personalised medicine
- **Finance:** Algorithmic trading
- **Transportation:** Autonomous vehicles
- **Marketing & Customer Service:** Targeted advertising, chatbots
- **Education:** Adaptive learning systems, personalised tutoring
- **Agriculture:** Crop monitoring
- **Cybersecurity:** Threat detection
- **Energy:** Smart grid management, consumption forecasting

Concerns

- Deepfakes & misinformation
- Algorithmic bias
- Automation & job displacement
- Privacy issues
- Data ownership & liability issue
- Ethical decision-making complexes

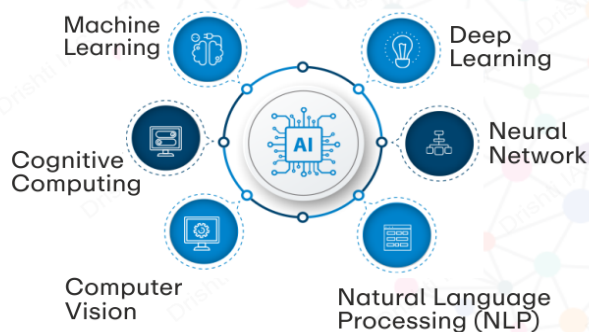
Regulating AI

- **Global Partnership on AI (GPAI)** launched in 2020
- **Bletchley Declaration (2023):** Enhance Global Collaboration on AI
- **G20 New Delhi Leaders' Declaration (2023):** Harnessing AI responsibly for good and for all
- **Hiroshima AI Process (2023)** by G7

India and AI

- **National Strategy For AI 2018**
- **AI For All:** Self-learning online program
- **GPAI Summit 2023** hosted by India
- **IndiaAI Mission 2024**
- **US India Artificial Intelligence (USIAI) Initiative:** AI cooperation in critical areas
- **AIRAWAT** (AI Research, Analytics and Knowledge Assimilation Platform): Supercomputer

KEY COMPONENTS OF AI



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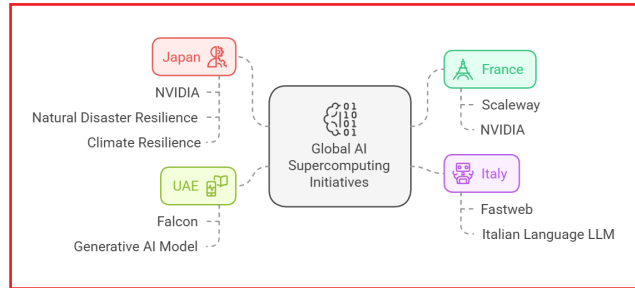
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Note:

What is Sovereign AI?

- **About:** Sovereign AI refers to a nation's ability to develop, control, and deploy artificial intelligence using its own infrastructure, data, workforce, and business networks.
 - This includes developing AI models, infrastructure, and fostering talent within the country.
 - **Growth of AI:** In 2018, a 340-million-parameter model was considered **large (LLMs)**, while today, ChatGPT has 1.8 trillion parameters, Gemini has 1.5 trillion, and China's DeepSeek has 240 billion.
 - Parameters are **internal variables** that are **adjusted** during **training** to improve a model's performance.
- **Key Aspects:**
 - **National Control:** Sovereign AI ensures alignment with **national laws, regulations, and ethics**.
 - **Data Sovereignty:** It emphasizes data control within borders, **safeguarding privacy and national security**.
 - **AI in Governance:** **Generative AI** is reshaping markets, governance, industries, and work dynamics, with **AI-powered copilots** assisting professionals.
 - **Ethical Considerations:** Nations set **security protocols and ethical standards** for AI use.
 - **Strategic Autonomy:** Sovereign AI reduces reliance on **foreign technologies**, promoting domestic AI development.
 - **Economic Competitiveness:** AI is key to industrial innovation; without it, India risks falling behind globally.
 - **Various Applications:** Sovereign AI is used in critical sectors like **defense, healthcare, and transportation**.
- **India's Position:** Tata Group and Reliance are developing **AI infrastructure and Large Language Models (LLMs)** for India.
 - India allocated **USD 1.2 billion** for a sovereign AI project, including an **AI supercomputer** with thousands of chips under **IndiaAI Mission**.
- **Global AI Cooperation:** A proposed **Global AI Compact** suggests that **AI resources** should be shared across nations, ensuring **equitable access to critical technologies**.



67th Foundation Day of DRDO

Why in News?

Recently, the **Defence Research and Development Organisation (DRDO)** celebrated its **67th Foundation Day** on **1st January** and paid tributes to former President **Dr. APJ Abdul Kalam**, the **Missile Man of India**.

- The event highlighted the significant strides DRDO has made in bolstering India's defense capabilities.

What are the Key Facts About DRDO?

- **About:** DRDO was established in 1958 by merging the **Technical Development Establishment (TDEs)** of the Indian Army, the **Directorate of Technical Development and Production (DTDP)**, and the **Defence Science Organisation (DSO)**.
 - DRDO is the R&D wing of the **Ministry of Defence**, Government of India.
 - DRDO initially had 10 laboratories, it currently operates 41 laboratories and 5 **DRDO Young Scientist Laboratories (DYSLs)**.
- **Philosophy:** The guiding principle of DRDO is **"Balasya Mulam Vigyanam" (Strength lies in science)**, driving the nation in both peace and war.
- **Mission:** Achieve **self-reliance in critical defence technologies** and systems while equipping the Indian armed forces with state-of-the-art weapon systems and equipment, as per the requirements of the three Services.
- **Technology Clusters of DRDO:** A committee under the chairmanship of **Dr. P. Rama Rao** was constituted in 2007 to conduct a comprehensive review of the DRDO.
 - This led to the creation of **seven technology domain-based clusters**, each headed by a Director General.

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Note:

- **Aeronautics Systems (Aero):** Focuses on unmanned aerial vehicles (UAVs), aerostats, and related technologies.
 - **Missiles and Strategic Systems (MSS):** Develops missile systems, including long and short-range missiles, and related technologies.
 - **Naval Systems and Materials (NSM):** Works on naval platforms, underwater systems, including sonar systems and submarine technologies.
 - **Micro Electronic Devices (MED) and Computational Systems (CoS):** Focuses on electronics, radars, cyber security, and artificial intelligence for defense applications.
 - **Armament and Combat Engineering Systems (ACE):** Involves the development of armaments, ammunition, explosives, and combat vehicles.
 - **Electronics and Communication Systems (ECS):** Specializes in military electronics, sensors, communication systems, and electronic warfare technologies.
 - **Soldier Support System (SSS):** Equipping the armed forces with advanced weapon systems must be complemented by optimizing the psychological, physiological, and nutritional well-being of personnel.
- **Key Achievements of DRDO:**
- **Achievements of DRDO in 2024:**
 - **System Handovers:** DRDO handed over multiple advanced systems notable systems include:
 - **Air Defence Systems:** Air Defence Tactical Control Radar (ADTCR), Air Defence Fire Control Radar (ADFCR).
 - **Missile Systems:** Long Range Land Attack Cruise Missile (LR-LACM), Quick Reaction Surface to Air Missile (QRSAM), and Medium Range Anti-ship Missile (MRASHM).
 - **Advanced Platforms:** Multi-Mission Maritime Aircraft (MMMA), SCA (Signal Intelligence and COMJAM Aircraft), and Anti-Tank Influence Mine PRACHAND.
 - **AI Tools:** DRDO developed 'Divya Drishti,' an AI tool that integrates face recognition with immutable physiological traits like gait (pattern of walking) and skeleton.
 - **Flagship Programs:** Two flagship programs **Full Scale Engineering Development (FSED) of Advanced Medium Combat Aircraft (AMCA)** and a new **Missile Test Range in Andhra Pradesh**, were sanctioned by the Cabinet Committee on Security (CCS).
 - **Missile Systems:**
 - Air-to-Air Missile: MICA, Astra Missile
 - Surface-to-Air Missiles: Trishul, Akash, Barak 8
 - Surface-to-Surface Missiles: Agni, Prithvi, Dhanush, Shourya
 - Cruise Missiles: BrahMos, Nirbhay
 - **Combat Aircraft:** Indigenous Fighter Jet Light Combat Aircraft (LCA) Tejas.
 - **Rocket Systems:** Multi-barrel rocket launcher Pinaka.
 - **Naval Systems:** Humsa, Nagan (sonar system), Ushus (Submarine Sonar Suite), Mihir (helicopter sonar system).
 - **Main Battle Tank:** Arjun.
 - **Unmanned Aerial Systems (UAS):**
 - **Lakshya:** Reusable aerial target system for training, launched from land/ship with tow targets.
 - **Nishant:** Multi-mission UAV for surveillance and artillery correction with autonomous flight and parachute recovery.

What are the Contributions of Dr. APJ Abdul Kalam to DRDO?

- **Leadership in IGMDP:** Dr. Kalam was instrumental in the creation and execution of the **Integrated Guided Missile Development Program (IGMDP)**, launched in 1983.
- His leadership led to the successful development of the **Prithvi, Trishul, Akash, Nag, and Agni** missiles, positioning India as a member of the **exclusive group of missile-producing nations** and earning him the title of 'Missile Man of India.'
 - Under Dr. Kalam's leadership, DRDO achieved breakthroughs in missile technologies like **propulsion, navigation, control systems, and aerodynamics**, leading to **indigenous missile**

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Note:

systems and reduced dependency on foreign suppliers.

- **Integrated Guided Missile Development Program:** The IGMDP was a program initiated by the **Indian Ministry of Defence** in 1982–1983 under the leadership of **Dr. APJ Abdul Kalam**, aimed at researching and developing a wide array of missiles.
 - The program's primary objective was to **reduce dependency on imports and build indigenous expertise** in areas such as propulsion, navigation, and control systems.
 - The program resulted in the development of key missile systems such as **Prithvi, Trishul, Akash, Nag, and Agni**.
 - Concluding in 2008, IGMDP also provided significant technological spin-offs, strengthened India's strategic deterrence, and contributed to the development of the **defense-industrial base**, in alignment with the **'Make in India' initiative**.

Key Facts About Dr. APJ Abdul Kalam

- **Born:** Dr. Avul Pakir Jainulabdeen Abdul Kalam born on **15th October 1931**, Rameswaram, Tamil Nadu.
- **President:** Served as India's **11th President** from **2002 to 2007**.
- **Awards:** **Padma Bhushan (1981)**, **Padma Vibhushan (1990)**, and **Bharat Ratna (1997)**.
- **Literary Works:** *Wings of Fire*, *India 2020 - A Vision for the New Millennium*, *My Journey*, *Ignited Minds*.
- **Contributions:**
 - **ISRO:** Project Director for India's first indigenous **Satellite Launch Vehicle (SLV-III)**.
 - Successfully launched the **Rohini satellite** into near-earth orbit (July 1980).
 - Played a key role in evolving ISRO's launch vehicle program, particularly in developing configurations for **PSLV (Polar Satellite Launch Vehicle)** configuration.
 - Pioneer at ISRO, leading the development of **fiberglass technology** (fibrous form of glass).
- **Pokhran-II:** Led India's nuclear tests in collaboration with the **Department of Atomic Energy**, making India a nuclear weapon state.

- **Pokhran-II:** Dr. Kalam led the **Pokhran-II nuclear tests in 1998**, which were conducted in collaboration with the **Department of Atomic Energy**.
- **Vision 2020:** Proposed a national plan to transform India from a developing to a developed nation by 2020.
- **Kalam-Raju Stent:** Co-developed an affordable stent for **coronary heart disease with cardiologist B. Soma Raju**.



3 Years of Open Network for Digital Commerce

Why in News?

The **Prime Minister of India** highlighted the **Open Network for Digital Commerce (ONDC)** for its transformative impact on **e-commerce** and its role in **empowering small businesses**.

- ONDC recently completed 3 years with over **15 million monthly transactions**, making strides in combating platform monopolies and promoting a level playing field.

What is Open Network for Digital Commerce?

- **About:** ONDC Launched in April 2022 by **Department for Promotion of Industry and Internal Trade (DPIIT)**, Ministry of Commerce, Government of India. It aims to democratize **digital commerce** through an **open, inclusive, and interoperable platform**.

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Note:

- ONDC was incorporated as a **non-profit company** in December 2021, with the **Quality Council of India** and **Protean eGov Technologies Limited** as Founding Members.

➤ **Objectives:**

- **Democratization of Commerce:** Promoting interoperability to reduce the dominance of **monopolistic e-commerce platforms**.
- **Cost Efficiency:** Lowering costs for **customer acquisition and transaction processing**.
- **Market Expansion:** Bridging **regional and linguistic gaps** for wider market participation.
- **Consumer Empowerment:** Providing **diverse product and service options** to buyers, with lower prices through discounts and promotions, enhancing choices and fostering competitive pricing.

Benefits of ONDC		
Sr. No.	Stakeholder	Benefit
1	Sellers	➤ Access to a wider audience
		➤ Reduced dependence on large platforms
		➤ Enhanced revenue opportunities
2	Buyers	➤ Increased options for products and services
		➤ Competitive pricing due to broader seller participation
3	Service Providers	➤ Opportunities for logistics, fintech, and IT service providers to integrate into the network
4	Consumers	➤ Discover sellers, products, and services on any compatible platform
		➤ Match demand with nearby suppliers and choose local businesses

➤ **Key Features:**

- **Open Protocol:** Built on **open-source methodology** (which can be accessed by everyone) and protocols, ONDC allows buyers and sellers to transact seamlessly across different platforms and applications.
- **Role Segregation:** Participants include **Buyer Apps** (Connect consumers and sellers), **Seller Apps** (Interfaces for businesses to list and manage products), **Logistics Providers** (Ensure efficient transport), **Tech Enablers** (Provide IT tools).

➤ **Sectoral Scope:** ONDC facilitates diverse domains, from food, grocery, and fashion to financial services, agriculture, and health.

➤ **ONDC Benefits:**

- **MSMEs:** ONDC empowers **Micro, Small and Medium Enterprises (MSME)** by enhancing **nationwide visibility**, reducing **reliance on high-cost platforms**, and lowering operational expenses.

- It offers training programs to **build digital skills and focuses on inclusivity** by supporting **women-owned and Scheduled Castes and Scheduled Tribes led enterprises** through initiatives like the **MSME-TEAM scheme**.

- **Startups:** The **ONDC Startup Mahotsav** fosters collaboration, offering startups opportunities in logistics, IT, and seller-buyer platforms to integrate into a vast e-commerce network.

➤ **ONDC Initiatives for Awareness:**

- ONDC is conducting workshops with industry associations like **Federation of Indian Chambers of Commerce & Industry (FICCI)** to educate small businesses.
- ONDC collaborates with **Bhashini** to enhance app development and e-commerce in Indic languages.
 - The “ONDC Sahayak” WhatsApp Bot provides information in 5 languages.

➤ **Achievements of ONDC:** ONDC has successfully piloted in cities like **Bengaluru and Delhi**, with the **Department of Food and Public Distribution** launching a **Fair Price Shop** pilot in Himachal Pradesh.

- Initially starting with **Food and beverage (F&B)** and Grocery, ONDC has expanded to categories like Mobility, Fashion, Health, and B2B.
- As of January 2024, it covers **over 616 cities, broadening its geographical reach**.

➤ **Awards and Recognition:** In 2024, ONDC received “**Application of Emerging Technologies for providing Citizen Centric Services**” at the National Awards for e-Governance and it was recognized as the “**Start-up of the Year**” at the **14th India Digital Awards (IDA)**.

- In 2023, ONDC was recognized as the “**FinTech Company of the Year**” at the **Global Fintech Awards**.

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Note:

Thorium-based Nuclear Energy Production

Why in News?

India's largest power generator, **National Thermal Power Corporation (NTPC) Limited** has signed a **strategic pact** with US-based **Clean Core Thorium Energy (CCTE)** to explore development and deployment of **advanced nuclear energy for enriched life (ANEEL)**, thorium-based fuel.

- Developed by CCTE, Aneel is a **thorium-based fuel** for **pressurised heavy water reactors (PHWRs)**.
- The Department of Atomic Energy (DAE) plans to utilize India's abundant **thorium** reserves in its **three-stage nuclear power program** as a long-term strategy.

What is Advanced Nuclear Energy for Enriched Life (ANEEL)?

- **About:** ANEEL is a patented **nuclear fuel** that is a blend of **Thorium** and **High Assay Low Enriched Uranium (HALEU)**.
 - The fuel is named to honor **Dr. Anil Kakodkar**, one of India's foremost nuclear scientists.
 - HALEU is **uranium enriched between 5% and 20%**, required for many advanced nuclear reactor designs.
 - It is currently produced at scale only in **Russia and China**, with limited production in the US.
- **Compatibility with PHWRs:** ANEEL fuel can be used in **existing PHWRs**, which are the backbone of India's nuclear power fleet.
 - Presently, India has **22 operating reactors**, with an installed capacity of **6780 MWe**. Among these **18 reactors** are PHWRs and **4 are Light Water Reactors (LWRs)**.
 - India is **building 10 more PHWRs**, each with a capacity of **700 MW**.
- **Ease of Thorium Deployment:** ANEEL provides an **easier and quicker alternative** for the deployment of thorium leveraging imported HALEU.
 - India's traditional approach involves creating **thorium blankets around uranium or plutonium**

reactors to generate **uranium-233**, which is time-intensive.

- **Benefits:**
 - **Efficiency:** ANEEL fuel has a burn-up efficiency of **60,000 MW-days per tonne**, compared to **7,000 MW-days per tonne** for conventional natural uranium.
 - In a typical **220 MW PHWR**, the use of ANEEL fuel reduces the lifetime bundle requirement **from 1,75,000 to 22,000**, cutting waste volume and operational costs significantly.
 - **Non-Proliferation:** Thorium and spent ANEEL fuel is **non-weaponizable**, easing proliferation concerns for foreign uranium suppliers and reactor operators.
 - **Economic and Environmental Impact:** ANEEL fuel **reduces operating costs** for reactors due to its higher efficiency and longer-lasting fuel bundles.
 - It aligns with **India's clean energy goals** and the global commitment to **tripling nuclear capacity**, as highlighted during **COP28, Dubai, UAE**.
 - **Global Collaboration:** The HALEU-thorium blend in ANEEL has gained **global attention** as **Canadian Nuclear Laboratories** signed an MoU with CCTE to advance ANEEL fuel research and licensing.

Thorium

- **About:** Thorium is a **silvery, slightly radioactive metal**. It is commonly found in **igneous rocks** and **heavy mineral sands**.
- **Abundance:** Thorium is **three times more abundant** in the Earth's crust than uranium, with an average concentration of **10.5 parts per million (ppm)** of thorium, compared with about **3 ppm of uranium**.
- **Fissionable but Not Fissile:** The only naturally occurring isotope of **thorium** is thorium-232, which is **fissionable (can undergo fission) but not fissile (cannot sustain a chain reaction without external neutrons)**.
 - Thorium-232 requires **high-energy neutrons** to undergo fission.

What is a Thorium-based Nuclear Reactor?

- **About:** Thorium-based Nuclear Reactor uses **thorium-232 as a primary fuel** instead of uranium-235 or plutonium-239.

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Note:

- Thorium is **not a fissile material but a fertile material**, meaning it requires **pairing with Uranium-235 or Plutonium-239** to be used as nuclear fuel.

- To **initiate and sustain** the nuclear reaction, thorium must be used along with a fissile material such as ^{233}U , ^{235}U or ^{239}Pu .

➤ Fuel Cycle Strategies:

- **Thorium with Low Enriched Uranium (LEU):** LEU has a ^{235}U enrichment of **19.75%** and is mixed with thorium to form **Thorium-LEU Mixed Oxide (MOX) fuel**.
- **Thorium with Plutonium (Pu):** This configuration uses **plutonium** as an external fissile feed.

➤ Advantages:

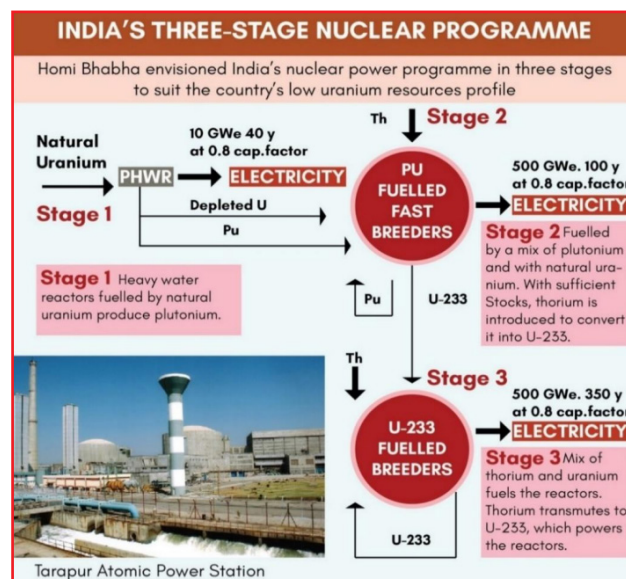
- **Reduced Nuclear Waste:** Thorium-based reactors produce significantly **fewer long-lived minor actinides** (ionizing radiation emitting elements) compared to uranium-plutonium fuel cycles.
- **Safety:** The presence of ^{232}U in spent fuel introduces **hard gamma radiation**, deterring weaponization.
- **Recycling Potential:** Lower non-fissile absorption in ^{233}U facilitates multiple recycling cycles, improving fuel efficiency.
- **Enhanced Fuel Utilization:** Thorium can generate **more fissile uranium-233 than it consumes** in water-cooled or molten-salt reactors, ensuring efficient fuel use.

➤ Challenges:

- **Extraction Costs:** Thorium extraction is **costly**, as it is a **by-product of monazite mining** driven by rare earth demand, making dedicated mining uneconomical.
- **Dependence on Fissile Drivers:** Thorium is a **fertile mineral**. It requires an **external fissile material** like **uranium-235 or plutonium-239** to initiate and sustain a chain reaction.
- **Limited Experience:** Most nuclear power systems are **historically optimized for uranium**, leading to limited research, development, and operational experience with thorium.

What is India's 3-Stage Nuclear Power Program?

- **About:** It is a strategy to develop nuclear energy that focuses on the **judicious utilization of limited uranium resources** and the **vast thorium reserves** available in the country.
 - It was formulated by **Dr. Homi Bhabha** to address India's long-term energy needs and ensure self-reliance.
- **3-Stages:** The 3-stage strategy integrates different types of reactors to gradually transition to thorium-based power generation.
 - **Stage I:** It includes the setting up of **PHWRs** and uses natural uranium (U-238) as fuel and **heavy water (deuterium oxide)** as coolant and moderator.
 - The spent fuel from these reactors is **reprocessed to obtain Plutonium**.
 - **Stage II:** It envisages use of **Fast Breeder Reactors (FBRs)** fuelled by **plutonium** produced in Stage I reactors.
 - In addition to using plutonium, **FBRs breed uranium-233 (U-233)** from thorium.
 - **Stage III:** It envisages use of **Thorium-Based Reactors** using **uranium-233 (U-233)** and thorium as fuel.
 - Stage III aims to use U-233, bred from **thorium**, as India's **primary nuclear fuel**.



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Note:

Note: The operationalisation of the **prototype fast breeder reactor (PFBR)** will mark the start of **stage II** of India's three-stage nuclear power programme.

- The PFBR is a machine that **produces more nuclear fuel than it consumes**.
- Operationalisation of an **indigenous PFBR** has been initiated at the **Madras Atomic Power Station in Kalpakkam, Tamil Nadu**.

India as Global Hub For Data Centres

Why in News?

India's data centre sector is witnessing significant growth, projected to double its capacity by FY27, driven by digitalization, the adoption of **Artificial Intelligence (AI)**, the rollout of **5G**, and **data localization** laws.

- However, challenges remain, such as infrastructure gaps, the need for sustainable power solutions, and competition from global players like China.

What are Data Centres?

➤ About:

- Data centres are **specialized facilities used to store, manage, and process large volumes of electronic data**.
- These centres house **critical Information Technology (IT) infrastructure**, including **servers, storage devices, and networking equipment**, along with systems for **cooling, power supply, and security**.
- They are designed to **provide reliable and scalable solutions for data storage, processing, and management**.

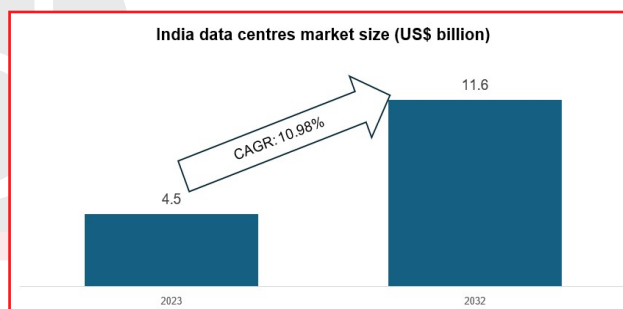
➤ Components of a Data Centre:

- **Servers and Storage Systems:** These are responsible for handling workloads such as **hosting websites, running applications, and managing cloud storage**.
- **Networking Equipment:** **Routers**, switches, and **firewalls** that facilitate communication between various servers and external networks.

- **Power Supply Systems:** **Uninterrupted power supply (UPS)** and backup generators to ensure continuous power availability.
- **Cooling Systems:** Since servers generate a significant amount of heat, efficient cooling mechanisms, such as **air conditioning or liquid cooling systems**, are crucial to prevent overheating and ensure smooth operation.
- **Security Infrastructure:** Physical and cybersecurity measures to protect data and infrastructure from unauthorized access, data breaches, and other **cyber threats**.

➤ Current Status of Data Centres in India:

- **Growth Projection:** India's data centre market is forecasted to grow significantly, from USD 4.5 billion in 2023 to **USD 11.6 billion by 2032**, reflecting a **compound annual growth rate (CAGR)** of 10.98%.



- **Global Data Share vs. Local Capacity:** While India accounts for **20% of global data production**, it currently holds **only 3% of the global data centre capacity**, showcasing a significant growth opportunity for the sector.
- **Geographical Distribution of Data Centres:** Over **50% of India's data centre capacity is concentrated in Mumbai**, benefiting from its strategic location, reliable power supply, and cable landing stations.
 - Smaller cities such as **Ahmedabad, Pune, and Vizag** are also emerging as important hubs due to lower costs and improving infrastructure.
 - India hosts around 150 data centres, with prominent players like Amazon Web Services (AWS), Microsoft Azure, Google Cloud, CtrlS, Sify, and Yotta leading the market.

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What are the Key Reasons for Growth of Data Centres in India?

- **Digitalization:** The increasing adoption of digital technologies, especially in **AI, cloud computing, and data storage**, has led to rising demand for **data processing** and **storage solutions**.
 - With **751.5 million internet users** and a **penetration rate of 52.4%** in 2024, India's growing reliance on mobile internet and digital solutions has driven the expansion of data centre networks to meet the rising demand for data processing and storage.
- **RBI Mandate on Financial Data Storage:** In 2018, the **Reserve Bank of India** issued a **data localization mandate** that required **all payment system data related to Indian customers to be stored in India** except in few cases, ensuring secure local storage and processing of sensitive financial data within India.
- **AI and 5G Rollout:** The surge in **AI and generative AI projects**, along with the nationwide **rollout of 5G networks**, is expected to increase data consumption and necessitate a corresponding rise in data centre capacity.
 - With the adoption of **5G, IoT, and AI**, data consumption is expected to triple.
- **Data Localization Laws:** India's data localization regulations mandate that certain types of data be stored within the country, creating further demand for local data centres. The key Legislation includes:
 - **Public Records Act, 1993:** **Public Records Act, 1993** prohibits the removal of public records from India, introducing the first local data storage requirement.
 - **Digital Personal Data Protection Act, 2023:** **Digital Personal Data Protection Act, 2023** establishes baseline privacy protections and allows for sector-specific regulations to impose stricter data localization requirements.

What is the Significance of Data Centres in India's Economic Growth?

- **Data Processing for Digital Economy:** Data centres are vital for **cloud services, data analytics, artificial intelligence (AI), and machine learning (ML)** offering the computational capacity for processing vast data.

- **Enabling Digital Services:** Data centres are the **backbone of digital services** such as **e-commerce, social media, banking, entertainment, and communication**. They ensure the smooth delivery of online services to billions of users worldwide.
 - Major cloud providers like **Amazon Web Services (AWS), Microsoft Azure, and Google Cloud** rely on data centres to offer scalable and reliable services to global businesses and consumers.
- **Supporting Critical Infrastructure:** In sectors like **healthcare, finance, and government**, data centres host critical systems that support **national security, emergency services, and financial transactions**.
- **Boosting Economic Growth:** The expansion of data centres contributes to **job creation, infrastructure development, and the growth of the digital economy**. The sector also attracts investments in technology, power infrastructure, and real estate.
 - As per Crisil Ratings, India's **data centre capacity is expected to double by FY27**, creating significant investment opportunities and potentially generating over Rs 50,000 crore in economic activity.
- **Reducing Latency with Edge Computing:** The rise of **IoT and real-time applications** has increased the demand for **edge data centres**, which minimize latency by processing data closer to users.
 - The **rollout of 5G** is expected to further boost this trend, enhancing application speed and reliability.

What are the Key Challenges Hindering the Growth of India's Data Centre Sector?

- **Infrastructure Constraints:** Infrastructure deficits, including **unreliable power supply and limited connectivity, increase costs and risks for data centres**, especially in non-metro areas. High capital investment such as in cooling systems, particularly for smaller businesses, hampers growth.
 - Although relatively cost-effective compared to countries like Japan and Singapore, **substantial investment (Rs 55,000-65,000 crore) is needed for land acquisition, building construction, and power equipment over the 3 three years**.

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Note:

- Also, meeting **stringent regulations and safeguarding sensitive data** require constant investment in advanced security systems, adding to operational costs.
- **Regional Disparities:** Large metros like Mumbai dominate the market, while smaller cities lack adequate investments in infrastructure and power supply, leading to an **uneven distribution of data centres** across the country.
- **Environmental Sustainability:** Data centres are **energy-intensive**, contributing to **carbon emissions**. The industry faces pressure to adopt **renewable energy sources** and energy-efficient technologies to minimize environmental impacts.
- **Skill Shortages and Competition:** A lack of skilled professionals in data centre management and operations hampers sectoral growth.
 - Countries like **China**, with advanced data centre capacity, present significant competition.
- **Cybersecurity Threats:** As data centres handle vast amounts of sensitive information, they are **prime targets for cyberattacks**. Robust cybersecurity measures are essential to safeguard personal and corporate data.

- **Scalability:** As demand grows, scaling infrastructure to meet requirements while maintaining efficiency and cost-effectiveness remains a challenge.

Initiatives to Promote the Data Centre Ecosystem in India

- **Digital India (2015):** **Digital India scheme** aimed at **enhancing online infrastructure and internet connectivity**, fostering the growth of digital services across the country.
- **National Informatics Centre (NIC):** **NIC** established advanced **National Data Centres** to support government initiatives and digital infrastructure.
- **Infrastructure Status for Data Centres:** The government has granted **infrastructure status to data centres** with an **IT load of more than 5 MW**, facilitating easier access to financing and incentives.
- **State-Level Policies:** Policies like **Maharashtra's IT and ITES Policy 2023** offer targeted benefits and incentives to the data centre industry, promoting regional development.
- **Hyperscale Data Centres:** India's **first hyperscale data centre, Yotta D1**, has been set up in Greater Noida, Uttar Pradesh, marking a significant milestone in India's data centre capacity.



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Note:

Environment and Ecology

Highlights

- Tribal Ministry's Directive on Forest Right Act, 2006
- Golden Langur
- Tranquilising Wild Animals
- Brazilian Velvet Ant
- CGWB Report on Groundwater Contamination
- IPBES Transformative Change Assessment

Tribal Ministry's Directive on Forest Right Act, 2006

Why in News?

The **Ministry of Tribal Affairs** has directed states to establish **Institutional Mechanisms** to ensure compliance with the **Forest Rights Act (FRA), 2006**, in **tiger reserves**.

What are the Key Highlights of the Recent Directive By Tribal Ministry?

- **Ensure FRA Compliance:** The Ministry emphasized that **forest-dwelling communities** cannot be evicted without **legal recognition** of their rights under the **FRA and Wildlife Protection Act, 1972**.
 - This move follows complaints of unlawful evictions from **forest-dwelling communities**, particularly in **Madhya Pradesh, Maharashtra, and West Bengal**.
- **Consent for Relocation:** **Section 4(2)** of the FRA provides safeguards that make it imperative to **obtain free, informed consent of Gram Sabhas in writing for relocation**. The law also provides for settlement rights in the areas where the settlement is proposed.
 - States must submit a **report detailing tribal villages in tiger reserves**, and the status of their forest rights claims.
 - **The National Tiger Conservation Authority (NTCA)** has also sought timelines for **relocating 591 villages** in tiger reserves, intensifying debates over **balancing conservation with community rights**.
- **Grievance Redressal Mechanism:** States are instructed to set up grievance redressal systems to handle complaints and grievances related to eviction from forest areas.

What is the Forest Rights Act (FRA), 2006?

- **About:** It was enacted to **officially recognize and grant forest rights** and tenure to forest-dwelling **Scheduled Tribes (STs)** and **Other Traditional Forest Dwellers (OTFDs)** who have lived in these forests for generations without formal documentation of their rights.
- **Aim:** It seeks to correct **historical injustices** faced by these communities due to **colonial and post-colonial** forest management policies that overlooked their deep, **sympiotic relationship** with the land.
 - To empower these communities by enabling sustainable access to land and utilization of forest resources, **promoting biodiversity and ecological balance**, and protecting them from illegal evictions and displacement.
- **Provision:**
 - **Ownership Rights:** Grants ownership over **Minor Forest Produce (MFP)**. Allows collection, use, and disposal of forest produce.
 - **MFP** refers to **all non-timber forest products** of plant origin, including bamboo, brushwood, stumps, and canes.
 - **Community Rights:** Includes traditional usage rights such as **Nistar** (a type of Community Forest Resource).
 - **Habitat Rights:** Protects the rights of **primitive tribal groups** and pre-agricultural communities to their traditional habitats.
 - **Community Forest Resource (CFR):** Enables communities to protect, regenerate, and sustainably manage forest resources they have traditionally conserved.

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Note:

- The Act facilitates the **diversion of forest land** for public welfare projects managed by the government, subject to **Gram Sabha approval**.

What are the Challenges in the Implementation of the Forest Rights Act, 2006?

- **Lack of Recognition of Individual Rights:** The recognition of individual rights under the FRA **faces resistance from the Forest Department**, which perceives it as a challenge to their control over forest resources.
 - In **Assam**, shifting cultivation practices complicate the rights recognition process, while in **Maharashtra's Gadchiroli district**, community forest lands face threats of diversion for non-forest purposes despite progress in recognizing rights, revealing implementation gaps.
- **Technological Issues:** The implementation of digital platforms like **VanMitra** faces significant barriers due to **poor internet connectivity and low literacy rates** in tribal areas, making it harder to facilitate smooth processing of claims.
- **Conflicting Legislations:** The FRA often clashes with laws like the **Indian Forest Act, 1927** and **Wildlife Protection Act, 1972**. These conflicts create ambiguities, with officials prioritizing traditional forest governance over FRA mandates.
- **High Rejection Rates:** Many claims are rejected due to a **lack of proper documentation or evidence**, often without clear explanations or opportunities for appeal. This leaves legitimate claimants without recourse.
- **Underperforming Gram Sabhas:** The Gram Sabha often lacks the capacity, resources, and training to perform its responsibilities effectively.
 - Local elites within forest-dwelling communities often dominate decision-making processes, monopolizing the benefits and leaving marginalized groups without access to rights.
- **Eviction and Development Conflicts:** Despite FRA provisions, large-scale development projects like mining, dams, and highways often result in the eviction of forest-dwelling communities.

Golden Langur

Why in News?

A **Golden Langur** was killed in an accident on National Highway 117 in Assam, raising concerns over the increasing threats to this endangered species.



What are the Key Facts About Golden Langur?

- **Taxonomy and Discovery:**
 - **Species Name:** *Trachypithecus geei*.
 - **Family:** *Cercopithecidae* (Old World Monkeys).
 - **Subfamily:** *Colobinae* (Leaf-eating monkeys).
 - **Discovered By:** E.P. Gee in 1953; formally described by Khajuria in 1956.
- **Geographic Range:** Golden langurs are found exclusively in Assam, India, and neighboring Bhutan.
 - They inhabit a restricted area bordered by the **foothills of Bhutan (north)**, the **Manas River (east)**, the **Sankosh River (west)**, and the **Brahmaputra River (south)**.
- **Habitat:** Subtropical and temperate broadleaf forests at elevations from near sea level to above 3,000 meters.
- **Physical Characteristics:**
 - **Color:** **Golden-orange fur**. Coat color changes with seasons (cream in summer, dark golden in winter).
 - **Facial Features:** Black hairless face with a pale beard; protective hair whorl on the crown.
 - **Sexual Dimorphism:** Males are larger and more robust than females.

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Note:

- **Behavior:** Active during the day (**Diurnal**) and primarily live in trees (**Arboreal**).
 - Golden Langurs live in **troops** of 3 to 15 individuals, typically a **single male with multiple females** or occasionally all-male groups.
- **Geographic Variation:** The golden langur is thought to have two subspecies based on **coat color differences**, they are *Trachypithecus geei bhutanensis* (**northern Bhutan**) and *Trachypithecus geei geei* (southern Bhutan and India).
 - However, the northern subspecies has not been formally described according to the **International Code of Zoological Nomenclature (ICZN)**.
- **Threats:** Fragmented habitats are a major threat to golden langurs, as their population is split into isolated groups.
 - The absence of **non-breeding all-male bands** in these fragmented areas is a concern, as it could affect the species' long-term survival.
 - Human activities like road construction, deforestation, and conflicts between people and wildlife are causing this habitat fragmentation.
- **Conservation Status:** The **IUCN Red List** lists the golden langur as **Endangered**, and it is protected under **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)** Appendix I.
 - The **Wildlife Protection Act of 1972 (now the Wildlife Protection (Amendment) Act 2022)** lists the Golden Langur in **Schedule I**, ensuring highest stringent protection measures.
- **Conservation Measures:** Create corridors to **connect fragmented habitats**, improving genetic diversity and movement between populations.
 - **Building canopy bridges** for safer movement. Long-term conservation strategies are needed to address human impacts on the golden langur's habitat.

Tranquilising Wild Animals

Why in News?

Recently, a three-year-old tigress, Zeenat, was tranquilised and captured from the forests of **Bankura** in West Bengal and relocated to **Odisha's Simlipal tiger reserve**.

- **Tranquilization is not only vital for conservation efforts** but also for ensuring the safety of both the animals and human populations.

What is Wildlife Tranquillisation?

- **About:**
 - Wildlife tranquillisation is the process of **sedating wild animals using specific sedative drugs** to safely capture, handle, or relocate them for various conservation, research, or rescue purposes.
- **Regulation:**
 - The use of tranquilizers is regulated under the **Drugs and Cosmetics Act, 1940**.
 - In India, **animal tranquilization is overseen by State Forest Departments** under the **Wildlife Protection Act, 1972**, with support from trained veterinarians and expertise provided by the **Wildlife Institute of India (WII)**.
- **Methods and Tools:**
 - **Tranquilliser Guns and Darts:** The primary tool for wildlife tranquillisation is a **dart gun**, which delivers a **syringe filled with sedative drugs**.
 - The dart is **shot remotely from a distance**, typically using compressed CO₂ gas to propel the dart.
 - The dart is often equipped with a **hypodermic needle** and a **barb** to ensure that the drug is effectively administered under the skin.
 - A **tuft of feathers or other stabilising materials** is attached to the dart to improve accuracy during flight.
- **Types of Drugs:**
 - **Opioids:** Drugs such as **M99 (etorphine)** used for immobilising large mammals like elephants and tigers.
 - In wildlife tranquillisation, **morphine** can sometimes be used in combination with other drugs for immobilisation.
 - **Alpha-Adrenergic Tranquilisers:** Drugs like **Xylazine** and **Ketamine** are commonly used in combination for sedating animals like deer and tigers.
 - **Xylazine** acts as a sedative and muscle relaxant, while **Ketamine** helps to induce dissociation and extend the period of immobility.

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Note:

- These drugs allow for more controlled sedations, with the capacity to reverse the effects using antidotes.
- **Reversal Agents:** Specific antidotes, such as **Naloxone**, are used to reverse the effects of tranquillisation.
- **Applications:**
 - **Conservation and Relocation:** Used to safely relocate animals from human-wildlife conflict

zones or move endangered species to protected reserves.

- **Research and Monitoring:** Employed for **capturing animals for health** assessments, tagging, and studying migration patterns.
- **Rescue Operations:** Essential for **rescuing injured or stranded animals**, enabling veterinary care or transport to rehabilitation centers.

WILDLIFE CONSERVATION INITIATIVES

Constitutional Provisions for Wildlife

42nd Amendment

Act, 1976: Forests & Protection of Wild Animals and Birds (moved from State to Concurrent List)

Article

48 A: State shall endeavor to protect & improve environment and safeguard forests and wildlife of country

Article

51 A (g): Fundamental duty to protect & improve natural environment including forests and Wildlife

Legal Frameworks

Wildlife (Protection) Act, 1972

Biological Diversity Act, 2002

Wildlife Crime Control Bureau (WCCB):

Collection, collation of intelligence & its dissemination, establishment of centralized Wild Life crime databank, coordination etc.

Wildlife Crime Control:

- ④ Operation Save Kurma
- ④ Operation Thunderbird

Species-Specific Initiatives

- Protection and conservation of Greater Adjutant in Gangetic riverine tract
- Dolphin Conservation in Non-Protected Area Segment of Ganga River
- Conservation Breeding Centre for Wild water buffalo (2020)
- Recovery programme for Snow leopard (2009)
- Recovery programme for Vultures (2006)
- Project Elephant (1992)
- Project Tiger/National Tiger Conservation Authority (NTCA) (1973)

Major Conservation Initiatives

Integrated Development of Wildlife Habitats (IDWH):

- ④ Financial assistance provided to State/UT Governments for protection and conservation of wildlife
- ④ A Centrally Sponsored Scheme

National Wildlife Action Plan (2017-2031)

Guidelines for Eco-tourism in Protected Areas

Human-Wildlife Conflict Mitigation

Wildlife Crime Control Bureau: To combat wildlife-related crimes

Wildlife Division (MoEFCC):

- ④ Policy and law for conservation of biodiversity and Protected Area network
- ④ Technical and financial support to the State/ UTs under IDWH, Central Zoo Authority and Wildlife Institute of India

India's Collaboration with Global Wildlife Conservation Efforts

- ④ Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- ④ Convention on the Conservation of Migratory Species of Wild Animals (CMS)
- ④ Convention on Biological Diversity (CBD)
- ④ World Heritage Convention
- ④ Ramsar Convention
- ④ The Wildlife Trade Monitoring Network (TRAFFIC)
- ④ United Nations Forum on Forests (UNFF)
- ④ International Whaling Commission (IWC)
- ④ International Union for Conservation of Nature (IUCN)
- ④ Global Tiger Forum (GTF)



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Note:

India's Efforts for Wildlife Conservation

- **Constitutional Provisions for Wildlife:**
 - The **42nd Amendment Act**, 1976, Forests and Protection of Wild Animals and Birds was transferred from **State to Concurrent List**.
 - **Article 51 A (g)** states that it shall be the **duty** of every citizen to have compassion for living creatures.
 - **Article 48A** mandates that the State shall endeavor to protect and improve the environment and to safeguard the **forests and wildlife of the country**.
- **Legal Framework:**
 - **Wildlife (Protection) Act, 1972**
 - **Environment Protection Act, 1986**
 - **The Biological Diversity Act, 2002**
- **International Collaboration:**
- **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)**
- **Convention on the Conservation of Migratory Species of Wild Animals (CMS)**
- **Convention on Biological Diversity (CBD)**
- **The Wildlife Trade Monitoring Network (TRAFFIC)**
- **International Union for Conservation of Nature (IUCN)**
- **Global Tiger Forum (GTF)**

Brazilian Velvet Ant

Why in News?

A study in the *Beilstein Journal of Nanotechnology* revealed that the **Brazilian velvet ant** (*Traumatotilla bifurca*) has “ultrablack” body parts.

- These parts absorb over 99.5% of visible light, making them nearly invisible. The discovery highlights unique **biological nanostructures** with potential applications in technology.

What are the Key Facts

About Brazilian Velvet Ant?

- **Taxonomy:** Velvet ants are not “ants,” they are a species of **wasp** from the family **Mutillidae**.
 - Velvet belongs to the **Hymenoptera order**, which also includes **bees and other wasps**.

- Some species, such as **Traumatotilla bifurca** (**Brazilian velvet ant**), display **distinct black and white markings**, making them visually striking in **tropical savanna and dry shrub deserts**.
- **Ultrablack Property:** Female velvet ants display an ultrablack color which was first observed in *Traumatotilla bifurca*, which absorbs nearly all visible light.
 - The unique color comes from **special microstructures in the exoskeleton** that trap light. Ultrablack pigmentation helps with **camouflage, temperature control, and attracting mates**.
- **Males vs. Females:** Only female velvet ants display **ultrablack coloration**, while males have similar black markings but reflect more light.
- **Role in Ecosystem:** Serves as a pollinator and contributes to maintaining ecological balance.
- **Evolutionary Significance:** The ultrablack property highlights convergent evolution, where unrelated species develop similar traits.
 - This adaptation is also observed in **birds-of-paradise** and **deep-sea fish**, aiding in camouflage and survival.
- **Potential Scientific Applications:** The ultrablack property reveals insights into nanostructures and inspires advancements in **stealth technology** and **solar panel efficiency**.



Note:

- Ants, though small in size, have colonized nearly **every landmass on Earth**. Their total biomass is expected to surpass that of birds and mammals combined.
 - **Biomass, in ecological context**, refers to the **total mass of living organisms, including plants and animals**, within a given area or volume of a habitat.

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Note:

- Ants are **eusocial insects** with highly **organized colonies** that demonstrate significant cooperation and division of labor.
- According to the **World Economic Forum**, Ants use **feedback (responses to actions)** to regulate **foraging** (searching for food), conserving energy and resources. This **principle of minimizing waste** can enhance efficiency in systems like energy use or data management.
 - Additionally, Ants operate without **central control**, proving that complex tasks can be managed through simple interactions.
- A study published in **Proceedings of the National Academy of Sciences** demonstrated that ants, particularly **longhorn crazy ants (Paratrechina longicornis)** excel in collective problem-solving by coordinating efforts without verbal communication.
 - According to the study **Ants outperformed humans** in an experiment involving carrying a **T-shaped object** through obstacles.

CGWB Report on Groundwater Contamination

Why in News?

The **Central Groundwater Board (CGWB)** report reveals a troubling rise in groundwater contamination across India, with more districts showing excessive nitrate levels.

- This chemical contaminant poses significant health risks, particularly to **young children**, while also raising environmental concerns.

What are the Key Findings of the CGWB Report?

- **Increase in Nitrate Contamination:** As of 2023, **440 districts** reported excessive nitrate levels in groundwater, up from **359 districts** in 2017.
 - **56%** of India's districts have nitrate concentrations exceeding the safe limit of **45 mg per litre**.
- **Regional Hotspots:** **Rajasthan** (49%), **Karnataka** (48%), and **Tamil Nadu** (37%) reported the highest levels of nitrate contamination.

- **Maharashtra, Telangana, Andhra Pradesh, and Madhya Pradesh** are showing notable levels of nitrate contamination, with growing concerns in central and southern India.
- **Monsoon Impact:** **Nitrate contamination** increases after the monsoon, with **32.66%** of samples exceeding safe limits during the rainy season, compared to **30.77%** pre-monsoon.
- **Other Groundwater Contaminants:** **Fluoride contamination** remains a major issue in **Rajasthan, Haryana, Karnataka, Andhra Pradesh, and Telangana**.
 - **Uranium contamination** exceeds safe levels in **Rajasthan, Punjab, Haryana, Gujarat, Tamil Nadu, Andhra Pradesh, and Karnataka**, particularly in over-exploited groundwater zones.
- **Groundwater Extraction:** **60.4%** of groundwater is being extracted across India, maintaining a steady rate since 2009.
 - However, there has been an improvement in the **availability of groundwater**, with **73% of the blocks** classified as being in the 'safe' zone, a significant increase from 67.4% in 2022.

Central Ground Water Board (CGWB)

- **About:** The CGWB, established under the Ministry of Water Resources (now **Ministry of Jal Shakti**), is the apex body for **managing, exploring, monitoring, assessing, and regulating groundwater resources** in India.
 - Established in **1970**, CGWB was initially formed by renaming the **Exploratory Tube Wells Organization** and was later merged with the **Ground Water Wing of the Geological Survey of India** in 1972.
 - The **Central Ground Water Authority (CGWA)**, constituted under the **Environmental Protection Act, 1986**, regulates groundwater development to ensure its sustainability.
- **Key Functions and Responsibilities:** CGWB provides scientific expertise for groundwater management, including exploration, monitoring, and water quality assessments.
 - It also implements schemes for **artificial recharge and rainwater harvesting** to augment groundwater levels.

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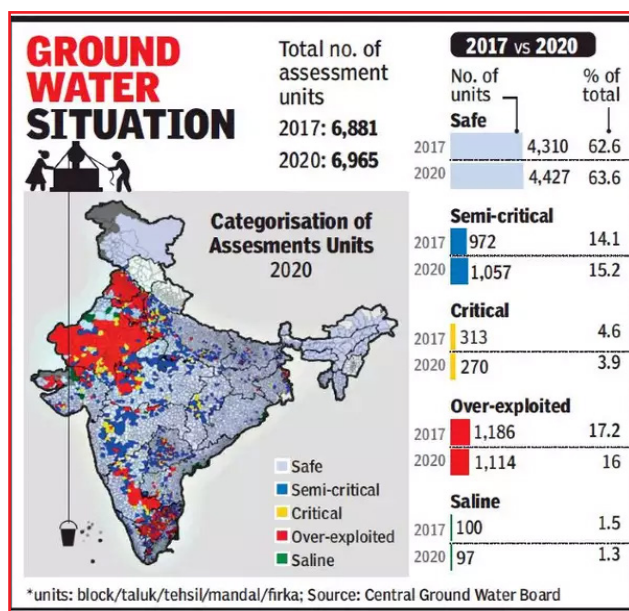


Note:

- **Scientific Reports:** CGWB releases State and District hydrogeological reports, ground water year books and Atlases.

What are the Sources of Groundwater Contamination?

- **Agricultural Practices:** Excessive use of **fertilizers and pesticides** in agriculture leads to **nitrate and phosphate** leaching into the soil, contaminating groundwater.
 - Improper **irrigation and over-extraction of water** further exacerbate the issue.
- **Storage Tanks:** Corroding tanks may leak **gasoline, oil, or chemicals** into the groundwater.
- **Hazardous Waste Sites:** Abandoned sites with leaking materials pose risks to groundwater.
- **Landfills:** Contaminants from landfills can seep into groundwater if protective layers are damaged.
- **Septic Systems:** Poorly maintained systems can leak waste and chemicals, polluting groundwater.
- **Atmospheric Contaminants:** Contaminants from the atmosphere or surface water can eventually reach groundwater.
- **Deforestation:** Disrupts **natural filtration processes in the soil**, leading to increased **runoff** and the entry of pollutants into groundwater systems.



What are the Implications of Groundwater Contamination?

- **Health Risks:** Contaminants such as **fluoride, nitrates, and heavy metals** pose serious health risks and lead to **Waterborne Diseases**.
 - Excessive **nitrate contamination**, particularly for infants and young children, can cause **methemoglobinemia**, also known as **"blue baby syndrome."**
- **Food Production:** Groundwater contamination with heavy metals and pollutants used for irrigation can lead to toxic substances **accumulating in crops, compromising food safety and human health**.
- **Environmental Impact:** Nitrate pollution can disrupt local ecosystems, impacting plant and aquatic life.
 - Contaminants in groundwater can cause **soil contamination and salinization**.
- **Increased Costs:** Contaminated groundwater requires **costly treatment processes** to make it safe for consumption.
 - Groundwater contamination can spread to **surface water**, worsening water quality. **Chronic contamination reduces freshwater availability**, leading to water shortages and potential socio economic crises.

What are the Measures Taken to Curtail Groundwater Contamination?

- **Jal Shakti Abhiyan (JSA).**
- **National Aquifer Mapping and Management Program (NAQUIM).**
- **Atal Bhujal Yojana (ABHY).**
- **Pollution Control Programs:** **Central Pollution Control Board's (CPCB) and State Pollution Control Boards** enforce pollution control measures under the **Water (Prevention & Control) Act, 1974**, focusing on the prevention of contamination.
 - Installation of **Sewage Treatment Plants (STPs)** and **Effluent Treatment Plants (ETPs)** to treat water before release into the environment.
- **Public Awareness Campaigns:** Training stakeholders through institutions like the **Rajiv Gandhi National Ground Water Training & Research Institute (RGNGT&RI).**

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- Efforts like **"Catch the Rain"** and **Swachh Bharat Mission** educate communities about groundwater protection.

IPBES Transformative Change Assessment

Why in News?

A report released by the **Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)** titled **Transformative Change Assessment**, stresses the critical role that governance plays in mitigating biodiversity loss.

- It highlights how effective governance, with its focus on inclusivity and sustainability, is essential for preserving **biodiversity and driving long-term, systemic change**.

What are the Key Highlights of the Transformative Change Report?

- **Prevent Ecological Damage:** The report highlights the urgent need for fundamental shifts in **how societies interact with nature to prevent biodiversity loss**, warning that inaction could lead to **irreversible ecological damage**, including the loss of coral reefs and rainforests.
- **Economic and Employment Opportunities:** Immediate action could generate **USD 10 trillion in business opportunities** and support **395 million jobs globally by 2030**, especially in industries that depend heavily on nature.
- **Causes of Biodiversity Loss:** The report identifies the root causes as the **disconnection between people and nature**, domination over nature and others.
 - Other causes include the **concentration of power and wealth**, and prioritizing **short-term material gains over long-term sustainability**.
- **Five Key Strategies for Transformation:**
 - **Conserve and Regenerate:** Focus on areas of **biocultural diversity** that combine **environmental restoration with cultural values**, such as **community-driven forest management** in Nepal.

- **Systematic Change in Key Sectors:** Address sectors like **agriculture, fisheries, and infrastructure** that contribute to biodiversity loss through sustainable practices.
- **Transform Economic Systems:** Shift toward **nature-positive economies** by reforming **harmful subsidies** and promoting **sustainable business models**.
- **Adaptive Governance:** Build Adaptive governance systems that integrate diverse actors, including **Indigenous communities**, and make biodiversity a central concern in policies.
 - Adaptive governance enables **continuous adjustment of strategies** based on changing environmental conditions and new information.
 - This flexibility is crucial for addressing complex biodiversity challenges and remaining responsive to emerging threats.
- **Shift Views and Values:** Promote the recognition of **human-nature interconnectedness**, with an emphasis on education, experiential activities, and integrating diverse knowledge systems.

IPBES

- IPBES, established in 2012, is an **independent intergovernmental body** with nearly 150 member governments including India.
 - It provides scientific assessments on biodiversity, ecosystems, and their contributions to people, along with tools and methods for their protection and sustainable use.
- It is not a **United Nations body**. However, the **United Nations Environment Programme (UNEP)** provides secretariat services to IPBES.
- **Secretariat:** Bonn, Germany.

What is Transformative Change and How Can it be Achieved?

- **Transformative Change:** It is a **fundamental, system-wide reorganization** across technological, economic, and social factors, including paradigms, goals, and values, necessary for the **conservation and sustainable use of biodiversity**, and achieving a **good quality of life and sustainable development**.

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Note:

➤ **Steps to Achieve Transformative Change:**

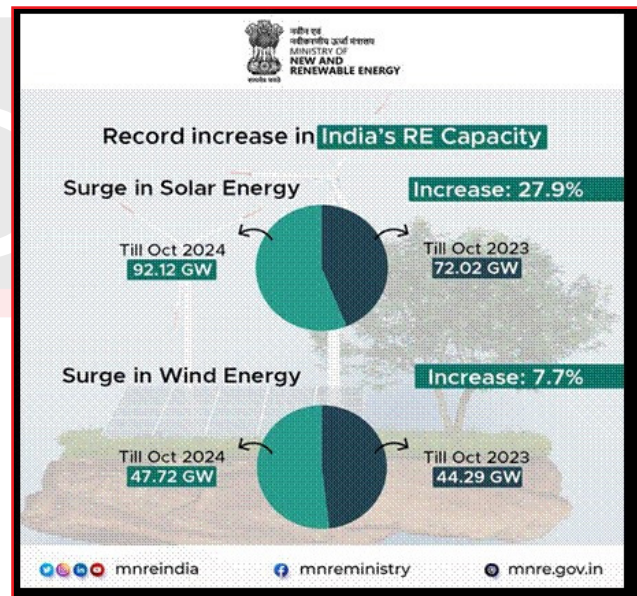
- **Carbon-Neutral Actions:** Strive for **carbon-neutrality**, making it a norm for individuals, businesses, and governments, while supporting legitimate climate-friendly offsets.
- **Earth-Positive Choices:** Make it easy, enjoyable, and affordable for people to contribute **positively to the environment** by shifting supply chains and influencing policies.
- **Reforming Subsidies:** Redirect **subsidies and incentives to support environmental stewardship** and facilitate transitions away from resource-extractive industries to sustainable practices.
- **Precautionary Decision-Making:** Implement precautionary, adaptive, inclusive, and cross-sector decision-making, addressing environmental threats proactively, **even without definitive proof**.
- **Strengthening Environmental Laws:** Advocate for **stronger environmental laws**, ensuring consistent enforcement, and supporting global initiatives that protect nature and promote sustainable economic activities.

What are India's Initiatives for Transformative Change?

- **National Biodiversity Action Plan (NBAP).**
- **Swachh Bharat Abhiyan.**
- **National Action Plan on Climate Change.**
- **Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME).**
- **Pradhan Mantri Ujjwala Yojana (PMUY).**
- **Mission LiFE (Lifestyle for Environment).**

➤ **Atal Mission for Rejuvenation and Urban Transformation (AMRUT).**

- **SDGs for Transformative Change:** The **Sustainable Development Goals (SDGs)** for transformative change focus on sustainable development through inclusive growth, addressing **Life Below Water, Climate Action, Clean Energy, Clean Water, Responsible Consumption, and Life on Land.**
- India's initiatives like the **Smart Cities Mission, Green India Mission, Swachh Bharat Abhiyan, Pradhan Mantri Ujjwala Yojana, and National Clean Energy Fund** align with various SDGs.
- India has made **substantial investments in renewable energy**, aiming to generate **500 GW from non-fossil sources by 2030**, under the leadership of the **International Solar Alliance.**



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Note:

History

Highlights

- Iran's Capital Shift to Makran and Alexander's Legacy
- Deciphering the Indus Valley Script
- Disintegration of the Soviet Union
- Muslim League and Rise of Communal Politics in India

Iran's Capital Shift to Makran and Alexander's Legacy

Why in News?

Iran plans to **relocate** its capital from **Tehran** to the southern **Makran coastal region** due to economic and ecological concerns.

- In ancient times, **Makran** was notable as the region where **Alexander the Great** lost a third of his men while **retreating** to **Macedonia**, after his **Invasion of India (327–325 BCE)**.

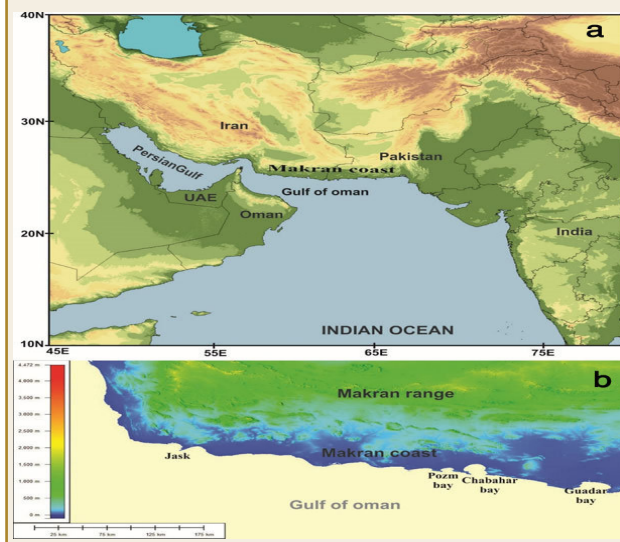
What are Key Facts Regarding Iran's Plan to Relocate its Capital?

- **Historical Context:** Tehran has been Iran's capital for **over 200 years**, having been established during the reign of **Agha Mohammad Khan**, the first ruler of the **Qajar dynasty (1794 to 1925)** of Iran.
- **Planned Relocation:** Iran intends to **move its capital** from Tehran to Makran in **Sistan and Baluchestan Province** due to Tehran's **overpopulation, pollution, water scarcity, and energy shortages**.
 - The idea of relocating the capital was **first proposed** during **Mahmoud Ahmadinejad's** presidency in the **early 2000s**.
- **Makran's Strategic Importance:** Makran's strategic location near the **Gulf of Oman** presents opportunities to boost the **maritime economy** and enhance **national economic prospects**.

- Makran coast is a major source of **Iran's petroleum reserve** and **coastal trade** due to the presence of ports like **Chabahar**.
- With over **1,000 kilometers of coastline** and the **Chabahar Free Trade Zone** developed since **2003**, Iran aims to transform Makran into an **international trade corridor** linking **Central Asia to the Indian Ocean**.

Makran

- Makran is part of the **plateau of Balochistan**, which is shared between **Pakistan and Iran**.
- It is a **semi-desert** coastal strip of land, bounded by the **Arabian Sea** and **Gulf of Oman**.
- The Makran coast hosts the **Pakistani port of Gwadar** and the **Iranian port of Chabahar**, serving as gateways to the **Strait of Hormuz** and the **Persian Gulf**.
 - The Strait of Hormuz is a **'choke point'**, through which much of the world's oil supply passes and is thus **strategically important**.



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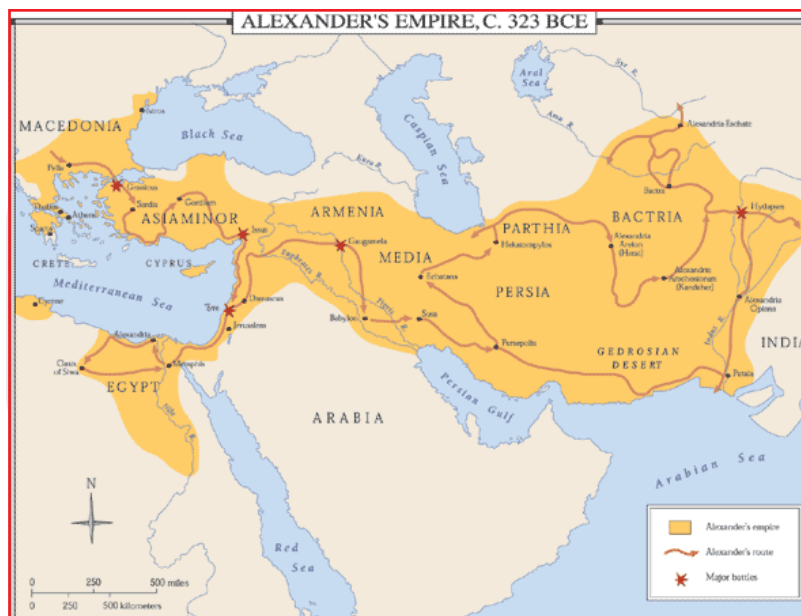
Note:

What are Key Facts Regarding Alexander's Indian Invasion?

- **About Alexander:** Alexander the Great was king of Macedonia (336 BC to 323 BC) and conquered a huge empire that stretched from the Balkans to modern-day Pakistan.
 - He remained **undefeated in battle** and is regarded as **one of history's greatest military commanders**.
- **Political Landscape of India:** North-western India was divided into **monarchies and tribal republics** in contrast to **eastern India** which was **united** during rule of **Dhanananda in Magadh**, aiding Alexander's conquest.
 - Rulers like **Ambhi of Taxila** and **Porus** from the North-west region failed to unite against Alexander.
 - **Ambhi** of Taxila **surrendered** to Alexander, offering troops and resources to bolster his army.
- **Entry through Khyber Pass:** Alexander entered India via the **Khyber Pass** after conquering **Kabul**, reaching the **Indus River**.
- **Key Events:**
 - **Battle of the Hydaspes:** Alexander faced strong resistance from **Porus** at the Jhelum River. After defeating him, Alexander admired his bravery, **restored his kingdom, and made him an ally**.
 - **Halting at the Hyphasis (Beas) River:** Alexander's army, exhausted and fearing a **larger Indian force led by Nandas**, refused to advance into the Gangetic Plain and persuaded him to retreat.
- **Forced Retreat:** The Greek historian **Arrian** in his account "*The Anabasis of Alexander*" described the march

through the **Gedrosia (Makran Desert)** desert as one of extreme suffering.

- Alexander led part of his army back to Persia through the harsh Gedrosian (Makran) Desert, aiming to **surpass Cyrus the Great, who had failed to cross it**.
 - **Cyrus the Great (590-529 BC)**, also known as **Cyrus II**, was a **Persian King** who united all the **Iranian tribes**.
- A large portion of Alexander's army **died from dehydration, exhaustion, and starvation**, with soldiers killing their horses and mules for food.
- Out of the estimated **1,20,000 infantry and 15,000 cavalry** Alexander took to India, only one-fourth survived the return journey.



What were the Effects of Alexander's Invasion?

- **Direct Contact:** Alexander's invasion was the **first major encounter** between **ancient Europe and India (South Asia)**, laying the groundwork for **cultural, geographical, and trade exchanges** between India and Greece.
 - It opened **four key land and sea routes (three by land and one by sea)**, allowing Greek merchants and craftsmen to trade and settle in the region, strengthening **commercial ties**.
- **Greek Settlements in India:** The invasion led to the establishment of key **Greek cities** in the region, such as **Alexandria** in the Kabul region, and **Boukephala** on the Jhelum river.
- **Geographical Exploration:** Alexander's fleet, led by **Nearchus**, explored the coast from the mouth of the **Indus to the Euphrates river** in the

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Note:

Middle East and provided **historical records** that helped establish **Indian chronology for later events**.

- **Social and Economic Insights:** Alexander's historians provided details on practices like the **sati system**, the **sale of girls** in marketplaces by poor parents, and the **fine breed of oxen** in north-west India.
 - Notably, **200,000 oxen were sent to Macedonia** for use in Greece.
- **Mauryan Expansion:** Alexander's **defeat of petty states** in north-west India paved the way for the **Mauryan Empire's** expansion in the region.
 - **Chandragupta Maurya**, inspired by Alexander's tactics, used the knowledge gained to **overthrow the Nanda dynasty** and found the **Mauryan Empire**.
- **Greek Influence:** Greek culture, including **art, architecture, and philosophy**, influenced Indian society which later incorporated into **Gandhara School of Art**.
 - Gandhara art represented a unique synthesis of **Indian, Greek, and Roman artistic traditions**.

Deciphering the Indus Valley Script

Why in News?

Recently, Tamil Nadu's Chief Minister, MK Stalin announced a USD 1 million prize for anyone who can successfully **decipher the Harappan (Indus Valley) script of the Indus Valley Civilisation**.





- It has reignited the century-old mystery of the **Harappan script**, which has eluded over 100 attempts by scholars to decode its meaning.

Note: Deciphering refers to the process of translating unknown symbols or scripts into a readable language.

What is the Indus Valley Script?

- **About:** The Indus Valley Script, used by the **Indus Valley Civilization (2600–1900 BCE)** in present-day Pakistan and north-western India, remains undeciphered.
 - The script was discovered in the 1920s by **Sir John Marshall's team**. It appears on **seals, terracotta tablets, and metal**, featuring **pictograms** and **animal or human motifs**.

- **Writing Style:** Generally **written right to left**, longer texts sometimes used **Boustrophedon Style** (alternating directions between lines).
- **Brevity of Inscriptions:** Most inscriptions are **short**, averaging 5 characters, with the longest known text containing **26 symbols**.
 - The brevity has led to debates about whether it represents a full-fledged language or merely symbolic notations.
- **Nature of the Script:** Likely a **logosyllabic system**, combining pictograms and syllables, similar to other scripts of its era.
 - Scholars propose a **rebus principle**, where symbols represent sounds or ideas indirectly.
- **Purpose and Function:** The script may have been used for trade, tax records, and identification, but its full role remains unclear. Some symbols, resembling multiplication, addition, and the swastika, might also have educational or religious significance.
 - Some believe it was a marking system, not a language-based script.
- **Theories About Its Language:**
 - **Dravidian Hypothesis:** Supported by Asko Parpola and Indian researcher **Iravatham Mahadevan**.
 - Claims the script has **Dravidian roots**, with connections to Old Tamil.
 - **Example:** Parpola suggests the 'fish' symbol in the Indus script represents "**meen**," meaning both "**fish**" and "**star**" in Dravidian languages, aligning with Old Tamil terminology.
 - Some 'number + fish' sequences are believed to refer to star groups, though this remains unproven.

	SIGN	IDENTIFICATION	READING	MEANING
a		fish	<i>mīn</i>	1. fish 2. star
b		3 + fish	<i>mu(m) mīn</i>	three stars (Mrigasiras)
c		6 + fish	<i>caru mīn</i>	six stars (Pleiades)
d		7 + fish	<i>elu mīn</i>	seven stars (Ursa Major)

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Note:

- **Sanskrit Linkage:** Early scholars like S.R. Rao linked the script to **Sanskrit**, tying it to the **Vedic period (1500 - 600 BCE)**.
 - This theory has been contested due to the **timeline mismatch between the Harappan and Vedic cultures**.
- **Non-Linguistic Symbols:** Critics like Steve Farmer and Peggy Mohan argue the symbols were not a language but a system for **political, economic, or religious insignias**.

Note:

- **Script:** A system of writing using symbols or characters to represent the words of a language, such as Latin, Devanagari, or Indus script.
- **Language:** A system of communication involving sounds, words, and grammar to convey meaning, such as English, Hindi, or Tamil.

What are the Challenges in Decipherment of Indus Valley Script?

- **Lack of Bilingual Texts:** The decipherment of ancient scripts often depends on **bilingual texts**, like the Rosetta Stone, which provided a **Greek translation of Egyptian hieroglyphs**.
 - The Indus script, however, lacks such comparative inscriptions, making it difficult to link symbols to sounds or meanings.
 - The Rosetta Stone, discovered in 1799 near the **Nile** Delta, contains a message written in **Greek, Demotic, and hieroglyphs**. It helped scholars to decipher ancient **Egyptian hieroglyphs**.
- **Short and Fragmentary Texts:** Most inscriptions are brief, with an average of five characters per text.
 - The lack of long texts limits the ability to **analyze grammar, syntax, or patterns** typically used in linguistic decipherment.

- **Unknown Language:** The script likely represents a language with no surviving descendants, making comparisons challenging.
 - Theories suggest **Dravidian, Indo-Aryan**, or a lost language family, but none are conclusive.
- **Symbol Variations:** S.R. Rao (1982) proposed 62 signs in the script, but later Asko Parpola suggested 425 signs (1994).
 - In 2016, Bryan K. Wells proposed 676 signs, but the exact number and their meanings remain debated, leading to confusion.
- **Limited Archaeological Evidence:** The **limited corpus of 3,500 Harappan seals**, unexplored sites, and erosion of artifacts hinder comprehensive script analysis.
- **Technological Constraints:** While **Artificial Intelligence (AI)** and **machine learning** are being applied, current models struggle with **sparse datasets** like the Indus script. Identifying patterns in brief inscriptions remains a significant challenge.

What is the Significance of Deciphering the Indus Script?

- **Unlocking Harappan Language:** Identifying the language family (Dravidian, Indo-Aryan, or others) would offer insights into the linguistic roots of ancient India.
- **Understanding Harappan Culture:** Decipherment could uncover Harappan religious beliefs, societal norms, and sociopolitical structures, including administration and governance.
- **Historical Continuity:** Establishing connections between the Harappans and later civilizations could help trace India's cultural and linguistic evolution.
- **Global Relevance:** The script's study contributes to understanding ancient writing systems, **human communication evolution**, and **cross-cultural exchanges** with Mesopotamia and beyond.
 - Deciphering may reveal ties to Vedic practices and links to Dravidian or Indo-European languages.

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Note:

MAJOR CIVILISATIONS OF THE WORLD

MESOPOTAMIA, 4000-3500 BC

- Modern-day Iraq and parts of **Iran, Syria, Kuwait, and Turkey**, between **Tigris** and **Euphrates Rivers**
- Known as **Fertile Crescent/Cradle of civilization**
- Diverse collection of cultures bound by their script, gods, and views on women
- Highly esteemed education system** (law, medicine, and astrology, reflecting rich cultural and religious landscape)
- Both **men and women were involved in diverse occupations**
- Cities built around ziggurats**, step-pyramid temples, honoured their patron deity
- Cities, made of **sun-dried brick**, were the world's first

ANCIENT EGYPT, 3100 BC

- Set along fertile **Nile River**
- Most known for **pyramids, tombs, and mausoleums** practice of mummification to prepare corpses for afterlife
- Left legacy of monumental writing and mathematics systems
- Civilization **ended in 332 BC** with Alexander the Great's conquest

INDUS VALLEY CIVILISATION, 3300 BC

- Located in modern-day **India, Afghanistan, and Pakistan**
- Relatively peaceful compared to other ancient civilizations, with little evidence of widespread warfare
- Organised city planning**, complete with **uniform baked-brick homes**, a grid structure, and drainage, sewage, and water supply systems
- Declined around 1800 BC**, actual reasons behind demise still debated (theories propose Aryan invasion or climatic & natural factors for decline)

ANCIENT CHINA, 2000 BC

- Protected by the Himalayan Mountains, Pacific Ocean, and Gobi Desert, and **situated between Yellow and Yangtze rivers**
- Flourished in isolation from invaders and other foreigners for centuries
- Generally divided into four dynasties—**Xia, Shang, Zhou, and Qin** - ancient China was ruled by a succession of emperors
- Credited with developing the **decimal system, abacus, and sundial**, as well as **the printing press**
- Mobilised populations to build massive infrastructure projects (like Egyptians)



Disintegration of the Soviet Union

Why in News?

Recently, **25th December** marked the anniversary of the day when the Soviet flag was taken down from the **Kremlin** (Russian government's 'power centre'), marking the end of the **Soviet Union**.

- The **Soviet Union**, officially the **Union of Soviet Socialist Republics (USSR)** was a socialist federation from 1922 to 1991, consisting of multiple republics, governed by the **Communist Party**, with **Russia** as the dominant power.

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Note:



What Led to the Formation of the Soviet Union?

- **History (Tsarist Regime and Monarchy):** The Soviet Union's roots trace back to the Russian Revolution of 1917, which ended the Romanov dynasty's 300-year reign (1613-1917).
 - The **Tsar** wielded **absolute power** over governance, the military, and society.
 - Rising **inequality** and **economic hardship** triggered dissatisfaction, setting the stage for revolution.
- **February Revolution 1917:** Protests and strikes culminated in **Tsar Nicholas II's abdication**, ending the monarchy.
 - A **Provisional Government** replaced the Tsar but faced power struggles with the **Petrograd Soviet**, dominated by **socialist factions** like the **Bolsheviks** and **Mensheviks**.
- **October Revolution 1917:** **Lenin** and **Trotsky** led the **Bolsheviks** in the **October Revolution**, overthrowing the **Provisional Government** and declaring "**all power to the Soviets**."
 - This marked the establishment of **Soviet rule** and the start of communist policies like **nationalization**.
- **Russian Civil War 1918-1922:** The **Red Army** battled **anti-Bolshevik forces** (White Guards) during the civil war.
 - The **Bolsheviks** emerged victorious, consolidating power and paving the way for a unified state.
- **Formation of the USSR (30th December 1922):** The **Union of Soviet Socialist Republics (USSR)** was officially declared, becoming the world's first **communist state**.

- **Lenin's leadership** introduced **centralized economic planning** and communist governance.
- Soviet leadership evolved from **Lenin's** Bolshevik consolidation to **Stalin's** centralization, the Great Purge of 1936, and Soviet Union's victory over Nazi Germany, followed by **Khrushchev's** reforms, **Brezhnev's** stability, and **Gorbachev's** restructuring efforts.

- **World War II and Lithuania- 1940s:** The **Baltic states** (Estonia, Latvia, and Lithuania) were forcibly incorporated into the Soviet Union in **1940 (World War II)** following the **Molotov–Ribbentrop Pact**.

- These **Baltic states** had gained independence in 1918, after the collapse of the Russian Empire
- Post-war, the USSR emerged as a **superpower (Warsaw Pact)**, leading the **socialist bloc** and dominating **Cold War** geopolitics.

How did Various Challenges Lead to the Dissolution of the USSR?

- **Economic Stagnation:** By the 1970s, the **Soviet economy** lagged in productivity and technology, with overemphasis on military and satellite states draining resources.
 - Citizens faced **consumer shortages** and rising dissatisfaction, despite state subsidies ensuring a minimum standard of living.
- **Gorbachev's Reforms:** Policies of Gorbachev like **glasnost** (openness) and **perestroika** (restructuring) aimed at reform but inadvertently weakened the Communist Party's authority.
 - Multi-party elections in 1990 and reduced censorship fueled **nationalist movements** in republics like **Lithuania and Ukraine**.
- **Collapse due to Cold War Pressures:** The costly **arms race** with the US, the defeat in **Afghanistan**, and the **Berlin Wall's fall in 1989** undermined Soviet control.
 - The USSR's failure to compete with Western economic models magnified internal inefficiencies.
- **Nationalist Movements and Secession:** Under leaders like **Yeltsin**, Russian nationalism weakened central control, while the **Baltic states and Ukraine** sought independence.

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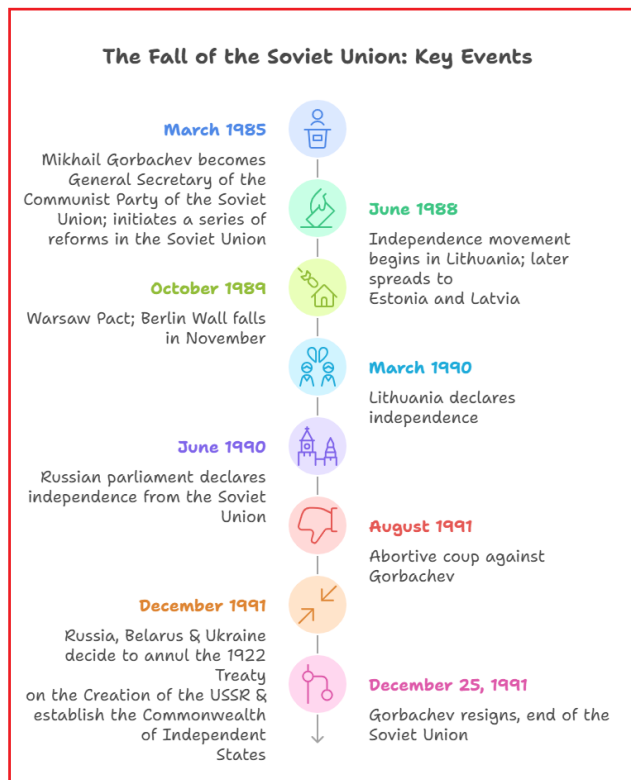


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Note:

- By December 1991, the **USSR dissolved** into **independent states**, marking the end of a **bipolar global order**.



How Did the Soviet Union's Collapse Reshape Global Power Dynamics?

- **Emergence of Unipolar World Order:** The USSR's collapse ended the **Cold War**, leaving the **US** as the sole superpower, reshaping global alliances.
 - **NATO** expanded eastward, integrating former Soviet bloc countries like Poland and the Baltic states, reducing Russian influence.
- **Capitalism Gained Global Dominance:** Western institutions like the **IMF** and **World Bank** directed economic transitions in former socialist states, promoting **liberal democracy** and **free-market capitalism**.
 - Eastern Europe's integration into the **European Union** reinforced US-led global hegemony.
- **Regional Power Shifts Strengthened Multipolarity:** The collapse allowed **China** and **India** to assert themselves in global geopolitics.

- Central Asian republics emerged as strategic players, balancing ties with Russia, China, and the West.

How Does the Legacy of the Soviet Union's Collapse Influence Contemporary Conflicts?

- **Nationalism And Unresolved Disputes:** The disintegration left **territorial disputes** unresolved, including Crimea and Eastern Ukraine, fueling secessionist movements.
 - Russia's 2014 **annexation of Crimea** and the ongoing war in Ukraine reflect its effort to reclaim Soviet-era influence.
- **Armenia-Azerbaijan Conflict:** The **Armenia-Azerbaijan conflict** over **Nagorno-Karabakh** stems from Stalin's 1923 decision to transfer the region to Azerbaijan, despite its majority Armenian population.
 - This decision sowed the seeds of ethnic tensions, which escalated into conflict after the Soviet collapse, as Armenia and Azerbaijan competed for control
- **Kosovo-Serbia Dispute:** **Kosovo** declared independence from **Serbia** in 2008, but Serbia and several countries still refuse to recognize it.
 - **Ethnic tensions** persist, particularly in **Serb-majority regions** like Northern Kosovo, contributing to ongoing instability and complicating the **Balkan peace process**.
- **NATO Expansion Escalates Tensions:** NATO's eastward growth is perceived by Russia as a direct threat, exacerbating its security concerns.
 - Also, this led to conflicts like that in **Afghanistan**, and its legacy continues to fuel geopolitical tensions and instability in **Eastern Europe and beyond**.
 - The **Russia-Ukraine war** symbolizes broader contestation between Western powers and Russian ambitions.
- **Energy Resources And Geopolitics Intertwine:** In absence of communist ideology and the USSR, Russia leverages its **oil, gas, and defense equipment** to exert influence, especially over **Europe**.

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Note:

How did the Soviet Union's Collapse Affect India?

- **Economic Diversification And Liberalization:** The collapse disrupted India's trade with the USSR, necessitating economic **liberalization in 1991** to attract foreign investment.
 - India diversified its partnerships through the **Look East policy (now Act East Policy)** to strengthen ties with **ASEAN** countries and the recent **Act West policy** to enhance trade and strategic relations with **Western nations**.
- **Defence Ties Adapted To New Realities:** India transitioned from being a mere importer of **Russian military hardware** to bridging the gap through joint production agreements, such as the **BrahMos missile**, to meet mutual defense needs.
 - India also expanded **defense cooperation** with the US, France, and Israel to reduce reliance on any single source.
- **Geopolitical Realignment For Strategic Autonomy:** India balanced relations with **Russia and the US**, maintaining strong ties with Moscow while engaging in US-led initiatives like the **Quad**.
 - India also joined other organizations like **BRICS** and **SCO** to strengthen its strategic autonomy, enhance multilateral partnerships, and promote a more balanced global order.
 - Access to Central Asian resources, especially through initiatives like the **International North-South Transport Corridor (INSTC)**, remained a priority.
- **Cultural And Scientific Collaborations:** Soviet-era cultural exchanges left a lasting legacy, with Indian films and literature enjoying enduring popularity in former Soviet states.
 - Collaboration in **space technology** and **nuclear energy** continued, enhancing bilateral relations.

Muslim League and Rise of Communal Politics in India

Why in News?

On **30th December 1906**, the All India Muslim League was founded in **Dhaka**, marking the inception of a political organization that played a pivotal role in India's Partition.

- Over the years, the League evolved from a group of elite Muslim men to a **mass political party** under the leadership of **Muhammad Ali Jinnah**, advocating for the creation of **Pakistan**.

What was the History and Impact of the All-India Muslim League?

- **Founders:** Elite Muslim leaders, including **Nawab Salimullah of Dhaka**, **Nawab Viqar-ul-Mulk**, **Nawab Mohsin Ul-Mulk** and **Aga Khan**.
 - The formation of the **All-India Muslim League** was preceded by the **Aligarh Movement**, which advocated for Muslim education and political awareness, and the **Simla Deputation (1906)**, where Muslim leaders met **Lord Minto II (1905-1910)** to demand special representation.
- **Initial Objective:** To protect the political and religious rights of Muslims and to secure separate representation for them in legislative bodies.
- **Emergence of Jinnah's Leadership:** Muhammad Ali Jinnah transformed the League into a mass political force, especially after the **Fourteen Points (1929)**, which outlined Muslim political demands like **federalism**, **minority safeguards**, and **autonomy**.
- **Key Agreements and Resolutions:**
 - **The Lucknow Pact (1916):** A rare moment of **Congress-Muslim League cooperation**. Leaders like **Bal Gangadhar Tilak** and **Muhammad Ali Jinnah** signed the pact, agreeing to work together for India's independence.
 - Congress accepted **separate electorates** for Muslims, a significant demand of the League. However, this also led to the **rise of communal politics in India**.
 - The pact called for **increased Indian representation in legislative and executive councils**. This was a high point of **Hindu-Muslim unity** in the freedom struggle.
 - **The Lahore Resolution (1940):** By 1940, under Jinnah's leadership, the League adopted a stance favoring Partition.
 - At its session in Lahore (1940), the League passed a resolution advocating for **"Independent States" for Muslims** in the northwestern and eastern regions where they were a majority.

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Note:

- The resolution, later termed the **Pakistan Resolution**, became the ideological foundation for the creation of Pakistan in 1947.
- **Direct Action Day:** Observed on **16th August 1946**, **Direct Action Day** is a **communal strike** called by the **All-India Muslim League**, led by Muhammad Ali Jinnah, to press for the creation of Pakistan.
 - It led to widespread **communal riots**, especially in Calcutta, resulting in thousands of deaths and property destruction. The violence deepened the **Hindu-Muslim divide** and accelerated the demand for partition.
- **Role in Partition:** Under Jinnah, the Muslim League led the demand for Pakistan, arguing that Muslims would not be **treated fairly in a Hindu-majority India**. This effort culminated in the 1947 Partition, creating India and Pakistan.
- **Post-Partition:** The League became Pakistan's **dominant party but fractured into various factions** over time. Its role in India waned, with some remnants forming regional political groups.

Jinnah's Fourteen Points, 1929

- **Background:**
 - **Nehru Report:** In 1928, the **All Parties Conference** was convened to discuss **parliamentary reforms** proposed by the **Simon Commission**.
 - The **Nehru Report**, led by Motilal Nehru, advocated for **Dominion Status** for India while **rejecting separate electorates** and Muslim seat reservations in Bengal and Punjab.
 - **Muslim Response:** Muslim leaders criticized the Nehru Report as being against Muslim interests. In March 1929, **Muhammad Ali Jinnah** presided over a **Muslim League session** in Delhi, where he presented his **Fourteen Points**, which became the League's manifesto and a cornerstone of its political strategy.
- **Jinnah's Fourteen Points:**
 - **Federal Constitution:** A federal system with residual powers allocated to provinces.
 - **Provincial Autonomy:** Complete autonomy for provinces.
 - **Constitutional Amendments:** Central amendments to require states' consent.

- **Muslim Representation in Legislatures:** Adequate Muslim representation without undermining majorities.
- **Representation in Services:** Fair representation in government services and self-governing bodies.
- **Central Legislature:** One-third Muslim representation in the central legislature.
- **Cabinet Representation:** One-third Muslim representation in central and provincial cabinets.
- **Separate Electorates:** Continuation of separate electorates.
- **Minority Safeguards:** Bills opposed by three-fourths of a minority group could not pass.
- **Territorial Redistribution:** Territorial changes not to harm Muslim-majority areas like Punjab, Bengal, and NWFP.
- **Sindh Separation:** Separation of Sindh from Bombay.
- **Constitutional Reforms:** Reforms for **North-West Frontier Province (NWFP)** and **Balochistan** to grant Muslims greater political autonomy in these regions.
- **Religious Freedom:** Guaranteed religious freedom for all communities.
- **Protection of Muslim Rights:** Safeguards for religion, culture, education, and language.

What is Communal Politics?

- **Communalism:** It refers to **strong attachment to one's own community, often religious**, with a focus on unity within the group.
 - **Positive aspects** of Communalism include it can promote social and economic upliftment within the community.
 - **Negative aspects** of Communalism emphasize the **group's superiority**, leading to **intolerance, division, and conflict** with other communities.
 - It suppresses **internal diversity** and prioritizes its own interests, fostering societal division.
- **Communal Politics:** It refers to the **mobilization of a religious community for political power**, often based on the belief that **religious identities equate to shared economic, political, and social interests**.

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Note:

➤ Pre- Independence Period:

- **British Influence:** Communal politics emerged as a tool under British colonial rule for bargaining privileges such as jobs, education, and political positions.
 - The British employed the “**Divide and Rule**” policy, fostering divisions between Hindus and Muslims to weaken nationalist unity.
 - The British supported communal forces through the **Communal Award, 1932** which strengthened the **Muslim League** and deepened its differences with the Congress.
- **Initial Goals:** Early communal politics, as championed by leaders like **Syed Ahmad Khan**, sought upward mobility for communities like Muslims.
- **Religious Mobilization:** Anti-colonial agitations like the **Akali agitations (1919-1926)**, the **Khilafat Movement (1920-21)**, contributed to deepening communal divisions.
- **INC and Communalism:** While committed to Hindu-Muslim unity, **Indian National Congress (INC)** dominance, and its use of **Hindu cultural symbols**, sometimes alienated Muslims.
 - Communal tensions escalated with the **Partition of Bengal (1905)** and the establishment of **separate electorates (1909)**.
- **Muslim League and Communalism:** The League portrayed Congress as a Hindu-dominated entity, intensifying **Muslim fears of marginalization in a unified India**.
- **Rise of Two-Nation Theory:** Communal ideologies like **Hindutva (Vinayak Damodar Savarkar)** and the **Muslim League’s** demand for Pakistan culminated in the **Partition of India**.

➤ Post-Independence Period:

- **Legitimacy and Openness:** Communal politics gained mainstream acceptance, especially with the rise of **religious identity-based ideologies** in the 1980s.
 - It began to challenge **secularism** and **pluralism**, advocating for a nation centered around a **majority religious identity**.

- **Use of Violence:** Riots and pogroms are often planned and orchestrated to achieve **electoral and economic objectives**.
- **Social Media:** Spread of **hate speech**, and **fake news** on social platforms, escalating communal tensions.
- **Caste and Communal Politics:** Intersection of **caste and religious identity politics**, leading to further divisions.
- **Judiciary’s Role:** Judicial interventions are **slow**, with selective justice in communal violence cases.

Note: Religiousness in India has always been **rooted in spirituality and personal harmony**, guiding social life, whereas communalism **largely emerged due to British colonial policies**.

- While religiousness promotes inner peace and social harmony, communalism is often driven by **politics**, and grievances between communities.

Why Does Communal Politics Thrive?

- **Economic Underdevelopment:** Poverty, unemployment, and lack of infrastructure make communities susceptible to **communal mobilization**.
- **Political Opportunism:** Communal narratives provide **shortcuts to power**, distracting from governance failures and economic issues.
 - Political parties, especially those with communal ideologies, often face **little repercussions for engaging in divisive rhetoric**, as they align with **vote-bank politics**.
- **Control Over Resources:** Communal violence is often used to **eliminate business competition** or seize properties, especially in economically competitive regions.
- **Polarising Narratives:** The rhetoric of blaming one community for economic issues fuels division, especially among **marginalized groups**.
 - It shifts focus from poor governance to **inter-community rivalry, deepening divisions**.
- **Weak Legal Enforcement:** Inadequate laws against communal violence encourage those who use communal violence for political advantage.



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Note:

Art and Culture

Highlights

- Harvest Festivals
- Modhweth Festival
- Sanskrit Inscription Found in POK
- 162nd Birth Anniversary of Swami Vivekananda

Harvest Festivals

Why in News?

The **President** of India has greeted citizens on the eve of **Lohri, Makar Sankranti, Pongal and Magh Bihu**.

- These are **harvest festivals** celebrated in **diverse forms** across the **various regions of India**.

What are the Harvest Festivals in India?

- **About:** They are celebrated to mark the end of the **harvesting season** across India under various names e.g., **Makar Sankranti, Pongal, Magh Bihu, Lohri**, etc.
- **Astronomical Significance:** It marks the **transition of the Sun into the Capricorn (Makara) zodiac sign** and the **start of the Sun's northward journey (Uttarayan)**.
 - It represents the shift from **winter to warmer months**, symbolizing the end of inactivity.
 - Unlike festivals based on the lunar cycle, it follows the **solar cycle**, resulting in a fixed date of **14th January**.
- **Cultural Significance:** Sankranti rituals, including **bathing, offering Naivedhya (food) to Lord Surya, giving charity, performing Shraddha, and breaking fast**, are performed during the day.
 - Devotees often bathe in sacred rivers like the **Ganga, Yamuna, Godavari, Krishna, and Cauvery**.
- **Regional Celebrations:**
 - **Tamil Nadu (Pongal):** The **four-day festival** marks the **rice harvest**, with **Tamilians** decorating their homes with traditional **kolams** made from **rice powder**.
 - **Karnataka:** Locals have a tradition of sharing **sesame and jaggery mixture** symbolising harmony and goodwill.

- Farming communities dress their **cattle in colorful costumes and jewels**, making them jump over a fire pit in a display called '**Kicchu Haisodu**'.
- **Punjab (Lohri):** Lohri involves **bonfires, folk songs**, and offerings like groundnuts and popcorn to the fire.
- **Bihar:** A festival called '**Khichdi**' is celebrated and a dish of the **same name (rice and lentils)** is prepared. **Sesame and jaggery ladoos** or chikkis are distributed.
- **Rajasthan and Gujarat:** Celebrated with **kite-flying competitions and festivals**, including the **International Kite Festival** in Ahmedabad.
 - In the evening, **sky lanterns** light up the skies.
- **Assam (Magh Bihu):** Magh Bihu in Assam celebrates the **annual harvest** and marks the beginning of the **Assamese new year**.



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Note:

Modhweth Festival

Why in News?

The Toda tribe, one of the **oldest Dravidian ethnic groups** in the **Nilgiris Hills of Tamil Nadu**, celebrated their traditional 'Modhweth' festival to mark the New Year.



What is the Modhweth Festival?

- **About:**
 - It is celebrated annually on the last Sunday of December or the first Sunday of January.
 - It is held at **the Moonpo temple in Muthanadu Mund village**, located in the **Nilgiri district**.
 - The Moonpo temple features a **unique vertical spire with a thatched roof and a flat stone on top**, making it one of the last Toda temples of its kind in the Nilgiris.
- **Rituals and Celebrations:**
 - Prayers are offered to the deity, **Thenkish Amman**, for good health, rains, and a bountiful harvest in the coming year.
 - **Participants perform a dance outside the temple** as part of the celebrations.
- **Unique Customs:**
 - Toda youth showcase their **strength and masculinity by lifting a greased boulder** weighing around 80 kg.
 - As per traditional customs, **women do not participate in the celebrations**.

What is the Toda Tribe?

- **About:**
 - Toda Tribe is a **pastoral tribe** of the **Nilgiri Hills of southern India**.
 - The Todas are classified as a **Particularly Vulnerable Tribal Group (PVTG)** in Tamil Nadu.
 - The Toda language is **Dravidian** but is the **most unusual and different** among the languages belonging to the Dravidian family.
- **Significance:**
 - Toda lands are part of the **Nilgiri Biosphere Reserve**, designated as an **International Biosphere Reserve by UNESCO**.
 - Their territory is recognized as a **UNESCO World Heritage Site**.
- **Religion and Beliefs:**
 - Their religious practices revolve around a **pantheon of gods**, with **Tökisy (goddess)** and **Ön (god of the underworld)** as the central deities.

Nilgiri Biosphere Reserve

- **About:**
 - It was the **first biosphere reserve in India established in 1986**.
 - The reserve spans across three Indian states: **Tamil Nadu, Karnataka, and Kerala**.
 - It is **India's first biosphere reserve under UNESCO's Man and the Biosphere Programme**.
 - Home to several tribal groups such as the **Adiyan, Aranadan, Kader, Kurichian, Kuruman, and Kurumbas**.
 - It portrays the confluence of **Afro-tropical and Indo-Malayan biotic zones** of the world.
- **Fauna:**
 - Animals like **Nilgiri tahr**, Nilgiri langur, gaur, **Indian elephant** and freshwater fishes such as Nilgiri danio (*Devario neilgherriensis*), Nilgiri barb are found here.
- **Protected Areas in NBR:**
 - The **Mudumalai Wildlife Sanctuary, Wayanad Wildlife Sanctuary, Bandipur National Park, Nagarhole National Park, Mukurthi National Park** and **Silent Valley** are the protected areas present within this reserve.

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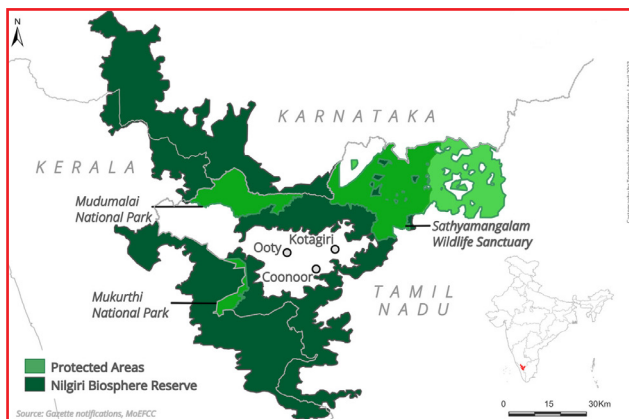
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Note:



Sanskrit Inscription Found in POK

Why in News?

Recently, a 4th century CE Sanskrit inscription was found near Gilgit in Pakistan-Occupied Kashmir (POK), written in Brahmi script.

- The inscription found in Gilgit mentions “Pushpasingha” installing a Mahesvaralinga for the merit of his guru (name partially lost).

Note:

- Earlier in 2024, a 10th-century CE Sanskrit and Sharada script (used in Kashmir for Sanskrit and Kashmiri) inscription was discovered near Peshawar, referencing **Buddhist** Dharini chants with the mention of “Da(Dha)rini” in line six.
 - **Buddhist Dharini** refers to sacred mantras or chants used in **Buddhism** for protection, purification, and invoking blessings.
 - These chants are believed to have spiritual power and are often recited in rituals to promote well-being. Dharinis typically contain sacred syllables or phrases.

What is the Importance of Historical Inscriptions?

- **Primary Historical Sources:** Inscriptions are authentic and direct sources for reconstructing **ancient Indian history**, offering evidence free from later interpolations and biases.
 - Dates and events inscribed help in establishing accurate historical timelines.

- **Insight into Political History:** They provide valuable details about rulers, dynasties, conquests, treaties, and administration in ancient India.
- **Administrative Systems:** Inscriptions often include information about revenue systems, land grants, **taxation**, and judicial frameworks.
 - For example, the **Junagarh (Girnar) Inscription of Rudradaman** describes the construction and repairs of the **Sudarshana Lake dam**, providing evidence of administrative priorities in water management.
- **Linguistic Evolution:** Inscriptions document the development of languages, scripts, and literary styles.
 - The **Ashokan Edicts**, inscribed in **Prakrit**, **Greek**, and **Aramaic**, highlight the linguistic diversity and the use of local scripts to communicate governance effectively.
- **Socio-Economic Structures:** Insights into trade practices, societal norms, caste systems, and economic transactions are often gleaned from inscriptions.
 - Inscriptions reveal details about **ancient religions**, **temple construction**, **rituals**, and **royal patronage**.

Some Important Inscriptions of Ancient India

- **Political Inscriptions:**
 - **Junagarh (Girnar) Inscription (Rudradaman):** A 2nd-century CE Sanskrit inscription detailing **Rudradaman's achievements** and mentioning the construction of the **Sudarshana Lake dam** by **Chandragupta Maurya's** governor, Pushyagupta.
 - **Bhitari Pillar Inscription:** Chronicles **Skandagupta's** military success against the **Hunas** and his administrative reforms.
- **Administrative and Land Grant Inscriptions**
 - **Paharpur Inscription (Buddha Gupta):** Found in Bangladesh, it highlights land grants and religious patronage during the Gupta period.
 - **Mandsaur Inscription:** Details **Yashodharman's** victory over the Huns, emphasizing his role in restoring stability in the region.
 - **Gwalior Inscription (King Bhoja I):** Describes grants to Brahmins and mentions **Agraharas**, reflecting socio-economic practices under the **Gurjara-Pratiharas**.
 - **Banskhera Copper Plate:** Signed by **Harshavardhana**, it provides details about his ancestry, administration, and governance.
 - **Deopara Prashasti:** Celebrates the achievements of **Bengal's Vijay Sena**, providing insights into the socio-political scenario of the time.

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Note:

INSCRIPTIONS AND ROCK EDICTS



Sohgaura Copper Plate

- 📍 Location - Sohgauna, Gorakhpur (UP)
- 📖 Mentions - Famine relief efforts
- 🗣️ Language - Prakrit*
- 🏛️ Features - **Mauryan dynasty**
 - ➡️ Earliest-known copper plate
 - ➡️ (Rare) **Pre-Ashokan Brahmi inscription**

Ashokan Edicts

- 📍 Location - Eastern India
- 📖 Mentions - Ashoka's view of Dharma (Buddhist philosophy)
- 🗣️ Language - Magadhi Prakrit*
- 🏛️ Features - 33 inscriptions (pillar edicts, Major rock edicts, Minor rock inscriptions)
 - ➡️ **1st tangible evidence of Buddhism**
 - ➡️ Ashoka as **Devanampiyadasi** "Beloved servant of the God"

Rummindei Pillar Edicts

- 📍 Location - Lumbini, Nepal
- 📖 Mentions - Ashoka's visit to Lumbini and tax exemptions he made there
- 🗣️ Script - Brahmi
- 🏛️ Features - Minor pillar inscriptions

Prayag-Prashasti (Allahabad Pillar)

- 📍 Location - Allahabad Fort (earlier Kaushambi)
- 📖 Mentions - Ashoka Stambh but with 4 different inscriptions
- 🗣️ Script - Brahmi
- 🏛️ 4 Inscriptions include -
 - ➡️ Usual Ashokan Inscriptions
 - ➡️ Queen's Kaurwaki edict
 - ➡️ Samudragupta's conquests by Harisena
 - ➡️ Jahangir's inscriptions in Persian

Mehrauli Inscription (Mehrauli Iron Pillar)

- 📍 Location - Qutub Minar complex, Delhi
- 📖 Mentions - Credits **Chandragupta II** for the conquest of Vakatakas and Vanga countries
- 🗣️ Script - Brahmi
- 🏛️ Features - **Gupta dynasty**
 - ➡️ Pillar estd by Chandragupta II as **Vishnupada** (in honor of Lord Vishnu)
 - ➡️ Notable for rust-resistant metal composition

Kalsi Inscription

- 📍 Location - Kalsi town (Uttarakhand)
- 📖 Mentions - Ashoka's humane approach in administration, non-violence, spirituality
- 🗣️ Language - Prakrit*
- 🏛️ Features - Only place in north India to have 14 Ashokan rock edicts

Maski Inscription

- 📍 Location - Maski (an archaeological site in Karnataka)
- 📖 Mentions - Dharma shasana (promotes Buddhist tenets)
- 🗣️ Language - Prakrit*
- 🏛️ Features - 1st edict to contain Ashoka's name instead of Piyadasi.

Kalinga Edicts

- 📍 Location - Kalinga, Odisha
- 📖 Mentions - Kalinga war turning point for Ashoka
- 🗣️ Language - Magadhi Prakrit, Script - Brahmi
- 🏛️ Features - Set of 11 out of 14 rock edicts
 - ➡️ 2 special rock edicts signifying pacification
 - ➡️ Ashoka gave up **Digvijaya**, adopted non-violence & Buddhism.

Aihole Inscription

- 📍 Location - Meguti temple, Karnataka
- 📖 Mentions - **Pulakeshin II** defeated Harshavardhana
- 🗣️ Language - Sanskrit; Script - Kannada
- 🏛️ Features - Chalukya victory → Pallavas
 - ➡️ Capital: **Aihole → Badami**
 - ➡️ Written by Ravikirti (Pulakeshin II's court poet)
 - ➡️ Samudragupta's conquests by Harisena

AIHOLE WAS THE FIRST CAPITAL OF CHALUKYAS

Hathigumpha Inscription (Elephant Cave Inscription)

- 📍 Location - Udaygiri-Khandgiri Caves, Odisha
- 📖 Mentions - History of King Kharvela - a champion of Jainism
- 🗣️ Language - Prakrit*
- 🏛️ Features - **Mahameghavahana dynasty**

NOTE: *implies that wherever language is Prakrit, the script is Brahmi



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Note:

162nd Birth Anniversary of Swami Vivekananda

Why in News?

On **National Youth Day** (162nd birth anniversary of **Swami Vivekananda**), Prime Minister participated in the **Viksit Bharat Young Leaders Dialogue 2025**.

- The **National Youth Day** is celebrated on **12th January** to commemorate the great spiritual leader, philosopher and thinker **Swami Vivekananda**.
- The **National Youth Policy 2014** defines youth as the persons in the age group of **15-29** which constitute **nearly 40% of India's total population**.

What is the Viksit Bharat Young Leaders Dialogue?

- **About:** It is a platform aimed at **engaging youth in nation-building**, aligning with the Prime Minister's Independence Day call to **involve 1 lakh youth in politics without political affiliations**.
- **Participation:** The event brings together **3,000 dynamic youth aged 15-29 years**, selected through a **merit-based, multi-stage process** called the Viksit Bharat Challenge.
- **Thematic Focus:** Young leaders will present ideas on **ten thematic areas** critical to India's development, including **technology, sustainability, women empowerment, manufacturing, and agriculture**.

What are Key Facts Regarding Swami Vivekananda?

- **About:** Swami Vivekananda, born as **Narendra Nath Datta** on **12th January 1863**, was a monk and the chief disciple of **Ramakrishna Paramhansa**.
 - In **1893**, upon the request of **Maharaja Ajit Singh** of the Khetri State, he took the name '**Vivekananda**', changing from '**Sachidananda**' that he used before.
- **Enlightenment:** In **1892**, Swami Vivekananda was said to have swum to a **rock** (later named **Vivekananda Rock Memorial**) in the Indian Ocean from the shores of **Kanyakumari for meditation**.
 - He spent **three days and nights there**, resulting in his **enlightenment**.
- **Contributions:**
 - **Philosophical:** He introduced the world to the Indian philosophies of **Vedanta** and **Yoga**.

- He preached '**neo-Vedanta**', an interpretation of **Hinduism through a Western lens**, and believed in combining **spirituality with material progress**.
- **Spiritual:** Vivekananda's message on human values draws from the **Upanishads, the Gita**, and the examples of **Buddha** and **Jesus**, emphasizing **self-realization, compassion, and selfless service**.
 - He advocated the doctrine of **service**. Serving **jiva** (living beings) is considered **worship of Shiva**.
 - He gave the **four pathways** of attaining **moksha (liberation)** from the worldly pleasure and attachment in his books- **Raja-yoga, Karma-yoga, Jnana-yoga and Bhakti-yoga**.
- **Revivalism:** He laid emphasis on **education** for the **regeneration** of our motherland. He advocated a **man-making character-building education**.
- **Core Values:**
 - **Youth:** He encouraged the youth to **commit to their goals** for success, stressing the importance of dedication in facing challenges.
 - Swamiji urged them to develop both **mental and physical strength**, with '**muscles of iron**' and '**nerves of steel**'.
 - **Ethics:** Ethics is a **code of conduct** that guides a person to be a good citizen, and purity, being our **true divine Self or Atman, reflects our real nature**.
 - **Religion:** His view of religion sees it as a **universal experience** of transcendent reality, **free from superstition, dogma, priestcraft, and intolerance**.
 - **Education:** Vivekananda emphasized education that reveals students' **innate knowledge and power**, focusing on **character-building** and making them self-reliant to face life's challenges.
 - **Rationality:** He fully **supported** the methods and results of **modern science** and did not reject reason in favor of faith.
 - **Nationalism:** His nationalism is based on **Humanism and Universalism**, the two cardinal features of Indian spiritual culture.
 - His nationalism is based on concern for the masses, freedom, equality, and **Karma Yoga** — a path to **political and spiritual freedom** through selfless service.
- **Associated Organisations:** He founded the **Ramakrishna Mission** in **1897** to propagate the ideals of **service, education, and spiritual upliftment**.

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Note:

- In 1899, he established the **Belur Math**, which became his permanent abode.
- **International Address:** He addressed the **Parliament of Religions** held in Chicago in 1893, at which he represented Hinduism.
- In July, 1896, he addressed a conference of the **London Hindu Association** in London.

INDIAN SCHOOLS OF PHILOSOPHY (ORTHODOX)

Indian Philosophy refers to traditions of philosophical thought, originated in the Indian subcontinent. It is divided into 2 schools of thought: Orthodox and Heterodox

Orthodox school believed that Vedas were the supreme revered scriptures that hold the secrets to salvation.

Samkhya School

- ④ Founded by Kapil Muni.
- ④ Oldest school of philosophy.
- ④ Postulates that reality stems from purusha (self, soul or mind) and prakriti (matter, creative agency, energy).
- ④ **It went through two phases of development:**
 - Original Samkhya (Materialistic Philosophy)
 - New Samkhya (Spiritual Philosophy)

Yoga School (Union of two major entities)

- ④ Founded by Patanjali.
- ④ Humans can achieve salvation by combining meditation and physical yogic techniques.

Means of Achieving Freedom	Ways of Achieving
Yama	Practicing self-control
Niyama	Observation of the rules governing one's life
Pratyahara	Choosing an object
Dharna	Fixing the mind (over the chosen object)
Dhyana	Concentrating on the (above-mentioned) chosen object
Samadhi	It is the merging of the mind and the object and that leads to the final dissolution of the self

Nyaya School

- ④ Founded by Gautama rishi.
- ④ Everything should be in accordance with reason and experience.
- ④ **Means of Attaining Knowledge:** perception, inference, comparison, and verbal testimony.

Vaisheshika School

- ④ Founded by Kanada rishi.
- ④ Everything is created by fire, air, water, earth and ether (sky).
- ④ Developed atomic theory (all material objects are made of atoms).
- ④ **Reliance:**
 - God is the guiding principle.
 - Laws of Karma guide this universe.

Mimamsa School/ Purva Mimamsa

- ④ Founded by Kanada rishi.
- ④ Vedas are eternal and possess all knowledge.
- ④ Religion means the fulfilment of duties prescribed by the Vedas.

Vedanta School (End of the Vedas/Upanishads)

- ④ Philosophical teachings of the Upanishads (mystic/spiritual contemplations within Vedas).
- ④ **Sub-schools:**
 - Advaita (Adi Shankara): Both the individual self (Atman) and Brahman are same.
 - Visishtadvaita (Ramanuja): All diversity is subsumed to a unified whole.
 - Dvaita (Madhvacharya): Brahman and Atman as 2 different entities.
 - ◆ Bhakti is route to salvation.
 - Dvaitadvaita (Nimbarka): Brahman is the highest reality.
 - Shuddhadvaita (Vallabhacharya): God and the individual self are the same.
 - Achintya Bheda Abheda (Chaitanya Mahaprabhu): Individual self (Jivatman) is both different and not different from Brahman.



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Note:

Views Related to Vivekananda

- No other religion preaches the **dignity of humanity** in such a lofty strain as Hinduism and no other religion on earth treads upon the poor and the low in such a fashion as Hinduism. —**Swami Vivekananda**.
- A country where **millions** have nothing to eat and where **few thousand holy men and brahmins suck the blood** of the poor and do nothing at all for them, is not a country but a living hell. Is this religion or a dance of death? —**Swami Vivekananda**
- Forget not that the **lower classes**, the ignorant, the poor, the illiterate, the cobbler, the sweeper are thy flesh and blood, **thy brothers**. —**Swami Vivekananda**.
- So far as **Bengal** is concerned Vivekananda may be regarded as the **spiritual father** of the **modern nationalist movement**. —**Subash Chandra Bose**.

National Youth Policy (NYP) 2014

- **About NYP 2014:** It is a policy framework by the **Ministry of Youth Affairs and Sports** to **empower the youth of India** to achieve their **full potential** and **participate actively** in the development of the country.
- **About NYP 2024:** The Government has **reviewed and updated** the NYP 2014, and has released a draft for the **new NYP 2024**.
 - This draft outlines a **ten-year vision** for youth development in India, aligned with **Sustainable Development Goals (SDGs)**.
 - It focuses on five main areas: **education, employment, youth leadership, health, and social justice**, with a commitment to social inclusion.
 - Key points include:
 - A clear plan to achieve **youth development goals by 2030**.
 - Alignment with the **National Education Policy 2020** to improve career and life skills.
 - Strengthening leadership and volunteering opportunities and using **technology** to empower youth.
 - Enhancing healthcare, especially **mental health and reproductive health**, and promoting **sports and fitness**.
 - Ensuring **safety, justice, and support for marginalized youth**.



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Note:

Geography

Highlights

- Record Global Warming and its Effect on India
- Landslide and Preventive Measures
- Earthquake in Tibetan China and Nepal
- La Nina: Impacts, Mechanisms, and Predictions
- Polar Vortex
- Climate Change and African Easterly Waves
- Artesian Well in Rajasthan and Tethys Sea

Record Global Warming and its Effect on India

Why in News?

The [World Meteorological Organization \(WMO\)](#) has confirmed that **2024 is the warmest year on record**. The past ten years **2015-2024** are the ten **warmest years** on record.

- According to [IMD](#), the temperature increase in **India is lower than the global average rise** in temperature.
- However, concerns exist that **global climate models** don't accurately reflect changes in **India**, highlighting the need to **improve its climate observation** and impact assessment capabilities.

What are the Key Findings by the WMO?

- **Record Global Temperature:** In 2024, the global average surface temperature was **1.55°C above the pre-industrial levels (1850-1900 period)**, marking the **first year** with a temperature **exceeding 1.5°C above** this baseline.
- **Ocean Heat:** The **top 2000 meters of ocean water** absorbed a record **16 zettajoules of heat**, roughly **140 times the total global electricity generation** in 2023.
 - Around **90%** of excess heat from global warming is **stored in the ocean**.
- **Temperature Assessment:** Although 2024's temperature surpassed **1.5°C**, the WMO assures that the [Paris Agreement](#)'s goals remain **intact**.

- It emphasizes that **every fraction** of a degree worsens climate impacts on **ecosystems and human systems**.
- The **Paris Agreement** is a **legally binding** global agreement under [UNFCCC](#) to limit global warming to well **below 2°C above pre-industrial levels**, with an **ambition to limit warming to 1.5°C**.

- **Warming in India:** [India Meteorological Department \(IMD\)](#) said that in 2024 India was **0.65 degrees Celsius** higher than normal but lower than the **global average of 1.55°C**.

- **IMD data** shows that temperature over India in **2024** was about **1.2 °C higher** than the **1901-1910 average**.

Note: Land temperatures have risen by **1.59°C** since preindustrial times, while **oceans** have warmed by **0.88°C**, according to the [6th IPCC report](#).

What are the Reasons Behind Lower Warming Over India?

- **Geographic Location:** Global temperature rise has been **more noticeable at higher latitudes**, especially near the **poles**, due to heat transfer from the **tropics** through **air circulation systems** and the fact that **higher latitudes** already have **lower temperatures**.
 - India is located in the **tropical zone**, closer to the equator which does not experience such **geographical phenomenon**.
- **Albedo Effect:** In the [Arctic region](#), higher heating is caused by **low albedo effect**, where melting ice exposes land or water that **traps more heat than ice-covered surfaces**, which reflect sunlight.

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Note:

- In India, **albedo effect on snow** is restricted to **Himalayan areas**.
- **Aerosols and Pollution:** The **particulate matter** and **aerosols** have a **cooling effect** because they scatter the **solar radiation** back into space. Aerosols also help in **cloud formation** which, in turn, help in reflecting sunlight back to space.
- **High air pollution** in India due **particulate matter and aerosols** have a **small unintended consequence** of lowering the temperature rise.
- **Altitude Variations:** India's landmass is **not uniform**, with distinct variations in temperature rise across regions.
- Some areas see more warming due to **local climate and geography**, but the national average temperature rise remains lower.

Other Global Warming Related Findings

- **Exposure to Extreme Heat:** India, China, Indonesia, Nigeria, and Bangladesh were the **top five countries** with the **highest total hours of exposure to extreme heat** in 2020.
 - From **1995 to 2020**, global exposure to extreme heat due to trade increased by **89%**, from 221.5 billion person-hours to 419.0 billion person-hours.
- **Disproportionate Exposure:** **Lower-middle-income and low-income economies** accounted for **53.7% and 18.3%** of global exposure to extreme heat, respectively, while contributing only **5.7% and 1%** of global labor compensation.
 - In **2020**, **Germany** had only **28.1 hours of extreme heat exposure per capita**, and the **United States** had **260.9 hours**, while countries like **Thailand and Nigeria** had much higher figures (**1319.5 and 1186.8 hours per capita**, respectively).

What are the Consequences of Rising Global Temperatures?

- **Sea Level Rise:** **Global sea level** has risen by about **8 inches** since **1880** and is projected to rise by at least another **foot by 2100** inundating coastal areas, displacing communities, and disrupting ecosystems.
 - Oceans **absorb** significant **CO₂**, increasing acidity and harming marine life.
- **Droughts and Heat Waves:** **Droughts** and **heat waves** are likely to intensify, while **cold waves** are expected to weaken and occur less frequently.
 - Warming and prolonged drought have intensified **wildfire** seasons and increased fire risks.
- **Biodiversity Loss:** Rising temperatures and shifting weather **disrupt ecosystems**, driving many species toward **extinction**.
- **Related Effects:** Extreme weather disrupts **food production**, causing shortages and **price hikes**, while rising temperatures **worsen air quality**, increase heat illnesses, and spread diseases.

OCEAN WARMING

The ocean absorbs most of the excess heat due to global warming caused by greenhouse gas (GHG) emissions, leading to rising ocean temperatures

Increase in Ocean Temperature
1.2°C from 1950 to 2020

Projected to Future Increase
1.7°C to 3.8°C from 2020 to 2100

Impact of Ocean Warming

- ⑤ **Sea Level Rise:** Warmer water expands, causing sea levels to rise
- ⑤ **Coral Bleaching:** Corals expel the algae (zooxanthellae) living in their tissues and turn completely white
- ⑤ **Ocean Acidification:** Ocean absorbs ~1/4th of total CO₂, thus making it more acidic (non-metallic oxides - acidic in nature)
- ⑤ **Impacts on Marine Life:** Causes many marine species to shift towards the poles and disrupts food webs
- ⑤ **Impacts on Climate Patterns:** Influences atmospheric circulation patterns, such as El Niño and La Niña & extreme weather events

Causes of Ocean Warming (due to Global Warming)

- ④ **GHG Emissions:** Fossil fuels burning releases CO₂ and GHG
- ④ **Deforestation:** Lesser trees → More CO₂ & GHG → Global Warming → Warming of Ocean
- ④ **Industrial Activities:** Emit various pollutants that contribute to greenhouse effect
- ④ **Agricultural Practices:** Produces methane and nitrous oxide – potent greenhouse gases
- ④ **Heat Absorption by Oceans:** Oceans absorb ~90% of excess heat generated by GHGs



How India Can Better Observe Global Warming?

- **Expansion of Weather Stations:** India needs to expand its **weather stations**, especially in rural areas, with stations in every major panchayat under the **Viksit Bharat vision for 2047**, to gather real-time data for accurate climate assessments.
- **Enhancing Computing Capabilities:** India must invest in **advanced computing and analysis infrastructure** to process climate data for improved **disaster management**, agricultural forecasting, and climate resilience strategies.

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Note:

- **Regular Impact Assessments:** India needs to conduct **India-specific** climate change impact assessments to track the evolving climate risks like **sea level rise**, and **ecosystem changes**.
- **Mission Mausam:** **Mission Mausam** should be strengthened and integrated with national and international systems for better **weather prediction**, especially in coastal and mountainous regions.
 - Mission Mausam aims to **enhance** India's ability to **predict and respond to extreme weather events** and the impacts of **climate change**.
- **Localized Impact Studies:** India needs to invest in **localized studies** that reflect the specific climate challenges faced by different regions such as the **Himalayas**, **coastal areas**, and **urban centers** for targeted adaptation strategies and policy interventions.

What is the World Meteorological Organization (WMO)?

- The **World Meteorological Organization (WMO)** is an intergovernmental organisation with a membership of **192 Member States and Territories**.
 - **India** is a member of WMO.
- It originated from the **International Meteorological Organization (IMO)**, which was established after the **1873 Vienna International Meteorological Congress**.
- Established by the ratification of the WMO Convention on **23rd March 1950**, WMO became the **specialised agency of the UN for meteorology (weather and climate), operational hydrology and related geophysical sciences**.
- WMO is headquartered in **Geneva, Switzerland**.

Landslide and Preventive Measures

Why in News?

A study published in **Nature Natural Hazards** on the **July 2024 Wayanad landslides** emphasizes the need for **better disaster management strategies** in vulnerable areas.

- In **July 2024**, Wayanad district in Kerala experienced a **devastating landslide disaster** caused by **extreme rainfall** and **fragile ecological conditions**.

What are the Key Facts Regarding the Study?

- **About:** The study aimed to understand the behavior of **rapid debris flows** and **improve disaster management strategies** in vulnerable areas like **Wayanad, Kerala**.
- **Research Methodology:** The study used advanced **run-out modelling** and **Rapid Mass Movement Simulation (RAMMS)** to track debris **flow paths**, **speed**, **pressure**, and **material accumulation** during landslides.
 - **Runout analyses** are used to assess risks and design measures against rapid landslides, including **debris flows**, **rockslide avalanches**, and failures of fill and **mining waste**.
 - RAMMS evaluates **natural hazard processes** and assesses **protective measures** through a user-friendly **graphical interface**.
- **Key Findings:**
 - **Debris Accumulation:** Significant debris accumulation was observed at **lower elevations** of slope, creating future **hazards downstream**.
 - **Vulnerability Mapping:** Detailed **vulnerability maps**, including run-out paths, are crucial for identifying **high-risk zones** and preventing development in low lying areas to **minimize destruction and loss of life**.
 - **Historical Context:** The path of the 2024 debris flow at Wayanad **mirrored** previous events, including a deadly landslide in **1984** and a smaller one in **2019**.
- **Early Warning Systems:** The study emphasizes the need for **rainfall** and **soil moisture** monitoring stations to set early warning thresholds, enabling timely alerts for evacuations and safety measures to save lives.

Wayanad Landslides

- Wayanad's terrain consists of a **soil layer over hard rocks**. Intense **rainfall saturates** the soil, weakening its bond **with the rocks and causing landslides**.
- The recent warming of the **Arabian Sea** has led to **deep cloud systems** and extremely **heavy rainfall** in the **Western Ghats**, heightening landslide risks.
- Climate change has also shifted the **rain-bearing belt**, leading to more **convective rainfall** in southern regions like Wayanad.

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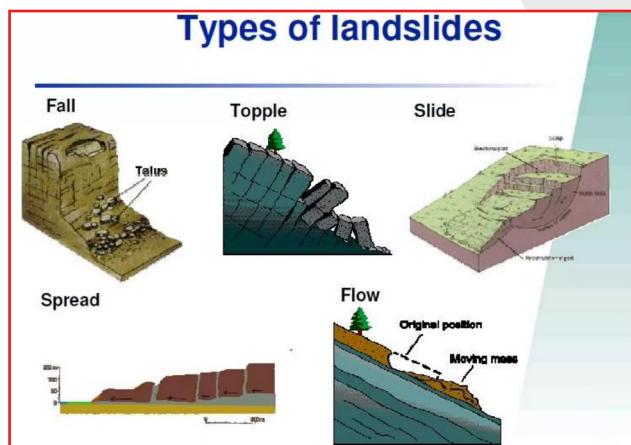


Note:

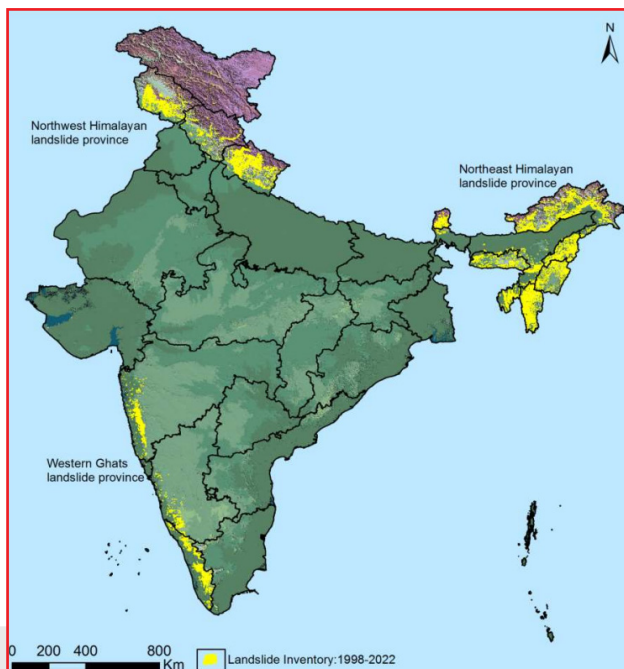
- Convective rainfall occurs when **heated air rises with water vapor, condenses at higher altitudes**, and releases rainfall in the same area without being carried away by wind.

What are Landslides?

- **About:** A landslide is the **downward movement of rock, soil, and debris** on a slope, triggered by factors such as **heavy rainfall, earthquakes, volcanic activity, human activities**, and groundwater changes.
- **Types:**
 - **Slides:** Movement along a **rupture surface**, including rotational and translational slides.
 - **Flows:** Soil or rock mixed with water moving like a **fluid**, such as **earth flows**, debris flows, mudflows, and creep.
 - **Spreads:** **Lateral extension** and cracking of the mass, often due to **liquefaction**.
 - **Topples:** **Forward rotation** and free-fall from a vertical or near-vertical slope.
 - **Falls:** Detachment from a steep slope or cliff, descending by free-fall, **bouncing**, or **rolling**.



- **Landslide Prone Areas:** As per the **Landslide Atlas of India**, around **0.42 million sq. km (12.6% of land area)** is prone to landslides, with **0.18 million sq. km** in the **North East Himalaya**, **0.14 million sq. km** in the **North West Himalaya**, **0.09 million sq. km** in the **Western Ghats** and Konkan hills, and **0.01 million sq. km** in the **Eastern Ghats** of Andhra Pradesh.



Causes:

- **Gravitational Forces:** When **gravity** overcomes the strength of materials like **rocks, sand, silt, and clay**, the **slope collapses**, causing these materials to move downhill.
- **Natural Factors:**
 - **Rainfall:** Heavy or **continuous rainfall increases soil moisture**, weakens cohesion, and adds weight to slopes, making them more likely to fail.
 - **Earthquakes:** Earthquakes **destabilize slopes** by shaking the ground and weakening geomaterials, particularly in **tectonically active regions** like the **Himalayas**.
 - **Hydrological Factors:** **Water seepage** through porous materials raises pore pressure and weakens the slope.
- **Anthropogenic Factors:** **Deforestation** destabilizes slopes by removing vegetation and tree roots that provide **reinforcement and water drainage**.
 - **Mining, road construction, and urban development** disrupt natural drainage and load distribution, raising landslide risks.
- **Geological Factors:** Geological factors like **material composition, structure, and weathering** affect slope stability.

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Note:

- The **Western Ghats' steep, dual-layered terrain** makes them prone to landslides when rainwater saturates the soil, increasing weight and reducing stability.

How are Landslides in Himalayan Region Different from Landslides in Western Ghats?		
Cause	Himalayas	Western Ghats
Slope and Terrain	Steep, rugged terrain with high-altitude, unstable slopes.	Less steep and more gradual slopes , reducing landslide risk.
Tectonic Activity	Highly tectonically active region due to the collision of the Indian and Eurasian plates, triggering earthquakes.	Less tectonic activity, with minimal earthquake-triggered landslides .
Rainfall and Snowmelt	Heavy monsoon rainfall combined with rapid snowmelt from glaciers , increasing soil saturation and instability.	Heavy rainfall during monsoon , but no snowmelt, reducing landslide triggers.
Soil and Rock Composition	Unconsolidated debris (scree, moraine) and fragile rock formations prone to displacement.	More stable soil and rock types , reducing landslide occurrences.
Deforestation	High rates of deforestation for agriculture, timber, and fuel, weakening soil cohesion.	Less deforestation compared to the Himalayas, although still a concern.

What are the Impacts of Landslides?

- **Human Life and Safety:** Fast-moving landslides are particularly **deadly**, and slow-moving landslides, though less deadly, can still cause significant damage to **property over time**.
- **Damage to Infrastructure:** **Roads, rail lines, pipelines, and communication lines** can be blocked or severely damaged, disrupting essential services.
 - Landslides can **bury homes**, leading to loss of life and property.
- **Cascading Effects:** A landslide can **block streams**, forming a debris dam. If the dam bursts, it can cause **downstream flooding**, further increasing damage.
- **Economic Loss:** **Repairing damaged infrastructure** and providing **humanitarian aid** can be costly. Landslides also **disrupt local economies**, especially in **agriculture and tourism-dependent areas**.
- **Environmental Impact:** Landslides **disrupt ecosystems**, affecting **soil stability and vegetation**, which can exacerbate erosion and soil degradation.

What are the Government Initiatives to Mitigate Landslide Risks in India?

- **National Landslide Risk Management Strategy (2019):** It is a comprehensive approach that includes **hazard mapping, monitoring, early warning, awareness, capacity building, policies, and stabilisation**.

- **Landslide Risk Mitigation Scheme (LRMS):** It aims to provide **financial support for landslide mitigation** in vulnerable states, focusing on **prevention, mitigation, and research** on critical landslides.
- **Flood Risk Mitigation Scheme (FRMS):** The scheme includes pilot projects for multi-purpose **flood shelters and flood early warning systems** with digital maps to alert villagers for evacuation.
- **National Guidelines on Landslides and Snow Avalanches:** **NDMA** guidelines cover **hazard assessment, risk management**, structural and non-structural measures, institutional mechanisms, financial arrangements, and community involvement.
- **Landslide Atlas of India:** Created by **NRSC** under **ISRO**, it **records landslide events** in vulnerable areas, featuring damage assessments and offering valuable insights on landslides in India.

Committees to Conserve Landslide Prone Western Ghats

- **Western Ghats Ecology Expert Panel, 2011 (Headed by Madhav Gadgil):** The entire Western Ghats should be declared **Ecologically Sensitive Areas (ESA)** with restricted development in graded zones.
 - Classify the Western Ghats into **ESA 1, 2 and 3** with **ESA-1** having a high priority where almost all developmental activities are restricted.

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Note:

- **Western Ghats Ecology Authority (WGEA)** to be constituted as a **statutory authority** under the **Ministry of Environment, Forest and Climate Change**, under the **Environment (Protection) Act, 1986**.
- The report was **criticised** for being **more environment-friendly** and not in tune with the ground realities.
- **Kasturirangan Committee, 2013:** Instead of the total area of Western Ghats, **only 37%** of the total area to be brought under **ESA**.
- **Complete ban on mining, quarrying, and sand mining** in ESAs, with **no thermal power projects** allowed and **hydropower projects** permitted only after a **detailed study**.

What Measures can be Taken to Prevent Landslides Hazards?

- **Engineering Solutions:**
 - **Slope Stabilization:** Uses **retaining walls, rock bolts, soil nails, and ground anchors** to prevent soil and rock movement.
 - Combine plants with engineering methods, such as **brush layering and live crib walls**, to stabilize slopes using natural elements.
 - **Grading and Terracing:** **Modifying the slope and gradient** can reduce instability, while **terracing** creates **level surfaces** on steep areas.
 - **Drainage Systems:** Installs **channels, pipes, or culverts** to control water flow, reducing pore pressure and maintaining soil strength.
 - **Soil Reinforcement:** Uses geotechnical materials like **geotextiles and geogrids** to reinforce slopes, enhancing stability and preventing landslides.
- **Natural Solutions:**
 - **Vegetation Control:** Planting **trees, shrubs, and grasses** binds soil, absorbs excess water, reduces erosion, and intercepts rainfall to lower landslide risks.
 - Organic or inorganic **mulch retains soil moisture**, prevents erosion, and stabilizes slopes by reducing rainfall impact.

- **Water Management:** Techniques like **contouring, and rain gardens** slow water runoff, encourage infiltration, and reduce slope instability.
- **Early Warning Systems:** Install instruments like **inclinometers** to measure **slope stability** and provide early warnings.
 - Monitoring **rainfall intensity** and **cumulative rainfall** helps identify landslide triggers.
 - Technologies like **LiDAR and satellite imagery** detect ground movements and surface changes signaling potential landslides.
- **Best Land Use Practices:** **Avoiding altering slopes, limiting impervious surfaces**, designing proper drainage systems, and implementing erosion control measures are crucial to stabilize slopes and reduce runoff.

Earthquake in Tibetan China and Nepal

Why in News?

A magnitude 7.1 **earthquake** struck the **Tibetan region of China** and **parts of Nepal**, causing widespread devastation. The quake's epicenter was in **Tingri County, within the Lhasa Terrane**, near the **Mt Everest region**.

- This event aligns with findings from research identifying the **Qixiang Co Fault, a newly discovered tectonic fault** facilitating the eastward movement of the Tibetan Plateau, thereby increasing seismic activity in the region.

What are the Causes of Earthquake in Lhasa Terrane?

- **Tectonic Plate Activity:** The earthquake is a result of the ongoing collision between the **Indian and Eurasian plates**, which began around 50 million years ago.
 - The Indian plate continues to push into the **Eurasian plate** at a rate of about **60 mm per year**, causing tension to build up and eventually leading to earthquakes.
- **Historical Context:** Since 1950, more than 21 earthquakes of magnitude 6 or higher have been recorded in the **Lhasa terrane**.

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Note:

- The strongest of these was in 2017 near Mainling, Tibet Autonomous Region of China, with a magnitude of 6.9.

Indian Tectonic Plate

- Around 200 million years ago, during the breakup of the **supercontinent Pangaea**, the Indian plate, once part of **Gondwana**, began drifting northwards at 9 cm per year.
- This movement led to a collision with the **Eurasian Plate**, resulting in the uplift of the **Himalayan mountain range**, a process that continues today.
- The Indian plate moves northeast at approximately 5 per year, driving Himalayan growth by underthrusting the Eurasian Plate.
- The Indian Plate is bordered by the **Eurasian Plate to the north**, the **Australian Plate to the south-east**, the **African Plate to the south-west**, and the **Arabian Plate to the west**.

What is the Significance of Lhasa Terrane?

- **Lhasa Terrane:** The earthquake occurred in the Lhasa terrane, this region is home to large-scale infrastructure projects, including **China's world's largest hydroelectric dam**, which is being built on the **Yarlung Tsangpo River**.
- The Yarlung Tsangpo River enters India as the **Siang** and later the **Brahmaputra**. This raises concerns in India regarding the potential impact on **water flow in Arunachal Pradesh and Assam**.
 - In 2004, a landslide in Tibet created a **glacial lake** that nearly flooded the Sutlej River, prompting India to monitor the situation closely.
- **Environmental Risks:** The Tibetan plateau holds significant water resources and is referred to as the '**third pole**' due to its **glaciers, rivers, and lakes**.
- Earthquakes in the area can destabilize glaciers and change the course of rivers, increasing the risk of flooding.

What is the Qixiang Co Fault?

- **Geological Characteristics:** The QXCF is a **sinistral fault (left-lateral fault)**, meaning the blocks on either side of the fault move laterally in a left-handed direction relative to each other.

- **Significance in Tectonic Dynamics:** The QXCF serves as the most significant tectonic boundary across the **Qiangtang Terrane**, a major geological feature of the **Tibetan Plateau seismic zone** (one of China's five major seismic zones)
 - The QXCF helps central Tibet move eastward, adding to the region's complex changes caused by the collision of the Indian and Eurasian tectonic plates.
 - QXCF dynamics **may influence the frequency and intensity of earthquakes** in the area.

Why is the Himalayan Zone Seismically Active?

- **Tectonic Plate Convergence:** The Himalayas are the result of the collision between the Indian and Eurasian tectonic plates which are still converging at a rate of **40-50 mm/year**, causing constant tectonic stress and leading to seismic activity.
- **Continual Plate Subduction:** The Indian plate is being **continuously subducted beneath the Eurasian plate**, generating **strain** that is released through frequent earthquakes.
- **Presence of Fault Lines:** The region is crisscrossed by multiple fault lines, including the **Main Himalayan Thrust**, that are responsible for frequent seismic events.
 - These faults **store elastic energy that**, when released, causes earthquakes.
- **Complex Tectonic Interactions:** Besides the India-Eurasia collision, other tectonic features, such as the **subduction of the Eurasian plate beneath the Pamir Mountains**, also contribute to the region's seismicity.
 - This convergence of various tectonic forces increases the likelihood of earthquakes.

What is an Earthquake?

- **About:** An earthquake is the shaking of the Earth's surface caused by the **release of energy, generating seismic waves**.
 - These waves travel in all directions and are recorded on **seismographs**. The starting point beneath the surface is the **hypocenter**, and the point directly above it on the surface is the **epicenter**.

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Note:

➤ Types of Earthquakes:

There are four different types of earthquakes they are tectonic, volcanic, collapse and explosion.

- A **tectonic earthquake** occurs when the **Earth's crust breaks** due to geological forces acting on rocks and adjacent plates, leading to physical and chemical changes.
- A **volcanic earthquake** is triggered by **volcanic activity**, typically due to the movement of **magma within a volcano**.
- A collapse earthquake occurs in underground **caverns or mines**, caused by seismic waves from **surface explosions**. These earthquakes are **usually minor tremors**.
- An **explosion earthquake** is an earthquake that is the result of the **detonation of a nuclear and/or chemical device**.

- **Earthquake in India:** India is divided into four seismic zones by the **Bureau of Indian Standards**: II, III, IV, and V. **Zone V is the most seismically active**, while **Zone II is the least**.
- The **Indian Himalayan Region**, being geologically active, primarily falls within Seismic Zones IV and V.

EARTHQUAKE

ABOUT

- Shaking of the earth; caused due to release of energy, generating **seismic waves in all directions**

HYPOCENTER

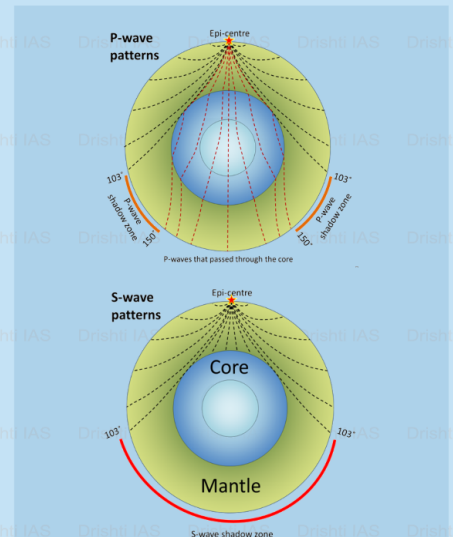
- Location where the earthquake starts (below earth's surface)

EPICENTER

- Location right above the Hypocenter (on the earth's surface)

EARTHQUAKE WAVES

- **Body Waves:** Move in all directions travelling through the body of the earth
 - **P Waves:** Move faster, First to arrive at surface, Similar to sound waves, Travel through gaseous, liquid and solid materials
 - **S Waves:** Arrive at surface with some time lag, Travel only through solid materials
- **Surface Waves:** Last to report on seismographs, More destructive, Cause displacement of rocks
 - **Love Waves:** Same motion as S-waves (horizontal) without vertical displacement, Sideways motion perpendicular to the direction of propagation, Faster than Rayleigh waves
 - **Rayleigh Waves:** Cause the ground to shake in an elliptical pattern, Spread out the most of all seismic waves, Move vertically and horizontally in a vertical plane



CAUSES OF EARTHQUAKES

- **Release of energy along a Fault/Fault Zones** (break in the crustal rocks)
- Movement of **tectonic plates (most common)**
- **Volcanic eruption** (stress changes in rock-injection/withdrawal of magma)
- **Human activities** (mining, explosion of chemical/nuclear devices etc.)

MEASURING EARTHQUAKE

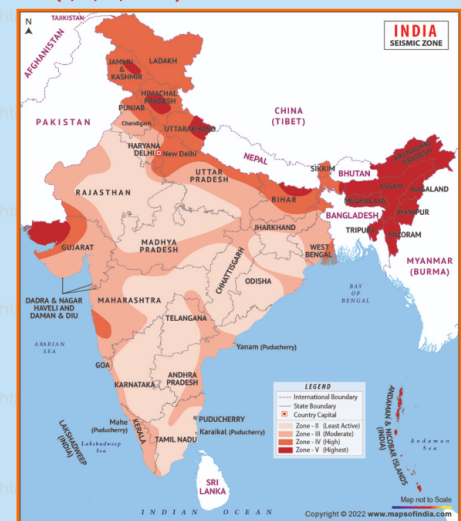
- **Seismometers** - Measures seismic waves
- **Richter Scale** - Measures magnitude (energy released; range: 0-10)
- **Mercalli** - Measures intensity (visible damage; range: 1-12)

DISTRIBUTION

- **Circum-Pacific Belt** - 81% of earthquakes
- **Alpide Earthquake Belt** - 17% of the largest earthquakes
- **Mid-Atlantic Ridge** - Mostly submerged underwater

EARTHQUAKE IN INDIA

- India is **one of the highly earthquake affected countries** due to the presence of technically active mountains - the Himalayas.
- India has been divided into **4 seismic zones (II, III, IV, and V)**



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Note:

La Nina: Impacts, Mechanisms, and Predictions

Why in News?

The long-anticipated **La Nina** has emerged, but the **Pacific Ocean's** cooling is **mild** and unlikely to cause as many weather problems as usual.

- Its **delayed arrival** may have been influenced by the **world's oceans being much warmer** than the last few years.
- La Nina conditions emerge in the **tropical Pacific in December**.

What is La Nina?

- **About:** La Niña, meaning “The Little Girl” in Spanish, is a **cool phase of the El Nino Southern Oscillation (ENSO)**.
 - It is characterized by **colder-than-normal sea surface temperatures** in the eastern Pacific Ocean.
 - La Nina is one of the three phases of ENSO, alongside **El Nino (the warm phase)** and the **neutral phase**.
- **Mechanism:** In La Nina, the **trade winds strengthen**, pushing **warm water** toward the **western Pacific**.
 - **Cooler waters** from below **rise in the eastern Pacific**, causing a **temperature drop** in that region.
- **Cycles:** La Niña occurs in **irregular cycles**, typically lasting from **two to seven years**, and often follows an El Nino event.
- **Recent Events:** The most recent La Nina phase lasted from **2020 to 2023**, before transitioning to an El Nino phase in mid-2023.
- **Climate Change:** The **intensity** of La Nina's impacts, such as **extreme temperatures and unusual weather**

patterns, is exacerbated by anthropogenic climate change.

What are the Potential

Regional Impacts of La Nina?

- **Asia:** In India, La Nina is expected to lead to **above-average monsoon rainfall** from **July to September**, which may result in a **decrease** in the production of **pulses** in the Indo-Gangetic Plains, but **rice production** may see an **increase**.
 - In Southeast Asia, including **Indonesia, Malaysia, and the Philippine**, La Nina brings **above-average rainfall**, causing **floodings** but boosting rice and **palm oil production**.
- **South America:** In Southern **Brazil, Uruguay, northern Argentina, and southern Bolivia**, La Nina causes **below-average rainfall**, leading to **drought** and affecting soybeans and maize.
 - In contrast, **Northern Brazil, Colombia, Venezuela, and parts of Ecuador and Peru** experience wetter conditions, leading to potential **floodings**.
- **Africa:** In East Africa, La Nina brings **drier conditions** in December and January, negatively impacting crops harvested in **February and March**.
 - In **Southern Africa**, La Nina causes **above-average summer rainfall**, benefiting agriculture with higher yields of **maize, sorghum, wheat, and soybeans**.
- **Oceania:** In Australia, the region experiences **above-average rainfall in the northern and eastern regions**, often linked to **severe floodings**.
- **North America:** In the US, La Nina causes **drier conditions in the south and wetter, stormier weather in the north**, including Alaska and Canada.

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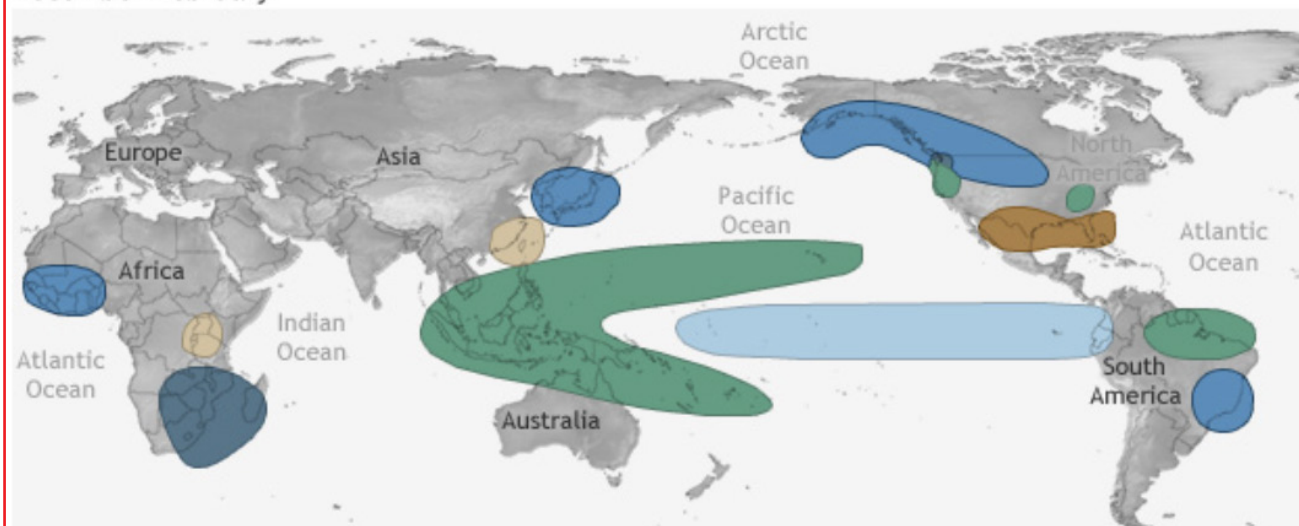


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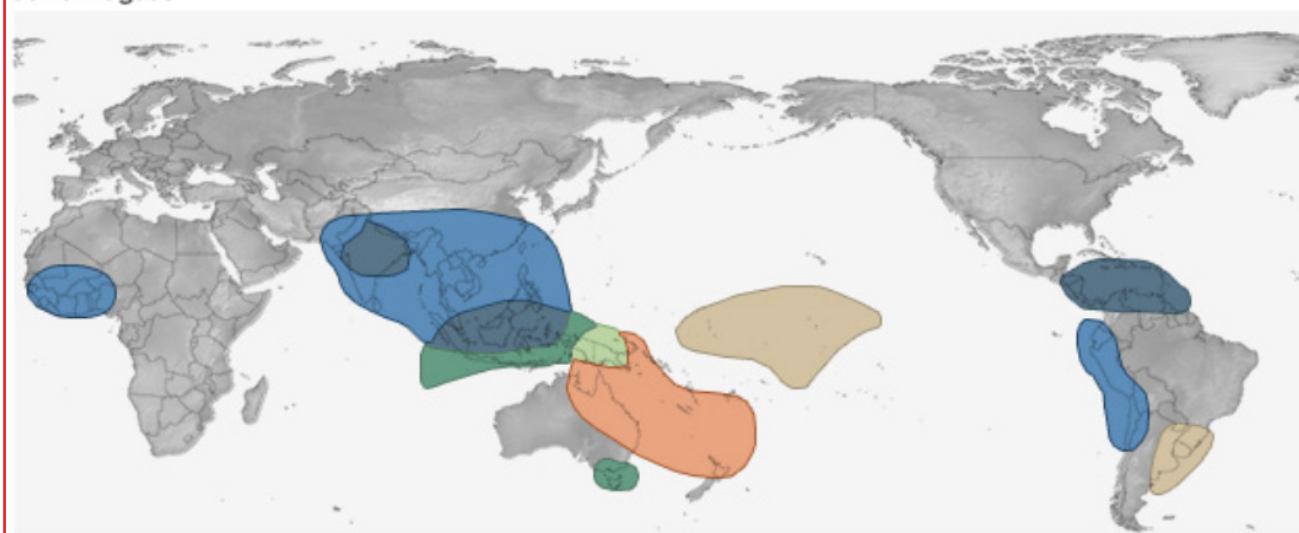


Note:

December-February



June-August



NOAA Climate.gov

What is El Nino-Southern Oscillation?

- **About:** ENSO is a **recurring climate pattern** involving **periodic changes** in the temperature of waters in the **central and eastern tropical Pacific Ocean**, affecting global weather patterns.
- **Historical Context:** The term El Nino was used by South American fishermen for **warm Christmas waters**.
 - **Sir Gilbert Walker** discovered the **Southern Oscillation**, linking sea pressure changes to atmospheric conditions in the **1960s**, leading to the **ENSO term**.
 - **La Nina and Neutral** became widely used in the **1980s**.

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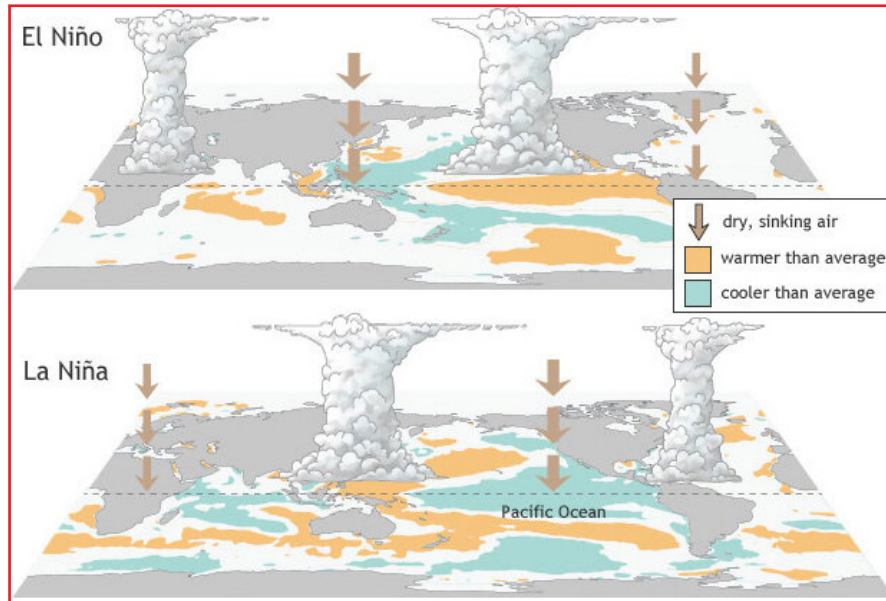
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Note:

➤ **Phases of ENSO:**

- **El Nino:** Warming ocean temperatures in the central/eastern Pacific, weakens **easterly winds**, reducing rainfall in Indonesia and increasing it in the central/eastern Pacific.
- **La Nina:** Cooling ocean temperatures in the central/eastern Pacific, **strengthens easterly winds**, increasing rainfall in Indonesia and decreasing it in the central/eastern Pacific.
- **Neutral:** Tropical Pacific sea surface temperatures are **average**, with atmospheric conditions showing signs of **either El Nino or La Nina**.



- **ENSO Cycle:** The ENSO cycle oscillates **every 3 to 7 years**, with sea surface temperatures varying between **1°C to 3°C above or below average**.

How La Nina and El Nino are Predicted?

- **Climate and Observational Data:** Scientists use **climate models** alongside observational data (such as **sea surface temperatures, trade wind strength, and data from satellites and ocean buoys**) to predict the onset of ENSO events (El Nino and La Nina).
 - **Ocean buoys** are **floating devices** placed in the ocean for various purposes, including **environmental monitoring, data collection, and navigation**.
- **Oceanic Nino Index: ONI** It compares the **3-month average sea surface temperatures** in the East-Central Tropical Pacific with the **30-year average**.
 - When the difference between the **two is 0.5° C or higher**, it is an El Nino, and when it is **-0.5° C or lower**, it is a La Nina.
- **Nino-3.4 Index:** This index **helps to identify the thresholds** that define El Nino and La Nina events.

- A value of **0.5°C or greater** is indicative of the **event's initiation**, while a **strong event** requires a temperature anomaly of **1.5°C or more**.

- **Lead Time for Predictions:** La Nina events can be forecasted up to **two years in advance** if they follow a strong El Niño.

Polar Vortex

Why in News?

A severe **winter storm** has affected a large part of the US, impacting over 60 million people across 30 states.

- This extreme weather is attributed to the **southward expansion of the polar vortex**, highlighting its role in causing frigid temperatures and severe storms.

Note: Winter storms are weather events characterized by **extreme cold, snow, sleet, or freezing rain**, often accompanied by strong winds.

- They form when **moist air rises, cools, and condenses into precipitation**, with cold temperatures ensuring it falls as snow or ice.

What is the Polar Vortex?

- **About:** The polar vortex is a large area of **low-pressure and cold air** that rotates around the **Earth's polar regions**.
 - The term "**vortex**" describes the **counter-clockwise flow of air** that confines colder air near the poles.

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Note:

- Polar Vortex exists year-round, but it weakens in summer and strengthens in winter.

➤ **Types:**

- **Tropospheric Polar Vortex:** Located at the lowest layer of the atmosphere, from the **surface up to 10-15 km**, where most weather phenomena occur.
- **Stratospheric Polar Vortex:** Occurs higher up, between **15 km to 50 km**, and is **strongest during autumn**, disappearing in the summer.
 - Its changes are influenced by **air movement and heat transfer in the polar region**. During autumn, circumpolar winds accelerate, strengthening the vortex and forming a unified, rotating mass of polar air in the **stratosphere**.

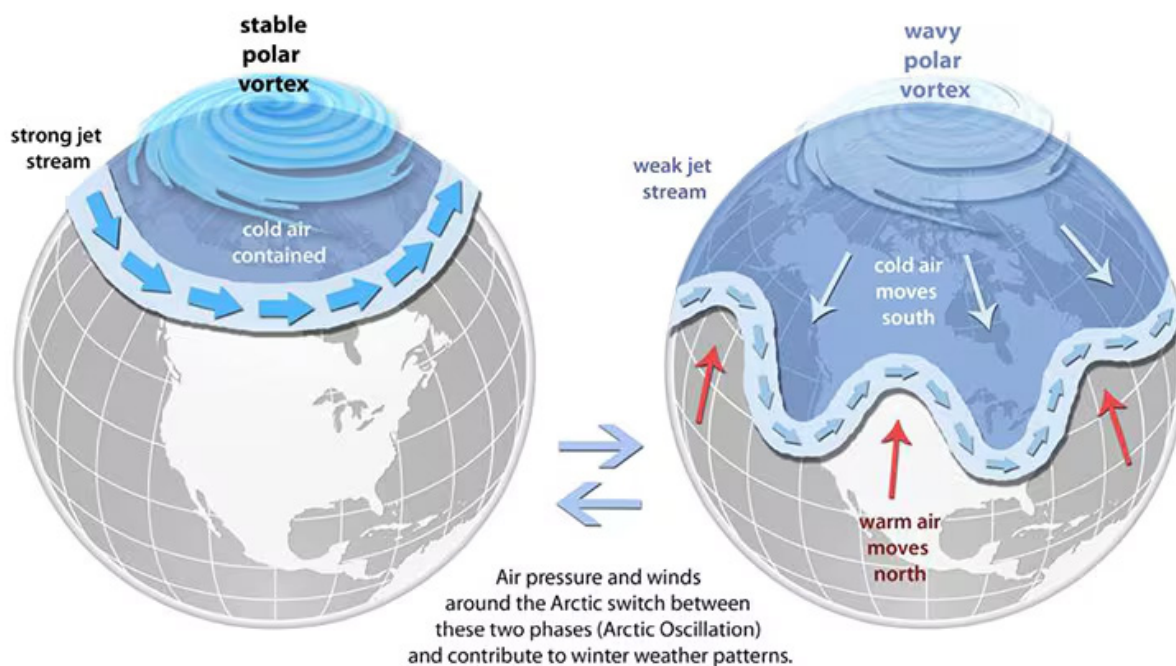
- **Mechanism of Extreme Cold:** When the **polar vortex is strong**, it keeps the jet **stream stable**, preventing cold air from moving south.

- However, when the **vortex weakens**, a disrupted jet stream (a narrow band of strong winds), which usually moves in a straight line, becomes wavy, allowing Arctic air to flow farther south.

- This disruption leads to **extremely low temperatures, severe storms, and extreme weather**, including snowfall and freezing rain.

- **Global Warming and Polar Vortex:** Researchers state that the Arctic is warming faster than the rest of the planet, a phenomenon known as **Arctic amplification**.

- This reduces the **temperature gradient** (rate of change of temperature) **between the poles and the mid-latitudes**, weakening the **polar vortex**.



Other Geophysical Phenomenon Similar to Polar Vortex

- **Arctic Oscillation (AO):** It is a climate pattern affecting **winter weather in the Northern Hemisphere**. When the Arctic Oscillation (AO) is **positive**, a strong jet stream directs storms north, **limiting cold air outbreaks in the mid-latitudes**, while the **negative phase shifts the jet stream south**, causing cold outbreaks and storms.

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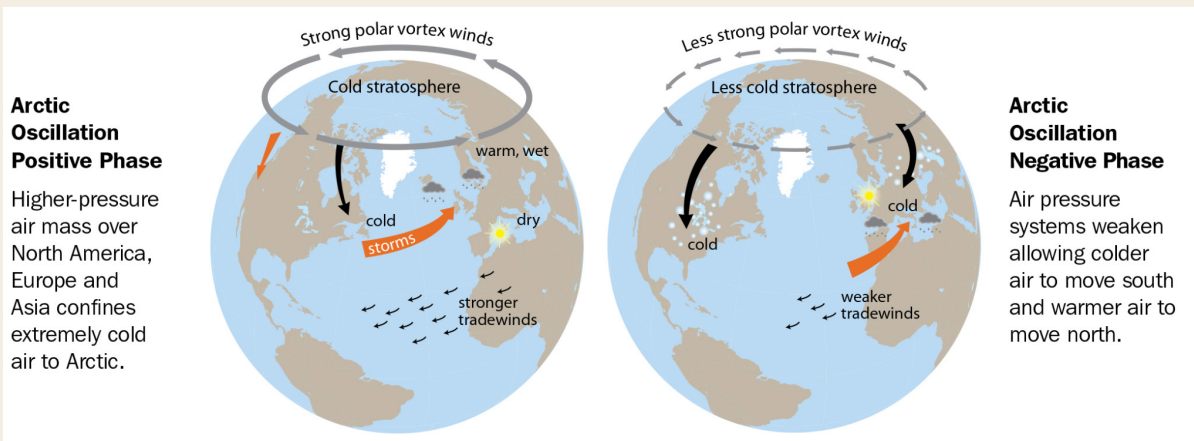
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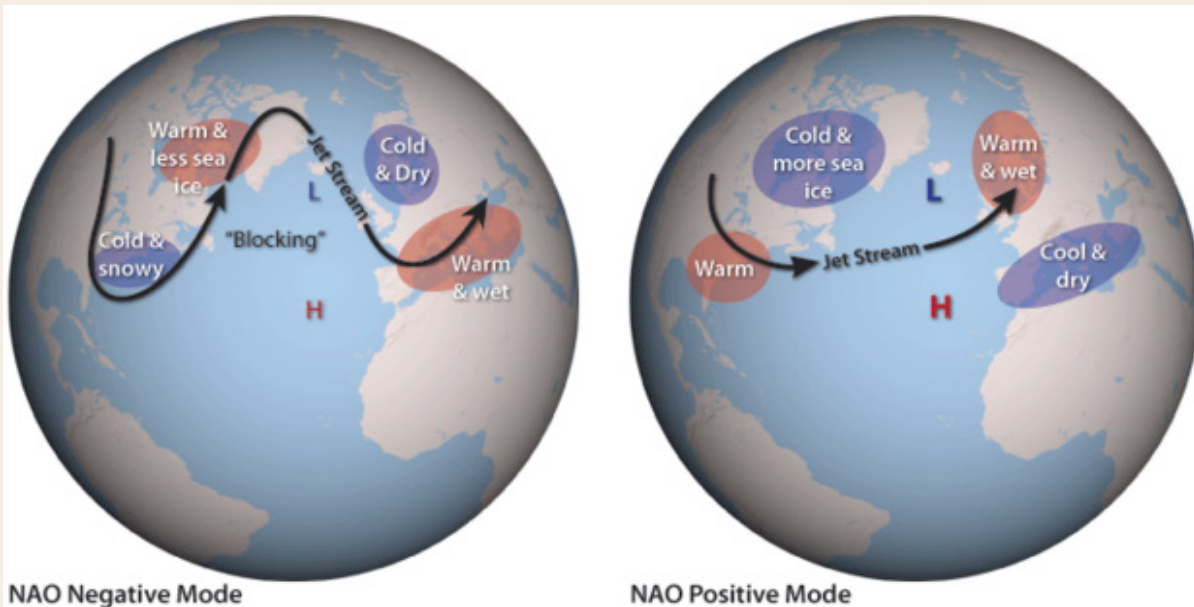
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Note:



- **North Atlantic Oscillation (NAO):** The **NAO** measures pressure differences between the **Azores High** and **Subpolar Low**, affecting weather patterns in North America and Europe.
 - The positive phase of NAO brings warmer, wetter conditions in the US and northern Europe, while the negative phase causes cooler, drier conditions.



Climate Change and African Easterly Waves

Why in News?

A study published in *Communications Earth & Environment* predicts that **climate change** will increase the intensity and frequency of **extreme flooding in the Sahel region**, driven by changes in **African easterly waves (AEWs)**.

What are the Key Highlights of the Study?

- **Increased AEW Activity:** The study predicts an increase in AEWs over the **Sahel-Sahara** by the end of 21st century.

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Note:

- The intensification is driven by **increased baroclinicity** (variation in **atmospheric pressure and density** with height) due to a **stronger meridional temperature gradient** (difference in temperature between regions) between the Guinea Coast and the Sahara.
- **Enhanced Monsoon Flow:** The study found that **low-level warming reinforces monsoon flow**, increasing **convergence** (more air entering a vertical column than leaving it) and vertical motion of air along the **intertropical discontinuity (ITD)** altering AEWs formation.
- The ITD is the boundary between the **hot and dry desert air** and the **cooler and more moist air** from the Arabian Sea.
- **Implications:**
 - **Saharan Dust Transport:** Strong winds from a northern track AEW (close to Sahara Desert) can transport **dry Saharan air**, **preventing or delaying tropical cyclogenesis** (the formation of tropical

cyclones) until more favorable conditions in the warmer western Atlantic.

- **Connection to MCSs:** AEWs are linked to **Mesoscale convective systems (MCSs)**, which cause extreme rainfall. The study suggests that increased AEW activity may **lead to more frequent and intense flooding events** in the Sahel.

What are African Easterly Waves?

- **Definition:** African easterly waves (AEWs) are weather systems that form over **northern Africa** during the summer and move **east to west toward the Atlantic Ocean**.
- **Significance:** AEWs bring rainstorms to drought-prone areas in northern Africa.
 - Carry **Saharan dust across the Atlantic ocean** and AEWs act as precursors for **Atlantic hurricanes**.
- **Influence:** AEWs significantly affect the **regional hydroclimate**, particularly in the Sahel, making it essential to understand their behavior under global warming.



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Note:

Sahel Region

- The Sahel is a semiarid region of **western and north-central Africa**, stretching from Senegal in the west to Sudan in the east.
 - It acts as a transition between the **Sahara Desert** to the north and the humid **savannas to the south**.
 - It features **savanna terrain, with low-growing grass, thorny shrubs**, and sparse vegetation.
- The **United Nations (UN)** limits the Sahel to **ten (10) countries** they are Burkina Faso, Cameroon, The Gambia, Guinea, Mali, Mauritania, Niger, Nigeria, Senegal and Chad.
- The **Niger River**, the longest and largest in western Africa, is a major water source for the region.

Boundaries of the Sahel within the context of the United Nations



Artesian Well in Rajasthan and Tethys Sea

Why in News?

Recently, large amounts of **water** began **gushing out** from underground in **Jaisalmer, Rajasthan** that is attributed to the **Artesian Well** in India.

- Experts **rejected** the idea of the water being **linked** to the ancient **Saraswati river**, suggesting water may be **millions of years old**, with origins from **Tethys sea** (pre-Vedic times).

What is an Artesian Well?

- **About:** An artesian well is a type of well in which **water rises naturally to the surface** under pressure without the need for pumping. This occurs when **water is trapped** in a **confined aquifer** and is under significant pressure.
 - It is also described as “confined” water because of **hardy materials above and below it**.

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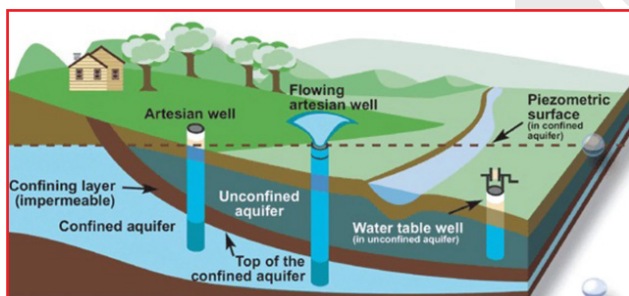


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Note:

- **Formation:** Artesian wells are formed when a **well penetrates a confined aquifer**, which is a layer of **permeable rock** or **sediment** sandwiched between impermeable layers like clay or rock.
- **Pressure Mechanism:** The water in the confined aquifer is **under pressure** due to the **weight of the water above** it, and when the well is drilled, the pressure forces the water to rise through the **borehole**.
- **Water Flow:** In an artesian well, the water may **flow freely to the surface** if the pressure is sufficient, which is known as **"flowing artesian wells."**
 - If the **pressure is not enough** to force the water to the surface, it can be **extracted using a pump**.
- **Locations:** Famous artesian wells are found in regions such as the **Great Artesian Basin in Australia**, **Dakota aquifer** in the United States, and **Africa**.
- **Difference with Tube Wells:** Artesian water can **naturally rise to the surface** on its own and is **found deeper** beneath the earth's surface whereas **tube wells require external power** to pump water.



Note: The name **Artesian** comes from the town of **Artois** in France, the old Roman city of **Artesium**, where the best known flowing artesian wells were drilled in the Middle Ages.

What are the features of Artesian Well Found in Rajasthan?

- **Water Eruption:** In desert regions of Rajasthan, water is **confined underneath** a geological layer of **sandstone**.
 - As soon as the top layer is **punctured**, water starts flowing upwards due to heavy pressure, often gushing out like a **fountain**.

- **Ancient Sea Evidence:** The water found in the borewell exhibited **high salinity** that is similar to that from **ancient sea or saline groundwater sources**.
 - The water is believed to be linked to the **Tethys Sea**, which existed **around 250 million years ago**.
- **Presence of Marine Clay:** Along with the water, **Oozes (fine white marine clay having skeletal remains)** surfaced, further supporting the idea that the groundwater is remnants of an **ancient sea**.
 - The sand found in the area, believed to be from the **Tertiary period (around 6 million years ago)**, was also brought up with the groundwater.
- **Geological Significance:** The Jaisalmer region once **bordered the Tethys Sea**, with **dinosaurs** inhabiting one side and deep waters on the other.
 - **Giant shark fossils** have been found only in India (Jaisalmer), Japan, and Thailand in Asia.

What are the Key Facts About the Tethys Sea?

- **About:** The Tethys Sea formed during the early stages of the **Mesozoic Era**, particularly during the **Triassic period** (about 250 to 201 million years ago).
 - It was located between the landmasses of **Gondwana** (the southern supercontinent) and **Laurasia** (the northern supercontinent).
 - Gondwanaland incorporated present-day **South America, Africa, Arabia, Madagascar, India, Australia, and Antarctica**.
 - Laurasia included **North America, Europe, and Asia (except peninsular India)**.
- **Geographic Extent:** The Tethys Sea extended across what is now parts of **Europe, Asia, Africa, and the Middle East** and connected the **Pacific Ocean** in the east and the **Atlantic Ocean** in the west.
- **Closure:** By the **Late Cretaceous** (around 66 million years ago), the Tethys Sea began to close as the **tectonic plates** continued to shift.
 - The remnants of the Tethys Sea can still be seen today in the form of smaller seas, like the **Mediterranean Sea, Caspian Sea, and Black Sea**.

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Note:

- **Tectonic Significance:** The gradual closure led to the creation of new landmasses, such as the **Indian subcontinent** moving toward the **Asian plate**, leading to the uplift of the **Himalayan mountain range** and the **Tibetan Plateau**.
- **Fossil Evidence:** The Tethys Sea is known for being home to a rich diversity of marine life, including early forms of **sharks, ammonites, and marine reptiles** like **ichthyosaurs** and **mosasaurs**.
 - The Tethys Sea's evolution helped form **petroleum basins** in North Africa and the Middle East, aiding **organic material accumulation and hydrocarbon maturation**.



What are Other Examples of Underwater Gushing on the Surface?

- **Hydrothermal Vents:** They are **underwater hot springs** found near the **tectonic plates**, where hot **water and minerals** from beneath the Earth's crust are expelled into the **ocean**.
- **Hot springs:** Hot springs on land are areas where **heated groundwater** (heated by geothermal heat from Earth's interior) emerges at the surface.
 - E.g., **Manikaran** (Himachal Pradesh), **Gaurikund** (Uttarakhand).
- **Geysers:** These are geothermal features that **periodically eject water and steam** due to underground heating.
 - When heated by **nearby magma**, the water flashes into steam, causing an eruption of hot water and steam. E.g., **Yellowstone National Park (US)**.
- **Mudpots:** These are the **bubbling pools of mud** that form in geothermal areas. They are formed when limited **geothermal water mixes with mud and clay**.
- **Fumaroles:** Fumaroles occur when **magma passes through the water table**, heating the water and causing steam to rise, carrying volcanic gases like **hydrogen sulfide (H₂S)** to the surface.
 - It is often found near **"dying volcanoes"** where magma deep underground has solidified and cooled. E.g., **Barren Island** (Andaman and Nicobar Islands)

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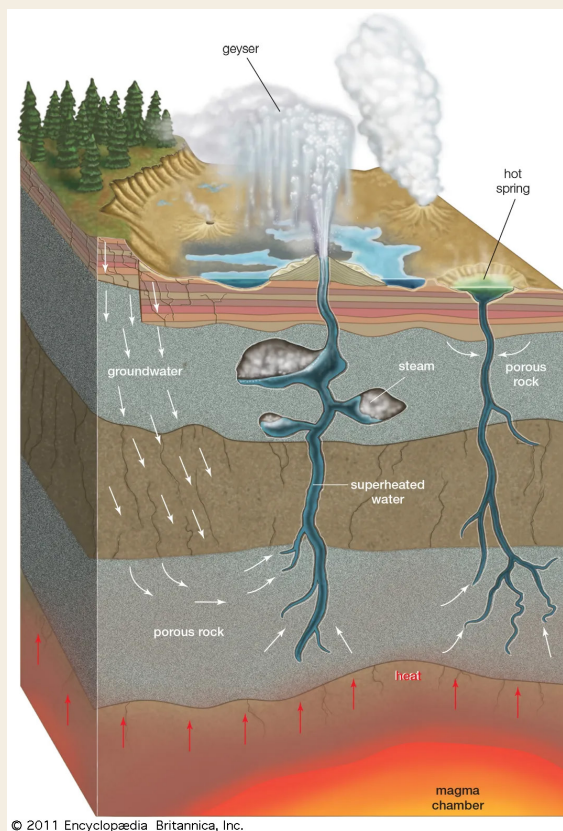
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Note:



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Saraswati River

- **About:** It is a river mentioned in ancient Indian texts, primarily the **Vedas** in which the Saraswati river is considered the **holiest and mightiest** river of the **Vedic Period** [(8000-5000 years before present (BP))].
- **Origin and Course:** It originated in the **Himalayas** and flowed through the regions of **Punjab, Haryana, Western Rajasthan**, and **Gujarat** between the **Indus river** in the west and the **Ganges river** in the east.
 - The river eventually drains into the **Gulf of Kachchh** in the **Arabian Sea**.
- **Disappearance:** The Saraswati river **disappeared around 5000 BP** due to **climatic** and **tectonic changes**.
 - It is believed that the river still flows underground beneath the **Thar Desert** and retains its **Himalayan connectivity**.
- **Mention in Ancient Literature:** The **Saraswati River** is mentioned frequently in ancient texts like the **Vedas, Manusmriti, Mahabharata**, and **Puranas**.
 - **Vedas:** The Saraswati is called the **"Best of Mothers," "Rivers,"** and **"Goddesses,"** with the Rigveda highlighting its importance and the **Yajurveda** mentioning its **tributaries**.
 - **Manusmriti:** The area between the **Saraswati and Drishadvati river** (seasonal river in Haryana) is regarded as **Brahmavarta**, created by God.
 - **Mahabharata:** Mentions **pilgrimage sites** along the river and its disappearance into desert sand at **Vinasana** (place where the Saraswati river disappeared) due to low water discharge.
 - **Puranas:** The **Markandeya Purana** describes the Saraswati rising from the **Plaksha tree (Pipal tree)** with a sage worshipping its rise.



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Note:

Security

Highlights

- India-US Initiatives in Defence and Nuclear Cooperation
- 2025 as Year of Reforms for Defence Force
- Suicide Among CAPF Personnel

India-US Initiatives in Defence and Nuclear Cooperation

Why in News?

The US [National Security Advisor](#) visited India and signed **new initiatives** in areas such as technology and defence.

What are the new initiatives signed between India and the US?

- **Civil Nuclear Cooperation:** US announced to **remove restrictions** e.g., supply of **US nuclear reactors** on Indian nuclear entities like [Bhabha Atomic Research Center \(BARC\)](#) to implement [India-US civil nuclear cooperation agreement](#).
- **Sonobuoy Co-Manufacturing:** It aims to bolster the Indian Navy's **underwater threat detection capabilities**, particularly in detecting submarines and other hostile underwater objects.
- **Missile Export Control:** The US NSA briefed India on updates to **missile export controls** under the [MTCR](#), enhancing **space cooperation** and creating new collaboration opportunities.
 - India became a member of the **MTCR** in 2016.
- **Advancement of [iCET](#):** Both nations reaffirmed cooperation in emerging technologies such as **artificial intelligence, quantum computing, telecommunications, and space**.

Note: India and the US decided to **curb terrorism** through 'de-radicalisation' of vulnerable communities.

What are Sonobuoys?

- **About:** Sonobuoys are **expendable, electro-mechanical acoustic sensors** designed to detect, classify, and track underwater sounds from ships and submarines.
 - They are primarily used in **anti-submarine warfare (ASW)**.
- **Functioning:** They are dropped in **canisters**, activate upon hitting water, and deploy an **inflatable system** with a **radio transmitter** on the surface.
 - They remain active for around **24 hours** and are designed to **operate only once**.
- **Communication:** The inflatable system on the surface of the water **maintains communication** with the **ship or aircraft** tracking the sonobuoy.

India-US Civil Nuclear Cooperation Agreement

- **About:** Also known as the **123 Agreement**, it allows India to **access nuclear fuel, technology, and reactors** for peaceful purposes like energy generation, even though India is **not** a signatory to the [Nuclear Non-Proliferation Treaty \(NPT\)](#).
- **Key Components:** India agreed to place its **civilian nuclear facilities** under [IAEA](#) safeguards to ensure peaceful use of nuclear material.
 - The US sought a **NSG exemption** to enable trade with India's expanding peaceful nuclear sector.

Suicide Among CAPF Personnel

Why in News?

The [Central Industrial Security Force \(CISF\)](#) has successfully **reduced** its suicide rate by **40%**, from **25 deaths in 2023 to 15 in 2024**.

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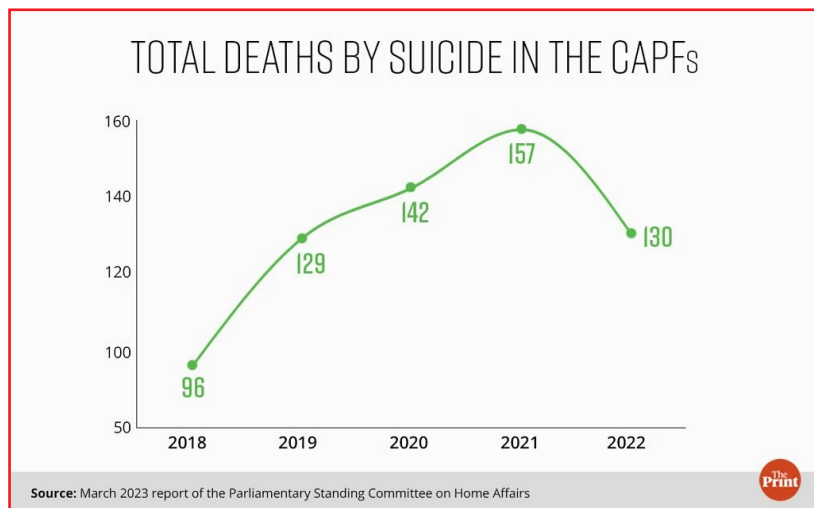


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Note:

- According to data from the **Ministry of Home Affairs (MHA)**, 654 **Central Armed Police Forces (CAPF)** personnel died by **suicide** between 2018 and 2022.
 - There were **230 suicides** in the **CRPF**, 174 in the BSF, 89 in the CISF, 64 in the SSB, 54 in the ITBP, 43 in the Assam Rifles, and **3** in **NSG**.



Note: According to **National Crime Records Bureau (NCRB)** data 2022, the **national suicide rate** stood at **12.4 per lakh** in 2022.

- The suicide rate is the number of **suicides per 1,00,000 people** in a given population.

What are the Reasons for Suicide Among CAPFs?

- **Stressful Deployments:** Personnel are often stationed in hostile regions such as **Naxal-affected areas** and conflict zones like **Jammu and Kashmir** without sufficient breaks.
 - **Lack of “peace postings”** akin to the Army exacerbates mental fatigue.
 - Peace postings means stationing of troops in **relatively stable and non-hostile environments**, as opposed to conflict zones or high-tension areas like borders or insurgency-affected regions.
- **Family Separation:** Long durations away from families result in **emotional strain** and difficulties in addressing family issues like **land disputes or financial management**.
 - More than **80% of troops** those who died by suicide were reported after they **returned home from leave**.

- **Mental Health Challenges:** Seeking psychological help is **stigmatized** in the forces, with limited mental health support systems.
 - Suicide attempts are **lower among female personnel**, as males often avoid sharing problems due to fear of peer ridicule.
 - Many people consider the **Army, Navy, and Air Force** as “real” forces leading to **further demotivation** among the **CAPF troops**.
- **Career Progression Issues:** There is **limited scope for promotions** among CAPFs. Personnel have had to serve in the **same post for as long as 10 years** in some cases.
 - **Higher ranks** are reserved for **IPS officers** and CAPF personnel **feel dejected** contributing to mental stress.
- **Lack of Job Satisfaction:** Army personnel have access to **Army hospitals** in major cities for their **families’ health and treatment**, and their families enjoy a broader selection of products from **Army canteens** compared to CAPF personnel.
 - CAPFs are under the **New Pension Scheme (NPS)** with **lower payouts** compared to the **Old Pension Scheme (OPS)** for armed forces personnel.
- **Access to Firearms:** Easy access to **service weapons** increases the risk of impulsive acts during periods of distress.

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Note:

CENTRAL ARMED POLICE FORCES (CAPF)

The CAPF includes the seven security forces in India functioning under the Ministry of Home Affairs.

Assam Rifles (AR)

- ↳ **Origin:** 1835, as militia called 'Cachar Levy'
 - ↳ **Erstwhile objective:** To protect British Tea estates
- ↳ **Current Objectives:**
 - ↳ Conducting anti-terrorist operations in NER
 - ↳ Ensuring security at India-China and India-Myanmar borders
- ↳ **Imp Role in:**
 - ↳ Sino-India War 1962
 - ↳ Indian Peace Keeping Force (IPKF) to Sri Lanka (1987)

Due to long association with tribal belts, Assam Rifles are also called 'Friends of the North East'

Border Security Force (BSF)

- ↳ **Origin:** 1965
- ↳ **Objectives:**
 - ↳ Securing land borders with Pakistan and Bangladesh
 - ↳ Also performing Anti-Infiltration in Kashmir Valley
 - ↳ Counter Insurgency in NER
 - ↳ Anti-Naxal Operations in Odisha and Chhattisgarh
- ↳ **Wings:** Air wing, marine wing, an artillery regiment, and commando units

BSF is India's First Line of Defence and the world's largest border guarding force

Central Reserve Police Force (CRPF)

- ↳ **Pre-Independence Origin:** 1939 (Crown Representative's Police)
- ↳ **Post Independence:** 1949 - under CRPF Act, became Central Reserve Police Force
- ↳ **Objective:** Crowd control, riot control, counter militancy/insurgency operations, etc.

CRPF is the principle central police force for internal security

Indo-Tibetan Border Police (ITBP)

- ↳ **Origin:** 1962
- ↳ **Objectives:**
 - ↳ Deployed on border from Karakoram Pass (Ladakh) to Jachep La (Arunachal Pradesh) (~3488 km of Indo-China Border)
 - ↳ Manning Border Outposts on altitudes 9000 ft - 18700 ft in Western, Middle and Eastern sectors of Indo-China Border

ITBP is India's specialised mountain force & the first responder to natural disasters

National Security Guard (NSG)

- ↳ **Origin:** 1984 (came into being in 1986), following Operation Blue Star
- ↳ **Objectives:** Counter-terrorism unit/Federal Contingency Force
- ↳ **Task-oriented Force - Two complementary elements:**
 - ↳ Special Action Group (SAG)
 - ↳ Special Ranger Groups (SRG)

Sashastra Seema Bal (SSB)

- ↳ **Origin:** 1963
- ↳ **Objectives:**
 - ↳ Guarding Indo-Nepal and Indo-Bhutan borders
 - ↳ Enhance border security, curb trans-border crimes, prevent unauthorised entry/exit, halt smuggling, etc.

Central Industrial Security Force (CISF)

- ↳ **Origin:** Central Industrial Security Force Act, 1968
- ↳ **Objectives:** Ensuring security of major critical infrastructure installations

CISF is the sole CAPF unit with a specialised fire wing



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Note:

Why Suicide Rate is Higher Among CRPF Personnel?

- **Statistics:** MHA data shows that there were **36 suicides** in the CRPF in **2018**, rising to **40 in 2019**, **54 in 2020**, and **57 in 2021**. The numbers dipped to **43 in 2022**.
- **Over Reliance on CRPF:** State police forces often lack the resources, manpower, and training to handle crises, forcing the CRPF to step in.
 - The CRPF ensures **free and fair elections** and maintains order at events like **Ganesh Chaturthi** in Maharashtra and **Rath Yatra in Odisha**.
 - This **adds to the workload** and **reduces opportunities for rest**.

What are Government Initiatives to Address Suicides Among CAPF Personnel?

- **Task Force Formation:** A task force was set up by MHA in **December 2021** to identify risk factors, prevention strategies, and conduct research on suicides in CAPFs.
 - It has identified **3 main risk factors** contributing to suicides in CAPFs i.e., **working conditions, service conditions, and personal/individual issues**.
- **E-Leave Systems:** The CRPF's **SAMBHAV app** enables personnel to apply for **leave instantly**, with leave approval processed through the **e-leave portal**.
- **Mental Health Support:** The CRPF has brought in **mental health counselors** to support the emotional well-being of troops.
 - In CRPF, **pairs of personnel** are assigned as **"buddies"** to monitor and support each other, acting as an **early warning system** for mental health concerns.
 - **CISF** launched the **Mental Health Championship Program** for supervisors to identify early signs of **mental health issues**.
 - CISF's initiatives are supported by **Project Mann**, a mental health helpline providing **24/7 tele-counseling** and in-person sessions.
 - **BSF** partnered with **AIIMS, New Delhi** to provide counselling services, with dedicated budgets allocated.
- **Family-Centric Interventions:** Cases of depression and mental illness are closely monitored, with efforts to **allow family members to stay with affected personnel**.

2025 as Year of Reforms for Defence Force

Why in News?

Recently, the **Ministry of Defence** has decided to observe **2025 as the 'Year of Reforms'** to transform the Armed Forces into a **technologically-advanced combat-ready force** capable of **multi-domain integrated operations**.

Note: The Indian Army is observing the year **2024** as the **year of Technology Absorption**.

What are the Areas Identified for the 'Year of Reforms' in 2025?

- **Jointness & Integration:** Strengthen cooperation among military services and promote the establishment of **Integrated Theatre Commands (ITCs)**.
 - Develop **joint operational capabilities** through inter-service cooperation & training.
 - **ITCs** includes the **China-focused northern command in Lucknow**, the **Pakistan-focused western command in Jaipur**, and the **maritime command in Thiruvananthapuram**.
- **Emerging Technologies:** Reforms should focus on new domains such as **Cyber and Space**, and emerging technologies like **Artificial Intelligence, Machine Learning, Hypersonics** and **Robotics**.
 - Associated tactics, techniques and procedures required to **win future wars** should also be developed.
 - Promote **technology transfer, knowledge sharing**, and public-private partnerships by improving ease of doing business between the defence and civil sectors.
- **Simplifying Acquisition:** Acquisition procedures should be **streamlined and time-bound** to accelerate and **strengthen** capability development.
- **Defence Exporter:** Position India as a **credible exporter of defence products**, fostering R&D and partnerships between Indian industries and foreign **Original Equipment Manufacturers**.

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Note:

- India's defence exports rose to **over Rs 21,000 crore**, up from Rs 2,000 crore in 2014.
- **Veteran Welfare and Indigenous Culture:** Ensure the **welfare of veterans** while leveraging their expertise.
 - Additionally, foster pride in **Indian culture** and confidence in achieving global standards through **indigenous capabilities**, while adapting best practices from modern militaries.

What is the Current Status of India's Defence Forces?

- **Importer to Exporter:** India has shifted from being the **largest arms importer to a major exporter**, with defense exports reaching **INR 210.83 billion in 2023-24**, and a target of **INR 500 billion by 2028-29**.
- **Defence Acquisition Reforms:** The **Defence Acquisition Procedure (DAP)** prioritizes domestic industry, requiring Indian companies to lead in manufacturing key systems and increasing **indigenous content (IC) to 50% or higher** in defense procurement.
- **Private Sector Involvement:** By 2022-23, private companies contributed **20% to India's defense production**.
 - The **TATA Aircraft Complex in Vadodara** marks India's first private sector final assembly line for military aircraft, dedicated to the **C-295 transport aircraft**.
- **Defence Industrial Growth:** India's defense production turnover grew from **INR 740.54 billion in 2016-17 to INR 1,086.84 billion in 2022-23**, with **14,000 MSMEs** and **329 startups** involved in defense by 2023.

Why Reforms in Defence Force Needed?

- **Lack of National Security Strategy (NSS):** The absence of **NSS** creates a **gap between political intentions and military operations**, undermining the alignment of defense strategies with national policies.
 - It has resulted in a **lack of preparedness against emerging threats** like those from China and Pakistan.
- **Rise of Cyberwarfare:** Cyberspace is the **5th domain of warfare**, with **state-sponsored actors and states themselves** sabotaging key economic parameters and military installations.

- This was seen in **Estonia** and other conflicts, with the latest being the **Ukraine-Russia cyber warfare**.
- **Dependence on Imports:** India remains the **world's top arms importer** for the period **2019-23** with imports having **gone up by 4.7%** compared to the period **2014-18**.
 - The slow indigenization pace and challenges in building a **competitive domestic defense industry** hinder self-reliance in defense production.
- **Cultural Resistance to Jointness:** The Indian military's **service-specific approach**, with each branch (**Army, Navy, Air Force**) maintaining its **autonomy** has led to resistance in adopting an integrated model.
- **Insufficient Funding:** Despite substantial allocation in absolute terms, it is **only 1.9% of India's GDP** which **limits modernization** of defence forces, particularly in areas such as technology, equipment, and infrastructure.
 - In 2020, the **FDI limit** in defense was increased to **74% through the automatic route** and up to **100%** through the **government route** for access to **modern technology**.
- **Ad-hoc Procurement Processes:** Post-**Galwan clash 2020**, the armed forces were granted **exclusive powers for emergency procurements** to address critical capability gaps, highlighting a **lack of strategic readiness** despite tactical necessity.
- **Short-term Policy:** The **Agnipath scheme** has been criticized for its **short 6-month training period**, raising concerns about recruits' readiness for real combat.
 - The **4-year service period** risks **losing experienced personnel**, potentially impacting the army's capability and morale.

What are India's Initiatives for Reforms in Defence Forces?

- **Defence Industrial Corridors**
- **Corporatization of the Ordnance Factory Boards**
- **Defence India Startup Challenge**
- **SRIJAN Portal**
- **Innovations for Defence Excellence (iDEX)**
- **Mission Raksha Gyan Shakti**

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Note:

Goldwater-Nichols Reforms in US

- **About:** The **Goldwater-Nichols Defense Reorganization Act, 1986** restructured the **US Department of Defense** to enhance **military effectiveness and efficiency**.
 - The reforms were designed to address issues identified in the aftermath of the **Vietnam War (1955-1975)** and **Operation Eagle Claw (the failed U.S. mission to rescue hostages in Iran)**.
- **Goal:** The primary goal was to improve **joint military operations**, strengthen civilian control, and streamline **defense decision-making**.
- **Key Provisions:**
 - Improved **military advice** to the President
 - **Clear responsibilities** for unified combatant commanders
 - **Unified commander's** authority and responsibilities
 - Strategy formulation and **contingency planning**
 - **Efficient use** of resources
 - **Joint officer** management
 - Effectiveness of **joint military operations**
 - **Defense management** and administration

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Note:

Miscellaneous

Highlights

- National Sports Awards 2024
- Vikram Sarabhai's 52nd Death Anniversary

National Sports Awards 2024

Why in News?

Recently, the **Ministry of Youth Affairs & Sports** announced the **National Sports Awards 2024**.

- Names of the awardee were announced for the **Major Dhyan Chand Khel Ratna**, **Arjuna**, **Dronacharya**, **Rashtriya Khel Protsahan Puraskar**, and **Maulana Abul Kalam Azad (MAKA)** trophy.

Who are the Recipients of National Sports Awards 2024?	
Awards	Recipients
Major Dhyan Chand Khel Ratna Award	Gukesh D (Chess) , Harmanpreet Singh (Hockey) , Praveen Kumar (Para-Athletics) and Manu Bhaker (Shooting) .
Arjuna Awards for outstanding performance	Jyothi Yarraji (Athletics) , Annu Rani (Athletics) , Nitu (Boxing) , Rakesh Kumar (Para-Archery) , Navdeep (Para-Athletics) etc.
Arjuna Awards (Lifetime) for outstanding performance	Sucha Singh (Athletics) , Murlikant Rajaram Petkar (Para-Swimming)
Dronacharya Award	Subhash Rana (Para-Shooting) , S Muralidharan (Badminton) etc.
Rashtriya Khel Protsahan Puraskar	Physical Education Foundation of India
MAKA Trophy	Chandigarh University (Overall winner)

What are the Various Sports Awards Given in India?

- **Major Dhyan Chand Khel Ratna Award:** It is considered **India's highest sporting honour**.
 - The award is given for **outstanding performances** in sports spanning over a period of **four years** and the winners receive a **medallion, certificate and a cash prize**.
- **Arjuna Award:** It is awarded for **consistently good performance over a period of four years**.
 - The winners of the Arjuna Award receive a **statuette of Arjuna, a certificate and a cash prize**.
- **Dronacharya Award:** It is India's highest sports honour for **coaches**.
 - It is awarded to individuals for **producing medal winners** at prestigious international events.
- **Major Dhyan Chand Award:** It is another award named after India's hockey magician **Dhyan Chand**.
 - It represents **India's highest honour for lifetime achievements** in sports.
- **Maulana Abul Kalam Azad Trophy:** It is given to an **institution or university** for top performance in **inter-university tournaments** over the last **one year**.
- **Rashtriya Khel Protsahan Puraskar:** It is awarded to **organisations or corporates (both private and public) and individuals** for playing a role in the area of sports promotion and development over the last three years.

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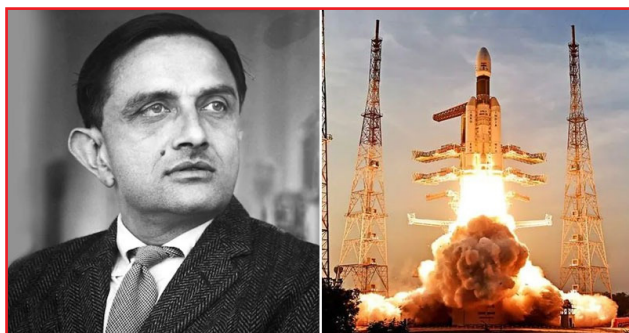
Note:

Vikram Sarabhai's 52nd Death Anniversary

Why in News?

Every year, the 30th December is observed as the death anniversary of **Vikram Sarabhai**.

- Vikram Ambalal Sarabhai was an **Indian physicist and industrialist** who initiated space research and helped develop nuclear power in India.



What are the Contributions of Vikram Sarabhai?

➤ Early Life and Education:

- Born on 12th August 1919, in Ahmedabad, Gujarat, to an affluent Jain family, Sarabhai was one of eight children of Ambalal and Sarla Devi.
- He showed **creative promise early**, building a working model of a train engine at 15, now preserved at the **Community Science Centre (CSC)** in Ahmedabad.
- He completed his Tripos (undergraduate degree) in Natural Sciences from St. John's College, Cambridge (1940).
- He returned to India during **World War II** to research **cosmic rays** under **Dr. CV Raman** at the Indian Institute of Science, Bengaluru.
- He was awarded a PhD from Cambridge in 1947 for his thesis on cosmic rays.

- **Institutional Legacy:** Dr. Sarabhai was instrumental in establishing several institutions that continue to shape India's scientific and industrial landscape:

- **Physical Research Laboratory (PRL), Ahmedabad:** Founded in 1947, PRL marked the beginning of Sarabhai's journey in institution building.
- **Indian Institute of Management (IIM), Ahmedabad:** Played a pivotal role in its creation.
- **Community Science Centre, Ahmedabad:** Founded in 1966 to promote science education.
- **Darpan Academy for Performing Arts, Ahmedabad:** Co-founded with his wife, Mrinalini Swaminathan.
- **Vikram Sarabhai Space Centre (VSSC), Thiruvananthapuram:** A hub for India's space missions.
- **Space Applications Centre, Ahmedabad:** Formed by merging six institutions.
- Electronics Corporation of India Limited (ECIL), Hyderabad.
- Uranium Corporation of India Limited (UCIL), Jaduguda, Bihar.

➤ Contributions to Indian Space and Nuclear Programs:

- **Indian Space Research Organisation (ISRO):** He founded the **ISRO**, emphasizing the importance of space technology for societal development.
 - Advocated for **satellite applications** to address India's developmental challenges.
- **Satellite Instructional Television Experiment (SITE):** Conceptualized with NASA, **SITE** beamed educational programs to rural areas, laying the foundation for programs like **Doordarshan's Krishi Darshan**.
- **Aryabhata Satellite:** Initiated the fabrication of **India's first satellite, Aryabhata**, launched in 1975 from a Russian cosmodrome.
- **Atomic Energy Commission:** Took over as chairman after Homi Bhabha's death, advancing **nuclear science**.
- **Awards and Honors:**
 - **Awards:**
 - **Shanti Swarup Bhatnagar Award** (1962)
 - **Padma Bhushan** (1966)
 - **Padma Vibhushan** (posthumously, 1972)

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Note:

○ **Distinguished Positions:**

- President, Physics Section, Indian Science Congress (1962)
- President, General Conference of the IAEA, Vienna (1970)
- Vice-President, Fourth UN Conference on Peaceful Uses of Atomic Energy (1971)

- **Title:** Mahatma Gandhi of Indian Science (By former President APJ Abdul Kalam).

○ **Legacy:**

- Vikram Sarabhai Space Centre (VSSC) was named in his honor.
- A lunar crater, "Sarabhai Crater," was named after him.

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Note:

Rapid Fire Current Affairs

Highlights

- 77th India Army Day
- Reconstitution of Atomic Energy Commission
- Chimpanzee Conservation
- Discoveries in Biology Using *C. Elegans*
- Odisha Joins Ayushman Bharat-PMJAY Scheme
- Indian Fishermen Detained Near Diego Garcia
- Prevalence of Hysterectomies in India
- Cyclone Dikeledi Hits Mayotte
- Death Anniversary of Lal Bahadur Shastri
- World Hindi Day 2025
- Commissioning of Nilgiri, Surat and Vaghsheer
- Z-Morh Tunnel
- Mobile Connectivity at Maha Kumbh Mela 2025
- Unauthorized Railway E-ticket Declared Illegal
- Henley Passport Index 2025
- Cryo-Born Baby Corals
- Tidal Tail
- 10 Years of NITI Aayog
- Emergency Declared in Trinidad and Tobago
- GOBARdhan Scheme
- Eruptions in Kilauea Volcano
- Anji Khad Bridge
- India's Progress Under NCAP
- Marine Fungi
- 30th Anniversary of World Trade Organisation
- Indonesia Joined BRICS
- New ISRO Chairman Dr. V. Narayanan
- UDISE+ Report 2023-24
- Inauguration of Jammu and Rayagada Railway Division
- India's First Organic Fisheries Cluster in Sikkim
- 358th Birth Anniversary of Guru Gobind Singh Ji
- BHARATPOL Portal
- 78th Foundation Day of Bureau of Indian Standards
- 193rd Birth Anniversary of Savitribai Phule
- HMPV Virus
- Dinosaur Highway
- Department of Scientific and Industrial Research
- World Braille Day 2025
- Panchayat Se Parliament 2.0
- Sree Narayana Guru
- Winter Char Dham
- Hydrogel for Cancer Therapy
- Property Restoration under MWPSC Act, 2007
- AICTE's 2025 'Year of AI'
- Inter-State Translocation of Tigers
- MoU Between CENJOWS and NDMA
- Thanthai Periyar Memorial
- Indo-Pak Exchange of Nuclear and Prisoner Lists
- Polar Sundial at VSSC
- Mount Kanlaon
- NPCI Extends Market Cap Deadline for UPI Apps
- Advocates of Supreme Court
- Memorials for Leaders
- Moldova and Transnistria
- Index of Eight Core Industries (ICI)
- Birth of the Commercial Internet
- Surya Kiran Military Exercise
- Rapid World Championship
- Vembanad Lake
- Shivaji Statue at Pangong Lake

77th India Army Day

Indian Army Day is celebrated annually on 15th January to commemorate the appointment of General (later Field Marshal) K. M. Cariappa was the first Indian Commander-in-Chief of the Indian Army in 1949.

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Note:

- He succeeded **British General Sir F. R. R. Bucher**, marking a historic moment in India's post-independence military leadership.
 - **2025 Theme: 'Samarth Bharat, Saksham Sena'** (Capable India, Empowered Army).
 - **Hosts:** Pune hosts the Army Day parade for the **first time**, emphasizing its military significance.
 - It is home to key establishments like the **Southern Command**, **National Defence Academy (NDA)**, and **DRDO** facilities.
 - **Year of Defence Reforms:** The Indian government has declared **2025** as the **"Year of Defence Reforms,"** aiming to **integrate theatre commands**, enhance **tri-services synergy**, streamline military procurement, and **promote indigenous capabilities**.
 - **Armed Forces Veterans' Day:** Celebrated annually on **14th January** to honor the service and sacrifices of Indian armed forces veterans.
 - It marks the **retirement of KM Cariappa in 1953**.
 - **Indian Navy Day:** 4th December.
 - **Indian Air Force Day:** 8th October.
- Read More: [Indian Army day](#)

Reconstitution of Atomic Energy Commission

The government has recently reconstituted the **Atomic Energy Commission (AEC)**.

- **Ajit Kumar Mohanty**, Secretary, **Department of Atomic Energy (DAE)**, is the **Chairman** of the AEC and **National Security Adviser Ajit Doval** is among the key members.
- **About Atomic Energy Commission (AEC):** AEC was first established in **August 1948** to oversee atomic energy research under the **Department of Scientific Research**.
 - In **1958**, the AEC was restructured within the **DAE**, and set up in **1954**, under the **direct charge of the Prime Minister**.
 - The Secretary of the **DAE** serves as the **ex-officio Chairman** of the Commission, with other members appointed annually upon **Prime Ministerial approval**.

- The AEC formulates policies to promote **peaceful uses of nuclear energy**, empowering India through advancements in **nuclear technology, healthcare, food security, and energy independence**.

Read more: [Year End Review 2019: Department of Atomic Energy](#)

Chimpanzee Conservation

NGO Papaye International in Cameroon has been in the news, which operates a sanctuary for **orphaned chimpanzees** in the **Douala-Edea National Park**.

- **About Chimpanzee:** Chimpanzees (*Pan troglodytes ssp.*) are one of our nearest living relatives, sharing a common ancestor with humans that lived approximately 7-8 million years ago.
 - **Subspecies:** Four recognized subspecies: **Central chimpanzee**, **Western chimpanzee**, **Nigeria-Cameroon chimpanzee**, and **Eastern chimpanzee**.
- **IUCN Status:** Chimpanzees listed as **endangered**, with **Western chimpanzees** classified as **Critically Endangered**.
- **Cultural Diversity:** Chimpanzees exhibit **culturally learned behaviors**, including **tool use, vocal dialects, and feeding techniques**, varying by subspecies.
 - They live in highly **structured social groups**, often consisting of 20 to 150 members, showcasing complex communication and behaviors.
 - Examples of tool use by Chimpanzees include **termite fishing, harvest honey and nut cracking**, with **variations in tools and techniques** across populations.
- **Feeding Habits:** Chimpanzees have diverse diets, such as **mangrove leaves** and **cave use**, particularly in **dry environments**.
 - **Habitat destruction** and **hunting** threaten **genetic and cultural diversity**, making **conservation efforts** crucial.
- **About Cameroon:**
 - It is located in **Central Africa**, bordered by **Nigeria, Chad, the Central African Republic, Congo, Gabon, and Equatorial Guinea**.

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Note:

- It features diverse geography, including coastal plains, mountains, and rainforests.



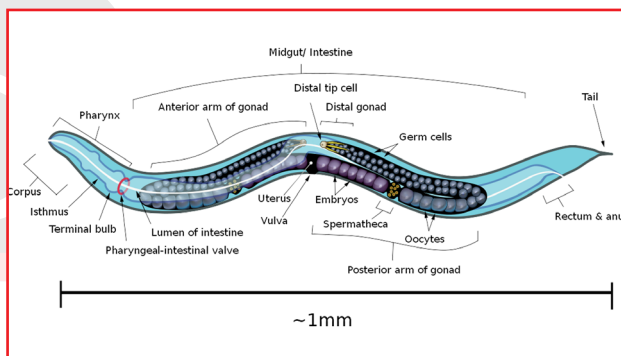
Read more: [Mining Threatens African Great Apes](#)

Discoveries in Biology Using C. Elegans

The roundworm *Caenorhabditis elegans* has played a pivotal role in numerous [Nobel Prize](#)-winning discoveries, shedding light on fundamental biological processes.

- **Nobel Winning Research on C. Elegans:**
 - **Victor Ambros and Gary Ruvkun (2024 Nobel Prize in Physiology or Medicine):** Discovered [microRNAs](#) and their crucial role in **gene expression** control.
 - **Osamu Shimomura, Martin Chalfie, and Roger Tsien (2008 Nobel Prize in Chemistry):** Developed **green fluorescent protein (GFP)**, enabling live-cell imaging and revolutionizing biological research.
 - GFP is a tool used in **molecular and cell biology** for **visualizing and tracking** biological processes.

- **Andrew Fire and Craig Mello (2006 Nobel Prize in Medicine):** Discovered **RNA interference (RNAi)**, revolutionizing gene-silencing techniques.
 - It led to the discovery that **double-stranded RNA (dsRNA)** can **silence specific genes**, offering potential **therapeutic applications**.
- **Sydney Brenner (2002 Nobel Prize in Medicine):** His research contributed to understanding **programmed cell death**.
- **About C. Elegans:** It is a **tiny invertebrate**, measuring just **1 mm in length**, and **transparent nematode**.
 - Nematodes, also called **roundworms**, are **unsegmented, cylindrical**, and often **microscopic** organisms and a major component of **soil and sediment ecosystems**.
 - They are **parasitic** in animals or plants or **free-living** in soil or water.



Read More: [Nobel Prize 2024 in Physiology or Medicine](#)

Odisha Joins Ayushman Bharat-PMJAY Scheme

Odisha becomes the **27th** state to adopt [Ayushman Bharat Pradhan Mantri Jan Arogya Yojana \(AB PM-JAY\)](#), with **26 states** and all **18 union territories** already on board (**Delhi** and **West Bengal** have **not joined** AB PM-JAY).

- AB PM-JAY is a **centrally sponsored scheme** with a cost ratio of **60:40** for the Centre and states and **90:10** for the north-eastern states, Himalayan states and Union Territories. **States** have the **option to opt out** of the scheme.

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Note:

- **Convergence:** AB PM-JAY will operate alongside Odisha's existing **Gopabandhu Jan Arogya Yojana (GJAY)**.
 - GJAY provides **affordable and accessible healthcare services** to the economically disadvantaged sections in Odisha.
- **Coverage Details:** Each family will be covered for up to **Rs 5 lakh per year**, with an **additional Rs 5 lakh for women members**. A total of **1.03 crore families** will benefit in Odisha.
- **About AB PM-JAY:**
 - It is the **world's largest health coverage scheme**, covering **approximately 45%** of India's population.
 - It provides health coverage for **secondary and tertiary care** to **55 crores individuals** in India, benefiting **12.3 crore families**.
 - The scheme now provides **free treatment** for all **senior citizens aged 70 years and above**.
 - AB PM-JAY has a network of **30,985 empaneled hospitals**, with **12,881 private hospitals** offering over **2,000 medical procedures** across **27 specialties**.

Read More: [Ayushman Bharat](#)

Indian Fishermen Detained Near Diego Garcia

15 Indian fishermen were **detained** by the **British Navy** near **Diego Garcia** for allegedly crossing the maritime boundary.

- This is part of a **broader issue** where **Tamil Nadu fishermen** are frequently detained by both the **Sri Lankan navy** and the **British navy**, affecting their livelihood and safety.
- **About Diego Garcia:**
 - Diego Garcia is located in the **Indian Ocean** and it is the **largest island** of the **Chagos Archipelago**.
 - The **Chagos Archipelago** was once part of **Mauritius** but was separated in **1965** to create the **British Indian Ocean Territory (BIOT)**.
 - It is administered by Britain but **leased** to the **US in 1966 for military purposes**. It became a fully operational **military base in 1986**.

- It was a key location in the **US overseas war on terror** operations following **al-Qaeda's September 11 attacks** on the **US in 2001**.
- In **October 2024**, **Britain** agreed to **cede sovereignty** of the **Chagos Archipelago** to **Mauritius** but will **retain sovereign rights** over **Diego Garcia**.



Read More: [Chagos Archipelago and Diego Garcia Island](#)

Prevalence of Hysterectomies in India

National Family Health Survey (NFHS)-4 data shows higher **hysterectomy** (surgical removal of uterus) rates in India among **low-income agricultural workers** and **affluent women**, due to differing reasons.

Reasons for High Hysterectomy:

- **Factors for agricultural workers** include poor hygiene, menstrual taboos, delayed gynecological care, and physical labor.

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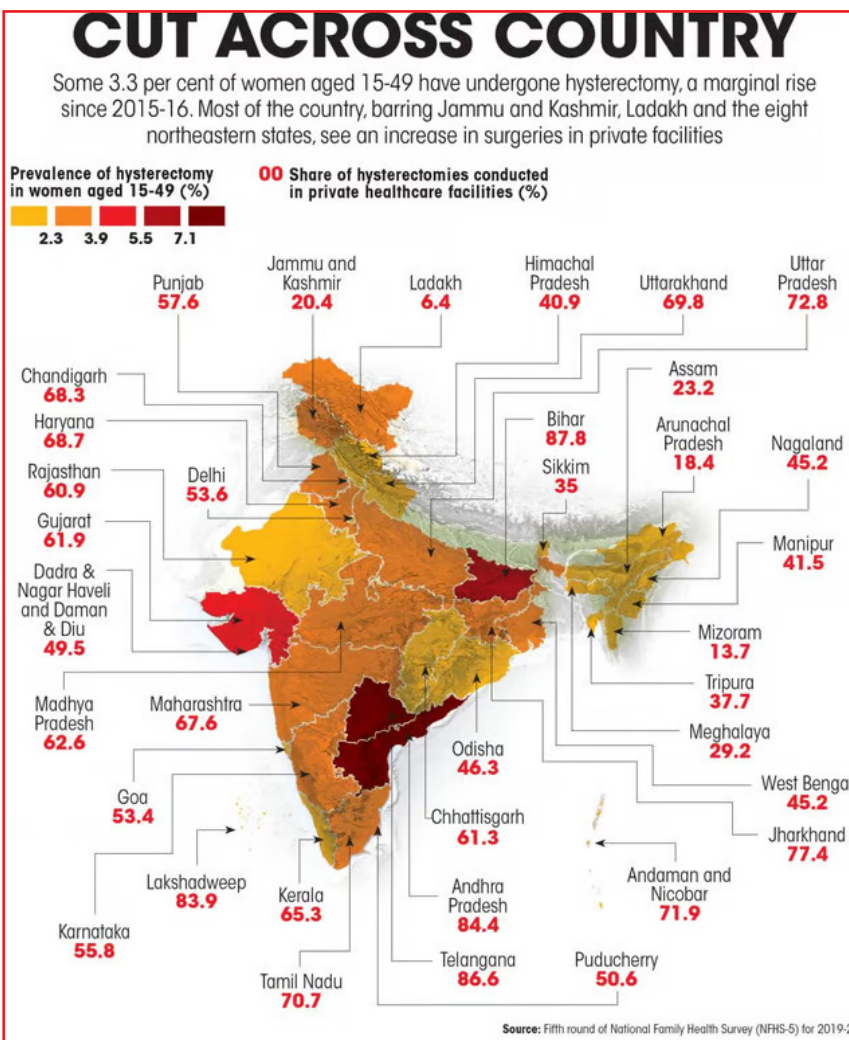
Note:

- **Example:** Maharashtra's Beed district reports an unusually **high number of hysterectomies** among female sugarcane workers.

- **Wealthier women** often opt for the procedure due to **better affordability and access**.
- **Financial incentives** under schemes like **Rashtriya Swasthya Bima Yojana (RSBY)** sometimes lead to unnecessary surgeries.

Hysterectomy:

- **About:**
 - A hysterectomy is a surgical procedure to **remove the woman's uterus (womb)**.
 - It is performed for gynecological conditions like **fibroids, endometriosis, abnormal bleeding, and pelvic inflammatory disease** when other treatments fail.
 - It is also used in **cancer treatment** and for **severe, unresponsive pelvic pain**.
- **Prevalence in India:**
 - **NFHS-5** data shows that **3% of women aged 15-49 in India** have undergone a hysterectomy.
 - **Highest Prevalence:** Andhra Pradesh (9%) and Telangana (8%)
 - **Lowest Prevalence:** Sikkim (0.8%) and Meghalaya (0.7%).
 - The Southern region has the **highest prevalence (4.2%)**, followed by the Eastern region (3.8%), while the Northeast has the lowest (1.2%).



Read More: [NFHS-5 National Report](#), [Hysterectomy](#)

Cyclone Dikeledi Hits Mayotte

Cyclone Dikeledi hit Mayotte, a French Indian Ocean territory, located in the [Mozambique Channel](#) (Indian Ocean).



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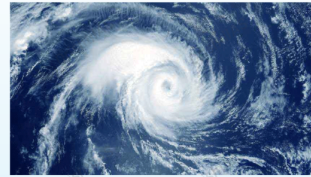
Note:

➤ **About Mayotte:**

- It consists of **two islands** of the **Comoros archipelago**, with the main island called **Mayotte (or Grande Terre)** and the smaller island **Pamandzi (Petite Terre)**.
- It is the **poorest territory** in both **France** and the **European Union**.
- **France colonised Mayotte in 1843** and **annexed** the whole archipelago, including Comoros, in **1904**.
 - In a **1974 referendum**, **95%** backed **separation** but **63%** of Mayotte voted to **stay French**.
 - **Grande Comore, Anjouan and Moheli** declared independence in **1975**. **Mayotte** is still ruled from **Paris**.
- **Cyclone Chido**, which had struck **Mayotte in December 2024**, was the **worst** storm to hit the archipelago in **90 years**.

CYCLONE

Cyclones are rapid **inward** air circulation around a **low-pressure** area.

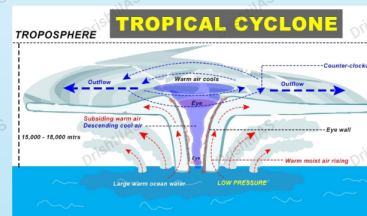


Cyclone v/s Anticyclone

Pressure System	Pressure Condition at the Center	Pattern of Wind Direction	
		Northern Hemisphere	Southern Hemisphere
Cyclone	Low	Anticlockwise	Clockwise
Anticyclone	High	Clockwise	Anticlockwise

Classification

- **Tropical Cyclones;** originate between the **Tropics of Capricorn and Cancer**
- **Extra Tropical/ Temperate Cyclones;** originate in the **Polar Regions**



Conditions for Formation

- Large sea surface with temperature $>27^{\circ}\text{C}$.
- Presence of the **Coriolis force**
- Small **variations in the vertical wind speed**
- A **pre-existing weak low- pressure area**
- **Upper divergence** above the sea level system

Different Names for Tropical Cyclones

- **Typhoons** - Southeast Asia and China
- **Hurricanes** - North Atlantic and eastern Pacific
- **Tornados** - West Africa and southern USA
- **Willy-willies** - Northwest Australia
- **Tropical Cyclones** - Southwest Pacific and Indian Ocean

Nomenclature

- Nodal Authority - **World Meteorological Organization (WMO)**
- Indian Ocean Region - **Bangladesh, India, Maldives, Myanmar, Oman, Pakistan, Sri Lanka and Thailand** contribute to naming cyclones that occur in this region.

Cyclones in India

- **Bi-annual Cyclone Season** - March to May and October to December
- Recent Cyclones - **Tauktae, Vayu, Nisarga and Mekanu** (in Arabian Sea) and **Asani, Amphan, Fani, Nivar, Bulbul, Titli, Yaas and Sitrang** (in Bay of Bengal)

Read More: [Cyclone Chido in Mayotte](#)

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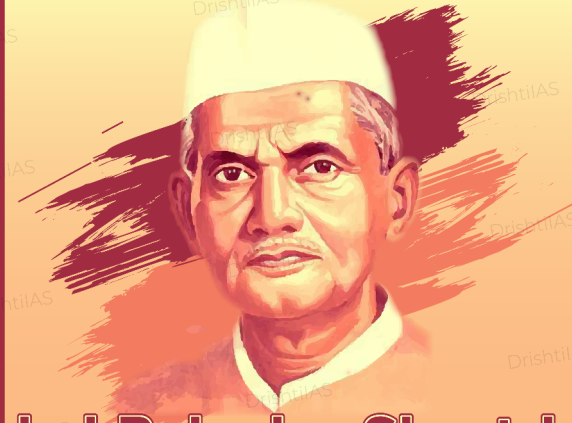
Death Anniversary of Lal Bahadur Shastri

11th January marked the 59th death anniversary of **Shri Lal Bahadur Shastri**, the second Prime Minister of India.

➤ About Lal Bahadur Shastri:

- Shastri was born on **2nd October 1904**, in **Mughalsarai**, near **Varanasi**.
- A key figure in India's **freedom struggle**, Shastri was deeply influenced by **Mahatma Gandhi**.
- He was known for his **integrity**, humility, and dedication to public service, rising through the ranks of the **Indian National Congress**.

- Shastri held several critical ministerial positions, including **Home Minister**, **Minister of Railways**, and **Minister of Commerce and Industry**.
- As **Railways Minister**, he resigned twice following major train accidents, demonstrating his **moral accountability**.
- As **Prime Minister** (1964-1966), Shastri displayed decisive leadership during the **1965 Indo-Pak war**, authorizing military action to defend **Kashmir**.
- Shastri's legacy includes the famous slogan "**Jai Jawan Jai Kisan**", emphasizing the importance of **soldiers and farmers** in India's progress.
- Shastri died **suddenly in Tashkent** on **11th January 1966**, shortly after signing the **Tashkent Declaration**; his death remains a subject of mystery.



▲ **1935:** General Secretary of UP Pradeshik Congress Committee (PCC)

▲ **1940:** Participated in **Individual satyagraha** and sent to prison

▲ **1942:** Released from jail; Participated in the **Quit India Movement**

Post-independence Journey

▲ **1952:** Minister of Railways and Transport

▲ **1959:** Minister of Commerce and Industry

▲ **1961:** Minister of Home Affairs

Prime Minister of India (1964-66)

▲ **1964:** Second Prime Minister of the Republic of India

▲ **1964:** Took initiative of White Revolution

▲ **1965:** Established National Dairy Development Board (NDDB)

▲ **1965:** Took initiative for Green Revolution

Wars During His Tenure

▲ **1962:** War with China

▲ **1965:** War with Pakistan

Death

▲ **11th January 1966:** Died in Tashkent, Uzbekistan

▲ Just one day after signing the peace treaty to end the 1965 war with Pakistan

▲ **1978:** A Book '**Lalita ke Aansoo**' was published by M.L Verma

▲ Tragic story of his death is narrated by his wife Lalita Devi

▲ **1977:** Raj Narain committee: To look into the mysterious death of Shastri ji

▲ **Vijay Ghat:** Shastri ji's resting place (Delhi)

▲ **IAS training institute, Mussoorie:** Named as Lal Bahadur Shastri National Academy of Administration (LBSNAA)

Lal Bahadur Shastri
The Man of Peace

Brief Description

▲ **Birth:** 2nd October 1904, Mughalsarai (Uttar Pradesh)

▲ **Kashi Vidyapeeth:** Degree in Philosophy and Ethics

▲ **Famous Slogan:** 'Jai Jawan Jai Kisan'

▲ **Bharat Ratna (1966):** Awarded Posthumously

▲ **Lifetime Member:** Lok Seva Mandal (founded by Lala Lajpat Rai)

Political Journey

▲ **1928:** Joined Indian National Congress

▲ **1930:** Joined Freedom Movement

"Discipline and united action are the real source of strength for the nation."

➤ Tashkent Declaration:

- The **Tashkent Declaration** was signed in **January 1966**, between **India and Pakistan**.
- It aimed to restore peace and resolve issues arising from the **1965 Indo-Pak war**, promoting mutual understanding.

Read More: [Lal Bahadur Shastri Jayanti](#).

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Note:

World Hindi Day 2025

Vishwa Hindi Divas or **World Hindi Day** is celebrated annually on 10th January to expand Hindi's presence on the international stage.

- **About World Hindi Day:**
 - This date commemorates the historic moment in **1949**, when Hindi was first spoken at the **United Nations General Assembly (UNGA)**.
 - In **1975**, the first **World Hindi Conference** was inaugurated by **Prime Minister Indira Gandhi**, marking an important step toward global recognition of Hindi.
 - **World Hindi Day**, designated on **10th January 2006**, is different from **Hindi Diwas** celebrated on **14th September**, as Hindi Diwas marks the adoption of Hindi as one of India's official languages in **1949**.
- **Significance:**
 - Hindi, with over **600 million speakers**, is the third most spoken language globally, and **most spoken language in India**.
 - The day is observed to raise awareness of Hindi's **importance** as a global language of communication.
- **World Hindi Day 2025 Theme:**
 - The theme for **World Hindi Day 2025** is **"A Global Voice of Unity and Cultural Pride,"** focusing on promoting **linguistic exchange** and fostering **cultural pride** through Hindi.
- **Constitutional Status of Hindi:**
 - Hindi is recognized as the **official language of India** under **Article 343 of the Constitution**, alongside English for official purposes.
 - It is also listed in the **8th Schedule**, which includes 22 languages recognized for official use.

Read More: [Hindi Diwas 2024](#)

Commissioning of Nilgiri, Surat and Vaghsheer

The **Indian Navy** announced the commissioning of **Nilgiri**, **Surat**, and **Vaghsheer**, built at **Mazagon Dock Shipbuilders Limited (MDL)**, on 15th January 2025, at Mumbai.

- **Nilgiri:** The lead ship of **Project 17A**, represents a major upgrade over the Shivalik-class frigates, featuring advanced **stealth technology** and state-of-the-art weapon systems to strengthen naval defense.
- **Surat:** The fourth and final destroyer under **Project 15B**, is an enhanced version of the **Kolkata-class destroyers**, equipped with **long-range missiles** and indigenous weapons systems.
 - **Project 15B** is an initiative by the Indian Navy to design and construct four advanced guided-missile destroyers
- **Vaghsheer:** The sixth submarine in the **Scorpene-class (Project 75)**, is one of the quietest diesel-electric submarines globally, capable of **anti-surface and anti-submarine warfare**, surveillance, and special operations.
 - **Project-75 (India)** aims to build **18 conventional submarines and six nuclear-powered submarines** for the Indian Navy.

Read More: [Project 17A and INS Taragiri](#)

Z-Morh Tunnel

The **Prime Minister** inaugurated the **Z-Morh tunnel** aimed at improving **all-weather connectivity** between **Ladakh and Kashmir**.

- **Location:** The **6.5 km Z-Morh tunnel**, located at **8,650 feet in Ganderbal, Kashmir**, bypasses avalanche-prone zones on the **Srinagar-Leh highway (NH-1)**.
 - It was built under the **Thajiwas glacier** and the tunnel has been renamed **Sonamarg tunnel**.
 - **Timeline:** Built at **Rs 2,400 crore**, the project began in **2015** under **BRO** but later, it was developed by the **National Highways and Infrastructure Development Corporation Limited (NHIDCL)**.
 - **Strategic Partnership:** Paired with the **Zojila tunnel**, it improves road access to **Ladakh**, reducing the route by **6 km** between **Srinagar and Ladakh**.
 - The **Zoji La tunnel (14.15 Km)**, Asia's longest **bi-directional tunnel**, will ensure all-weather connectivity between **Srinagar, Kargil, and Leh**.
 - **Strategic Significance:** Ensures year-round connectivity to Ladakh for **military and civilian needs**.
- Read More: [Z-Morh Tunnel](#)

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Mobile Connectivity at Maha Kumbh Mela 2025

The government is preparing to provide **seamless mobile connectivity** at the **Maha Kumbh Mela 2025** in Prayagraj.

- **Maha Kumbh Mela 2025** is expected to host **40 crore devotees over 44 days**, averaging nearly **1 crore devotees per day** expected to be the **maximum tele-density** in human history.
- Over **100 km** of **optical fibre** has been laid, and each **tower** will be configured with **higher radio capacities** to ensure peak data capacity.
- **78 transportable towers and 150 small cell solutions** will be deployed in **crowded zones** to maintain communication.
- **Special centres** will facilitate **emergency communication**, coordinated with local authorities.
- The Maha Kumbh Mela 2025, a sacred pilgrimage, will be held in **Prayagraj** from **13th January to 26th February 2025**.
 - It occurs every **12 years**, rotating among four locations i.e., **Prayagraj (UP), Haridwar (UK), Nashik (MH), and Ujjain (MP)**.
 - The word Kumbh refers to a **pot or vessel**, which, in **Hindu mythology**, is said to have held the **nectar of immortality (amrit)**.
- Uttar Pradesh has declared the **Maha Kumbh area in Prayagraj** as a new district called **Maha Kumbh Mela** for **4 months** i.e., **1st December 2024 to 31st March 2025**.

Read More: [Maha Kumbh Mela 2025](#)

Unauthorized Railway E-ticket Declared Illegal

In the *Mathew K Cherian Case, 2025*, the **Supreme Court** held that **unauthorised** business of **procuring and supplying railway e-tickets** is a **social crime** which must be stopped.

- **Section 143 of the Railways Act, 1989** addresses **penalties** for the unauthorized sale and procurement of railway tickets, **both online and offline**.
- The case referenced the *English case of Comdel Commodities Ltd. v. Siporex Trade SA Case, 1990* to argue that legal provisions can **extend to unforeseen technological advancements**.
 - The **Kerala High Court** had previously ruled that the provision **applied only to offline ticket sales** but was corrected by the Supreme Court.
- **Mathew**, the accused, created hundreds of **unauthorized user IDs** to circumvent ticketing limits set by **IRCTC (12-24 ticket reservations per month)**, violating **Section 143 of the Act**.
- The Indian Railways is a keystone of India's **infrastructure** that carries around **673 crore passengers annually**.

Read More: [Rerouting Indian Railways' Future](#)

Henley Passport Index 2025

In the latest **Henley Passport Index 2025**, India's rank has dropped to **85th**, down from **80th in 2024** giving its holders visa free access to **57 countries**.

- India's ranking showed fluctuations over the years, with its **highest being 71st in 2006** and **lowest 90th in 2021** due to **Covid-19** restrictions.

Henley Passport Index 2025

- **About:**
 - The Henley Passport Index **ranks 199 global passports** (covers 227 travel destinations) based on the **number of destinations their holders can travel to without a visa**, with data sourced from the **International Air Transport Association (IATA)**.
 - It is compiled and published by **Henley & Partners**, a global citizenship and residence advisory firm.
- **Key Highlights:**
 - **Top Rankings:** **Singapore** (195 destinations) leads, followed by **Japan** (193). Several **EU countries and South Korea** share 3rd place (192 destinations).

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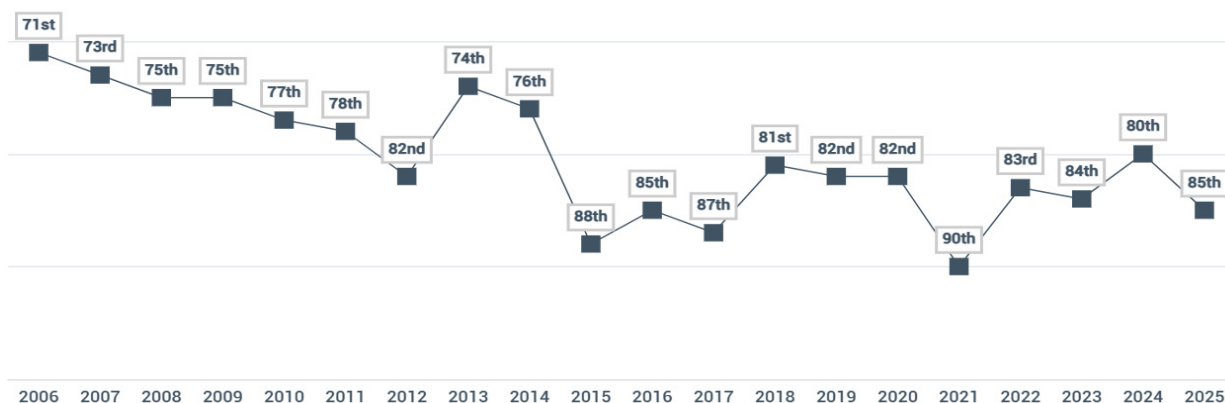


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India's Historical Ranking on the Henley Passport Index



- **Falling Rankings:** The US (2nd to 9th), the UK (1st to 5th).
- **Bottom Countries:** Pakistan and Yemen (shared the 103rd position) followed by Iraq, Syria and Afghanistan.
- As per UK-based online platform “Compare the Market,” 2024 data:
 - **Most Expensive Passports:** Mexico, Australia, and the USA
 - **Cheapest Passports:** UAE, India, and Hungary.
 - **India’s passport** stands out for offering the best “cost per year” value, making it highly economical compared to other countries.

Read More: [Henley Passport Index 2023](#)

Cryo-Born Baby Corals

The world’s first **cryo-born baby corals** have been successfully introduced into the **Great Barrier Reef**, marking a groundbreaking achievement in **coral restoration** and conservation.

- Australian scientists used cutting-edge **cryopreservation** to fertilize **coral eggs** with **cryopreserved sperm** collected from the **Great Barrier Reef**.
 - Scientists grew the corals in the **National Sea Simulator** before transferring them to specially designed ‘**coral cradles**’ on the Reef.
- It aims to introduce **heat-tolerant corals** to protect reefs from climate change and rising **ocean temperatures**.
- The **CryoDiversity Bank** in **Australia** holds the world’s **largest collection of frozen coral sperm** from 32 species, collected annually since 2011.
- **Coral Reefs:** Corals are **invertebrates** from the class **Anthozoa**, **phylum Cnidaria**.
 - Reefs are formed by **colonies of polyps** that secrete **limestone skeletons** and rely on **symbiotic algae (zooxanthellae)** for nutrition.
- **Soft corals** are species that **do not produce** the massive **calcium carbonate skeletons** needed to form coral reefs. Only **hard corals** make reefs.

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Note:

Coral Reefs

(Rainforests of the seas)



About

- Large underwater structures – made of skeletons of colonial marine invertebrates ‘coral’ – individually called polyp
- Symbiotic Relationship with algae ‘zooxanthellae’ (responsible for beautiful colours of corals)
- Support over 25% of marine biodiversity

Hard Corals vs Soft Corals

- Hard Corals - Rigid skeleton made of CaCO_3 - reef-building corals
- Soft Corals - Non reef-building

Great Barrier Reef (Australia)

- Largest Coral Reef in the World
- World Heritage Site (1981)
- Endures Mass Coral Bleaching



Corals in India

- Present in the areas of Gulf of Kutch, Gulf of Mannar, Andaman & Nicobar, Lakshadweep Islands and Malvan



Significance

- Coral reefs protect coastlines from storms/erosion, provide jobs, offer opportunities for recreation
- Source of food/medicines

Threats

- Natural: Temperature, Sediment Deposition, Salinity, pH, etc.
- Anthropogenic: Mining, Bottom Fishing, Tourism, pollution, etc.

Coral Bleaching

- Corals under stress - expel algae – thus turning white (bleached)
- Bleached corals - not dead – but, more risk of starvation/disease



Initiatives to Protect Corals

Technology

- Cyromesh: Storage of the coral larvae at (-196°C) - Can be later reintroduced to the wild
- Biorock: Creating artificial reefs on which coral can grow rapidly



Global

- International Coral Reef Initiative
- The Global Coral Reef R&D Accelerator Platform

Indian

National Coastal Mission Programme

Read More: [World's Largest Deep Sea Coral Reef](#)

Tidal Tail

A study led by [Indian Institute of Astrophysics \(IIA\)](#) researchers has revealed the formation of an **ultra-diffuse galaxy** at the end of the **longest tidal tail ever discovered**, associated with the **galaxy NGC 3785**, located 430 million light-years from **Earth in the Leo constellation**.

- Tidal Tail:** A tidal tail is a long, narrow stream of **stars and gas** created when **galaxies interact or merge**.
 - Gravitational forces during these interactions pull material from the outer regions of the galaxies, **stretching it into elongated streams** that extend into space.
 - Tidal tails can persist long after the **merger, serving as a signature of recent galaxy interactions**.
 - These tails provide valuable insights into how galaxies evolve and form stars.
 - Notably, a small portion of a galaxy's stellar formation occurs within tidal tails, highlighting their role in galaxy dynamics and evolution.
- Galaxy NGC 3785:** It is a **lenticular galaxy** located in the Leo constellation, north of the **celestial equator** (imaginary circle that extends from [Earth's equator](#) into space), making it more visible from the northern hemisphere.
 - A galaxy is a vast collection of gas, dust, stars, and solar systems, held together by **gravity**. Earth is part of one such galaxy.

Read more: [Dark Matter and Dark Energy](#)

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Note:

10 Years of NITI Aayog

On 1st January 2025, **NITI Aayog (National Institution for Transforming India)** completed a decade since its establishment on 1st January 2015, replacing the **Planning Commission** to align with the requirements of a dynamic, market-driven economy.

- **NITI Aayog** is an **advisory body** created through a resolution of the union cabinet (i.e. **neither constitutional nor statutory body**).

Key Achievements & Contribution:

- Shifted focus from **financial allocation to policy advisory**, promoting decentralized governance.
- **Strengthened competitive and cooperative federalism** through data-driven indices like the **SDG India Index** and **Composite Water Management Index**.
- Assisted states in establishing **State Institutions of Transformation (SITs)** to improve governance and policy implementation.
- **Aspirational Blocks Programme (2023)** focused on 500 underdeveloped blocks to achieve 100% coverage of key government schemes.
- **Atal Innovation Mission (AIM)** trained over one crore students through initiatives

like **Atal Tinkering Labs** and **incubation centres** to promote innovation and **entrepreneurship** and expanded innovation ecosystems to regional languages and focuses on **tribal and hilly areas**.

- Conceptualized initiatives like **e-Mobility**, **Green Hydrogen**, and the **Production-Linked Incentive (PLI) Scheme**.

NITI Aayog

(National Institution for Transforming India)

HISTORY- PLANNING COMMISSION

Set up in 1950
to direct investment activity

Replaced by **NITI Aayog** on January 1, 2015

Composition of #NITIaayog



OBJECTIVES

- ④ Foster **cooperative federalism**
- ④ Develop mechanisms to **formulate credible plans (village level)**
- ④ Interests of **national security** in economic strategy and policy
- ④ Special **attention to weaker sections**
- ④ Provide advice and encouragement to partnerships between **key stakeholders, national-international Think Tanks, research institutions**
- ④ Create **knowledge, innovation and entrepreneurial support system**
- ④ **Platform for** inter-sectoral and inter-departmental **issues resolution**
- ④ Maintain **state-of-the-art Resource Centre**

NITI Aayog vs Planning Commission

NITI Aayog	Planning Commission
Advisory Think Tank	Extra-constitutional body
Wider expertise	Limited expertise
Secretaries (CEO) appointed by PM	Secretaries appointed by usual process
Bottom-up approach	Top-Down approach
No Mandate to impose policies	Imposed policies on states
No power to allocate funds	Allocated funds to ministries/state govts

Major Initiatives

- ④ SDG India Index
- ④ Atal Innovation Mission
- ④ e-AMRIT Portal (electric vehicles)
- ④ Good Governance Index
- ④ India Innovation Index
- ④ Aspirational District Programme
- ④ 'Methanol Economy' programme

Issues

- ④ **No powers** in granting **discretionary funds** to states
- ④ Only an **advisory body**
- ④ **No role in influencing private or public investment**
- ④ **Politicisation of the organisation**
- ④ **Lacks the requisite power** to bring positive change



Read More: [NITI Aayog](#)

Emergency Declared in Trinidad and Tobago

Trinidad and Tobago has declared a state of **emergency** following a surge in gang violence in the country, which has led to raising the annual death toll to the highest since 2013.

- Trinidad and Tobago has a population of **1.5 million** and records one of the **highest murder rates**.

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Note:

- Previous states of emergency were declared in **2014** for gang violence and in 2021 for **Covid-19** restrictions.

Engagements with India:

- Trinidad and Tobago became the **first Caribbean country to adopt India's UPI platform**.
- Both countries granted each other **Most Favored Nation (MFN)** status in **1997**.
 - Bilateral trade reached a record **USD 368.96 million** in **FY 2023-24**.
- The **Indian Diaspora** constitutes about **42%** of the total population of the country.

About Trinidad and Tobago:

- **Capital:** Port of Spain.
- **Location:** Island nation in the **southeastern West Indies**, near **Venezuela and Guyana**.
- **Independence:** Gaining independence from the **UK on 31st August 1962**, and becoming a republic in **1976**, the nation is a member of the **Caribbean Community (CARICOM)**.
- **Geographical Features:**
 - **Highest Point:** Mount Aripo.
 - **Major Rivers:** Ortoire and Caroni.
 - **Natural Resource:** Pitch Lake, the world's largest asphalt reservoir.
 - **Mountain Range:** Northern Range, part of the **Andes** extension.



Read More: [2nd India-CARICOM Summit](#)

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Note:

GOBARDhan Scheme

The **Centre for Science and Environment (CSE)** has highlighted lack of transparency in data of operational **Compressed Biogas (CBG) plant** on **GOBARDhan portal**.

- **Compressed Biogas (CBG):** CBG is a **renewable energy** source produced from organic waste, including **agricultural residues**, cattle dung, municipal solid waste, and sewage sludge.
 - It helps in **replacing fossil fuels**, managing agricultural and animal waste, and reducing open burning.
- **GOBARDhan Scheme:** The **Galvanizing Organic Bio-Agro Resources Dhan (GOBARDhan)** initiative focuses on converting **waste into wealth** to promote a circular economy.
 - It aims to establish a strong ecosystem for **Biogas/Compressed Biogas (CBG)/Bio-CNG plants** to foster sustainable growth.
 - The Department of Drinking Water and Sanitation (DDWS), **Ministry of Jal Shakti**, serves as the **nodal department**.
- **Key Issues:**
 - **Slow Adoption:** Only **115 CBG plants** are functional as of December 2024, against the target of 5,000 by 2030.

- **Information Gaps:** The **GOBARDhan portal** lacks details on feedstocks used by specific CBG plants.
- **Operational Transparency:** The portal lacks a section for **operational plants** with updated information, making it difficult for policymakers to address entrepreneurs' challenges.

Read More: [India's Green Future through BioCNG](#)

Eruptions in Kilauea Volcano

Hawaii's Kilauea Volcano, one of the world's most active, has started **erupting once again**.

- **Kilauea Volcano:**
 - It is situated in **Hawaii Volcanoes National Park** in **Hawaii Island, USA**.
 - It is the **youngest and most active** Hawaiian **Shield Volcano**, renowned for **frequent eruptions**, with **more than 30 times eruptions since 1952**,
 - Kilauea's slopes merge with those of **Mauna Loa**, another active volcano, to its west and north.
- **Volcano:**
 - A **volcano** is an **opening on the surface** that allows material warmer than its surroundings to escape from its interior.
 - **Volcanoes in India:** **Barren Island (Andaman Islands)**, India's only active volcano.

VOLCANOES

A volcano is a vent or a fissure in the crust from which lava (molten rock), ash, gases, rock fragments erupt from a magma chamber below the surface

● **Types: On basis of -**

- **Periodicity of Eruption:**
 - Active volcano: Recently Erupted
 - Dormant Volcano: Potential for eruption, no imminent signs
 - Extinct: No recent eruptions, low possibility in future
- **Nature of Eruption:**
 - Hawaiian: Calmest types (low gaseous content)
 - Strombolian: Formation of large gas bubbles in magma
 - Vulcanian: More explosive
 - Plinian eruptions: Magma's volatile gases rise via a narrow conduit
 - Icelandic: Often build lava plateaus
- **Shape of Volcanoes:**
 - Shield volcanoes: Composed of basaltic lava, low slope
 - Cone volcanoes (Cinder Cones): Most abundant
 - Composite cones (stratovolcanoes): Formed by layers of diverse materials.

● **Volcanic Features:**

- **Extrusive :**
 - Crater: Cone-shaped vent for magma
 - Caldera: Large, crater-like depression
 - Volcanic Plateaus: Levelled areas from fissure eruptions

● **Intrusive:**

- Batholiths: Central core of a volcanic mountain.
- Dyke: Vertical intrusion cutting across country rock bedding.
- Sills: Tabular intrusions along sedimentary bedding.
- Laccoliths: Magma injection along horizontal sedimentary bedding.

○ **Minor:**

- Geysers: Underground water above 100°C, powered by magma, results in powerful eruptions with steam and diluted minerals.
- Hot Springs: Heated water flows quietly along fault zones.

● **Distribution of Volcanoes:**

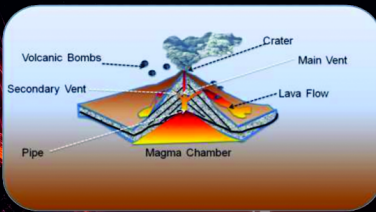
- Subduction zones (Circum Pacific Belt)
- Divergence zones (Mid Atlantic Ridge)
- Intra-plate oceanic volcanism (Hawaiian chain)
- Mid-continental belt and volcanoes in Mediterranean region


● **Volcanoes in India:**

- No volcanoes in Himalayans
- Barren Island (Only active volcano)

● **Products of Volcanic Eruption:**

- **Gases:** H, C, O, S, N, CH₄, NH₃
- **Solid:** Pyroclastic materials
- **Liquid:** Lava





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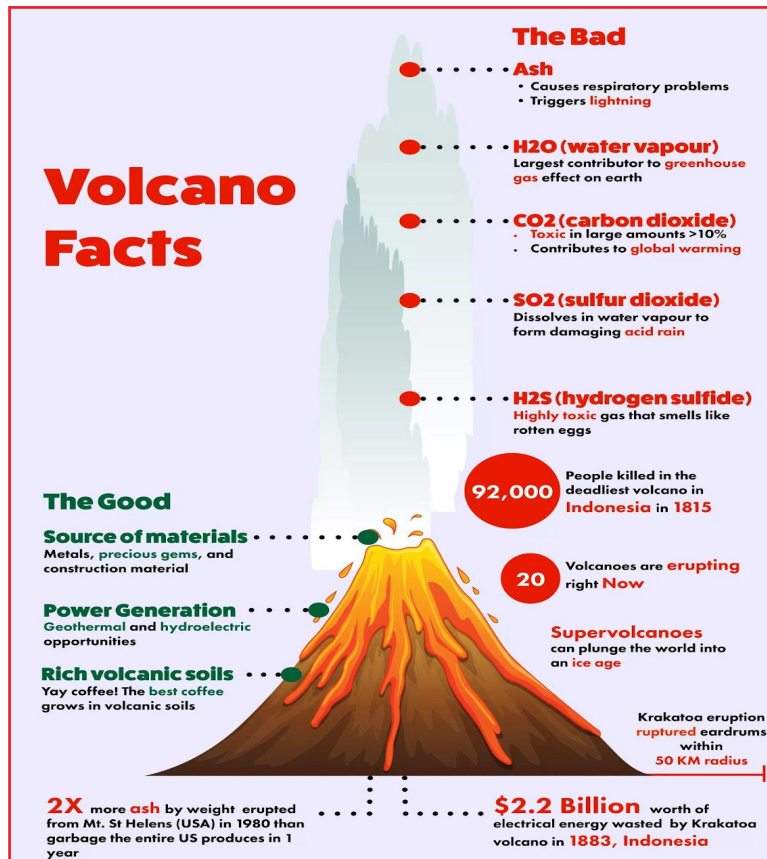


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Note:

Volcano Facts



Read More: [Kilauea Volcano: Hawaii](#)

Anji Khad Bridge

Indian Railways has successfully completed a trial run on the Anji Khad Bridge for enhancing railway connectivity in Jammu and Kashmir.

➤ About Anji Khad Bridge:

- It is India's first **cable-stayed rail bridge** located in Jammu and Kashmir's Reasi district. It is part of the **Udhampur-Srinagar-Baramulla Rail Link (USBRL)** project.
- The bridge spans **725.5 meters** with a **331-meter-high pylon**, built to withstand winds up to **213 km/h** and support trains traveling at **100 km/h**.
- It utilizes **96 cables** of varying lengths (82 to 295 meters) and an **innovative hybrid foundation** to stabilize the mountain slopes.
- It used **DOKA Jump Form Shuttering, Pump Concreting, and a Tower Crane Technique** to improve efficiency, reducing construction time by **30%**.

- The **DOKA Jump Form Shuttering Technique** is used for **constructing vertical concrete structures** like high-rises, bridges, and towers.

Read More: [First Cable-Stayed Railway Bridge of India](#)

India's Progress Under NCAP

India achieved a 26.84% reduction in nationwide **Particulate Matter (PM)** levels from 2019 to 2024, with **National Clean Air Programme (NCAP)** cities showing a **24.45%** improvement due to targeted interventions.

- **Top Performers:** Varanasi led with a 76.4% reduction in pollution, followed by Moradabad (58%) and Kanpur (51.2%).
 - Among the major cities, **Kolkata** saw a **21.5% reduction in pollution**, driven by stricter industrial regulations and improved public transport.
 - Southern and western cities, like Bengaluru (8%) and Chennai (9.2%), steadily reduced pollution levels.
- **Challenges:** Cities like Delhi (**PM 2.5** at 107 µg/m³) and Bijnor in Assam (PM 2.5 at 127.3 µg/m³) remain the most polluted cities.
 - Cities like Gurugram, Faridabad, and Ghaziabad require urgent interventions.
- **Key Contributors:** Industrial emissions, vehicular pollution, and **stubble burning** exacerbate pollution in northern states.
- **NCAP:** Launched in January 2019 by the **Ministry of Environment, Forest and Climate Change (MoEFCC)**, aims to reduce **PM₁₀** and **PM_{2.5}** levels by 20% by 2024-25, with 2017 as the baseline.
 - The target has been revised to **40% reduction in PM₁₀ levels or meeting national standards (60 µg/m³)** by 2025-26.

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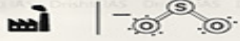
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Note:

Air Pollutants

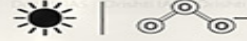
Sulphur Dioxide (SO₂)



It comes from the consumption of fossil fuels (oil, coal and natural gas). Reacts with water to form acid rain.

Impact: Causes respiratory problems.

Ozone (O₃)



Secondary pollutant formed from other pollutants (NO_x and VOC) under the action of the sun.

Impact: Irritation of the eye and respiratory mucous membranes, asthma attacks.

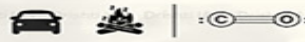
Nitrogen Dioxide (NO₂)



Emissions from road transport, industry and energy production sectors. Contributes to Ozone and PM formation.

Impact: Chronic lung disease.

Carbon Monoxide (CO)



It is a product of the incomplete combustion of carbon-containing compounds.

Impact: Fatigue, confusion, and dizziness due to inadequate oxygen delivery to the brain.

Ammonia (NH₃)



Produced by the metabolism of amino acids and other compounds which contain nitrogen.

Impact: Immediate burning of the eyes, nose, throat and respiratory tract and can result in blindness, lung damage.

Lead (Pb)



Released as a waste product from extraction of metals such as silver, platinum, and iron from their respective ores.

Impact: Anemia, weakness, and kidney and brain damage.

Particulate Matter (PM)



PM10: Inhalable particles, with diameters that are generally 10 micrometers and smaller.

PM2.5: Fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller.

Source: Emitted from construction sites, unpaved roads, fields, fires.

Impact: Irregular heartbeat, aggravated asthma, decreased lung function.

Note: These major air pollutants are included in the Air quality index for which short-term National Ambient Air Quality Standards are prescribed.



Read more: [Advancing Air Pollution Control in India](#)

Marine Fungi

Marine **fungi**, comprising **5% of ocean biomass**, play a crucial role in ecosystems, thriving in environments ranging from rocky seashores to deep waters.

- **About:** Marine fungi are **microscopic organisms** that live in ocean environments, playing key roles in decomposition, symbiosis, and producing bioactive compounds.

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Note:

- **Types: Obligate Marine Fungi** (exclusively marine), Facultative Marine Fungi (evolved from terrestrial environments, can survive in marine habitats)..
- **Survival Strategies:** Marine fungi adapt to **feast-famine** conditions by changing cell forms for better resource handling.
 - For example, *Paradendryphiella salina*, found on seaweeds, produces enzymes from bacteria to digest its host.
- **Ecological Importance:** Marine fungi are crucial for **nutrient cycling, ecosystem stability**.
 - **Lichens**, which represent a symbiotic relationship (fungi and algae living together), also contribute to marine ecosystems.
- **Fungi:** These **eukaryotic organisms** are **heterotrophs** (consume other plants or animals), functioning as **saprophytes** (feeding on dead and decaying organisms) or **parasites**.
 - Fungi reproduce sexually or asexually via **spores**. **R.H. Whittaker** classified Fungi as a distinct multicellular eukaryotic kingdom.
 - Fungi while beneficial in **medicine (e.g., antibiotics)**, food, and industry, they can also cause diseases, and produce **toxic mycotoxins**.

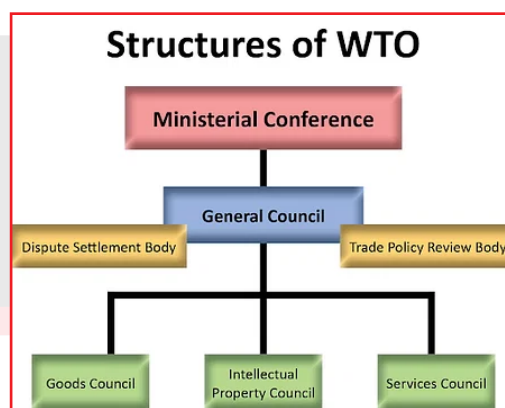
Read more: [Funga Taxonomic Kingdom](#)

30th Anniversary of World Trade Organisation

Recently, 1st January 2025 marked the 30th anniversary of the [World Trade Organization \(WTO\)](#).

World Trade Organization (WTO):

- **About:** WTO is an international institution formed to regulate **the rules for global trade** among nations.
 - It was formed under the [Marrakesh Agreement](#) signed on 15th April 1994 by 123 countries after the [Uruguay Round negotiations \(1986-94\)](#) of the [General Agreement on Tariffs and Trade \(GATT\)](#), leading to the **birth of WTO** in 1995.
- **WTO succeeded the GATT** which had regulated world trade since 1948.
 - **GATT** focused on trade in goods, while **WTO** covers trade in goods, services, and intellectual property, including creations, designs, and inventions.
- **Headquarters:** Geneva, Switzerland.
- **Members:** 166 countries, representing 98% of global trade.
- **Key Bodies:**
 - **Ministerial Conference (MC):** Highest decision-making authority.
 - **Dispute Settlement Body (DSB):** [DSB](#) resolves trade disputes.



- **Key WTO Agreements:**
 - **TRIMS (Trade-Related Investment Measures):** Prohibits measures that **discriminate against foreign products**, e.g., local content requirements.
 - **TRIPS (Trade-Related Aspects of Intellectual Property Rights):** [TRIPS](#) resolves disputes over intellectual property rights.
 - **AoA (Agreement on Agriculture):** [AoA](#) promotes **agricultural trade liberalization**, focusing on market access and domestic support.
 - **Other Agreements:**
 - [Sanitary and Phytosanitary Measures](#)
 - [General Agreement on Trade in Services](#)
 - [General Agreement on Tariffs and Trade](#)

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Note:

WTO AGREEMENT ON AGRICULTURE (AoA)

A WTO treaty negotiated during the Uruguay Round of the General Agreement on Tariffs and Trade (GATT); formally ratified in 1994 at Marrakesh, Morocco; Came into effect in 1995

FEATURES

- Market access (Promote market access for agricultural products by reducing trade barriers)
- Domestic support (Subsidy Boxes are included in this)
- Export subsidies (Reduce the use of export subsidies, which can distort trade)

SUBSIDY BOXES

Amber Box Subsidies:

- Can distort international trade by making a country's products cheaper in comparison to those of other countries
 - Examples: Subsidies for inputs such as fertilisers, seeds, electricity, irrigation, and Minimum Support Price (MSP)
- Amber box is used for all domestic support measures that are deemed to distort production and trade
 - As a result, the signatories are required to commit to reducing domestic supports that fall into the amber box
- Members who do not make these commitments must keep their amber box support within 5–10% of their value of production. (*De Minimis Clause*)
 - 10% for developing countries
 - 5% for developed countries
- India's MSP program remains under scrutiny, as it exceeds 10% ceiling

Blue box Subsidies:

- "Amber box with conditions" — designed to reduce distortion
- Any support that would normally be in the amber box is placed in the blue box if it requires farmers to limit production
 - These subsidies aim to limit production by imposing production quotas or requiring farmers to set aside part of their land
- At present there are no limits on spending on blue box subsidies

Green Box Subsidies:

- Domestic support measures that don't cause trade distortion or at most cause minimal distortion
- These subsidies are government funded without any price support to crops
 - Also include environmental protection and regional development programmes
- Allowed without limits (except in certain circumstances)



Read More: [Tepid Trade-Offs: On the WTO 13th Ministerial Conference](#)

Indonesia Joined BRICS

Recently, Indonesia has officially joined the **BRICS** group as the 10th member, effective from January 2025.

BRICS:

About:

- BRICS is an intergovernmental informal grouping of 10 emerging economies of the world.
- BRICS stands for the original founding members, Brazil, Russia, India, and China, with South Africa joining in 2010.
- In 2024, Iran, the United Arab Emirates (UAE), Egypt and Ethiopia also became its members.
 - Saudi Arabia is yet to formalise its BRICS membership.

- Argentina was initially expected to join the group in 2024 but **later decided against it**.

- The first BRIC Summit was held in Russia in 2009.

Significance:

- Economic Influence:** Prior to Indonesia's membership, BRICS represented 35% of global GDP and 46% of the world's population.
- Counterbalance to G7:** Aims to strengthen the influence of emerging economies and counter the dominance of the Western-led global financial system like G7.

Future Agendas for BRICS:

- Reduce reliance on the US dollar in international transactions, strengthening local currencies and promoting non-dollar transactions, potentially reshaping global trade and finance.

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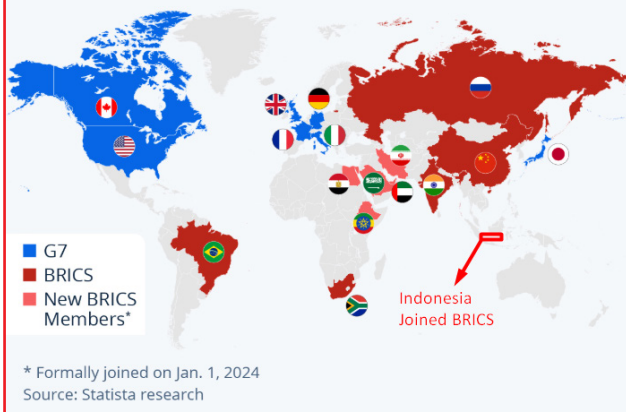


Note:

- It aims to **promote greater equity, inclusivity, and reforms in global institutions** such as the **IMF** and **UN**.

BRICS Expands Footprint in the Global South

G7 and BRICS member countries (as of Jan. 4, 2023)



Read More: [16th BRICS Summit & India-China Border Agreement](#)

New ISRO Chairman Dr. V. Narayanan

Dr. V. Narayanan will succeed S. Somanath as **Indian Space Research Organisation (ISRO)** Chairman and Secretary of the **Department of Space (DoS)**, starting 14th January 2025, for a two-year tenure.

- **Narayanan's Role in ISRO's 2025 Missions:** As ISRO Chairman, Narayanan will oversee the launch of **NVS-02** for India's navigation system, lead the **unmanned Gaganyaan mission** with **Vyommitra**, and the **Indo-US NISAR satellite** launch in March 2025.
- **Contributions of Dr. S. Somanath:** Led **Chandrayaan-3**, **Aditya-L1**, **XpoSat**, and **INSAT missions**.
 - Spearheaded **Small Satellite Launch Vehicle (SSLV)**, **Re-usable Launch Vehicle (RLV-LEX)** and **Gaganyaan abort missions**.
 - As Secretary of DoS, initiated **National Space Policy 2023, IN-SPACe**, and fostered collaboration with ISRO and private ventures.

- **ISRO:** Formed on 15th August 1969, succeeded **Indian National Committee for Space Research (INCOSPAR)**, which was established in 1962 under **Dr. Vikram Sarabhai** to advance space technology for national development.

- In 1972, India formed the **Space Commission** and established the **DoS**, bringing ISRO under its control.
- The Secretariat of DOS and ISRO headquarters are located at Antariksh Bhavan in Bangalore.

Read more: [New ISRO Chairman S. Somanath](#)

UDISE+ Report 2023-24

The **Unified District Information System for Education (UDISE) Plus report** shows a significant **decline in India's school enrolment**, linked to revised data collection methods.

Key Findings:

- **Decline in Enrolment:** Enrolment fell from **26.36 crore** (2018-2022 average) to **25.17 crore** in 2022-23 and **24.8 crore** in 2023-24, a drop of **1.55 crore** students.
 - **Government** school enrolment dropped by **5.59%**, and **private** school enrolment fell by **3.67%**.
- **Gender-wise Trends:** Enrolment of **boys declined by 6.04%** and **girls by 5.76%**, compared to the 2018-19 to 2021-22 average.
- **State-wise Declines:** Largest declines recorded in **Bihar (35.65 lakh)**, **Uttar Pradesh (28.26 lakh)**, and **Maharashtra (18.55 lakh)**.
- **Level-wise Trends:** Decline observed across **primary, upper primary, and secondary levels**.
 - Enrolment in **pre-primary and higher secondary levels rose** in 2023-24 compared to the previous average.
- **Improved Data Accuracy:** **Aadhaar**-linked student records improved data accuracy by removing duplicates, including students enrolled in both government and private schools.

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Note:

- **About UDISE+:** It is one of the largest **Management Information Systems** by the **Ministry of Education**, covering 14.72 lakh schools, 98.08 lakh teachers, and 24.8 crore children.

Read More: [UDISE Plus Report](#), [Smart Classrooms Under the Smart Cities Mission](#)

Inauguration of Jammu and Rayagada Railway Division

Recently, **Prime Minister (PM)** virtually inaugurated the **new Jammu Railway Division**, India's 70th division, carved from the **Firozpur Division**, covering 742.1 km.

- He also inaugurated the **Cherlapally terminal station in Telangana** and laid the foundation stone for the **Rayagada railway division (69th Division) building** in Odisha under the **East Coast Railway zone**.
- Indian Railways now has **17 zones** and **70 divisions**.
- **New Jammu Railway Division:** Jammu Railway Division has been carved from the **Firozpur Division** and covers **742.1 km**.
 - A new **Katra-Reasi railway section** and **Vande Bharat train services to Srinagar** will also start from 26th January 2025.
- The PM highlighted ongoing efforts in expanding **metro networks**, **dedicated freight corridors**, alongside initiatives such as **solar-powered stations** and the **development of high-speed rail systems**.
- About Indian Railways:
 - It was established in **1853** and is **one of the largest railway networks globally**.
 - The **first train in India** ran over a distance of 21 miles, connecting **Bombay and Thane**.
 - India has the **3rd largest metro-rail network** in the world after **China and the US**. By 2050, India is projected to account for **40% of the global rail activity**.

Vande Bharat Express salient features:

- India's first indigenous semi-high speed 160 kmph train set
- Reclying ergonomic seats & comfortable seating with revolving seats in executive class
- Intelligent regenerative braking system, faster acceleration & deceleration
- Driver cabin at both ends eliminates need for locomotive reversal
- Better ride comfort, Fully Sealed gangways for free passenger movement
- Mobile charging sockets for every seat
- Better fire safety, Emergency alarm, push buttons & Talk-back units
- Aircraft-style bio-vacuum toilets, CCTVs, diffused LED lighting in all coaches
- KAVACH indigenously developed anti-train collision system
- Mini Pantry, Automatic plug doors for entry & exit
- GPS based audio-visual passenger information system, on-board hotspot Wi-Fi
- Better heat ventilation & AC control through higher efficiency compressor, with UV lamp for germ-free air



Read More: [India's Journey of Infrastructure Development](#)

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Note:

India's First Organic Fisheries Cluster in Sikkim

The Ministry of Fisheries, Animal Husbandry & Dairying launched India's first organic fisheries cluster in Soreng District, Sikkim under the [Pradhan Mantri Matsya Sampada Yojana \(PMMSY\)](#).

- **Organic Fisheries Cluster:** It aims to produce antibiotic, chemical, and pesticide-free organic fish for eco-conscious markets globally.
 - The initiative promotes sustainable aquaculture and ecologically healthy fish farming, preventing pollution and damage to aquatic ecosystems.
 - [National Bank for Agriculture and Rural Development](#) will fund infrastructure, build capacities, and form Fisheries-based Farmer Producer Organizations (FFPOs) to support the cluster.
- **Sikkim a Organic State:** Sikkim becomes India's first fully organic state, with 75,000 hectares of land converted to certified organic practices under the [National Programme for Organic Production](#).
- **PMMSY:** Aims to develop the fisheries sector through sustainable practices with an investment of Rs 20,050 crores.
 - It focuses on enhancing fish production, infrastructure, and marketing while ensuring the welfare of fishers and fish farmers.
 - The scheme is being implemented across India from FY 2020-21 to FY 2024-25 by the Department of Fisheries.

Read more: [Pradhan Mantri Matsya Sampada Yojana](#)

358th Birth Anniversary of Guru Gobind Singh Ji

Recently, the Prime Minister paid tributes to Guru Gobind Singh Ji, the 10th Sikh Guru, on his 358th birth anniversary, celebrated as Prakash Utsav ([Prakash Parv](#) is celebrated on the birth anniversary of [Guru Nanak Dev Ji](#)).

- His birth anniversary is based on the [Nanakshahi calendar](#) (follows the solar year) according to which it will fall on 6th January in 2025.
- **About Guru Gobind Singh Ji:**
 - **Early Life:** He was born on 22nd December 1666, in Patna Sahib, Bihar. He succeeded his father, [Guru Teg Bahadur](#), the 9th Sikh Guru.
 - **Contributions:** He established the [Khalsa](#) in 1699, a warrior community dedicated to protecting faith and justice.
 - Introduced the **Five K's** as symbols of Sikh identity i.e., **Kangha** (comb), **Kesh** (uncut hair), **Kara** (steel bracelet), **Kirpan** (sword), and **Kachhera** (shorts).
 - His sons **Zorwar Singh (age 7)** and **Fateh Singh (age 9)** were executed by Sarhind's governor **Wazir Khan** after they refused to convert to Islam.
 - His two elder sons **Ajit Singh** and **Jujhar Singh** sacrificed their lives in the [Battle of Chamkaur \(1705\)](#) where a small Sikh force fought the Mughals and hill kings.
 - 26th December is observed as '[Veer Bal Diwas](#)' to mark their martyrdom.
 - **Panj Pyare:** Guru Gobind Singh established the institution of **Panj Pyare** where he asked for five heads for sacrifice and five men willingly responded to his call.

Read More: [Sikhism](#)

BHARATPOL Portal

The Union Home Minister of India launched the 'BHARATPOL' portal to enhance the efficiency of [Indian investigation agencies](#) in tracking fugitives and facilitating faster international assistance.

- **BHARATPOL Portal:** Developed by the [Central Bureau of Investigation \(CBI\)](#), the portal allows central and state agencies to connect with the [International Criminal Police Organization \(INTERPOL\)](#) for real-time information sharing, replacing the previous system where only the CBI had this access.
 - BHARATPOL streamlines international assistance to tackle rising transnational crimes like [cybercrime](#), [drug trafficking](#), and [human trafficking](#).

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Note:

- The portal will enhance the processing of Red Notices and other INTERPOL notices, making it easier for **field-level police officers** to address crimes.

- **Capacity Building:** The CBI is tasked with training states on using BHARATPOL and implementing the three new criminal laws for effective trials.

Read more: [Notices of Interpol](#)

78th Foundation Day of Bureau of Indian Standards

Recently, the **Bureau of Indian Standards (BIS)** celebrated its **78th Foundation Day** on 6th January 2025.

- **About BIS:** BIS is the **statutory national standard body** of India established under the **BIS Act, 2016** for the **harmonious development** of the activities of **standardization, marking and quality certification** of goods.
 - It was initially set up as the **Indian Standards Institution (ISI)** that came into being on 6th January 1947.
 - It functions under the **Ministry of Consumer Affairs, Food, and Public Distribution**.
- **Functions:** It operates various schemes like **Product Certification (ISI mark)**, **Hallmarking** of Gold and Silver Jeweller, **ECO Mark Scheme** (for labeling of environment friendly products).
- **Standards National Action Plan (SNAP) 2022- 27:** It serves as a **strong foundation for standardization** to meet the emerging technologies and concerns of sustainability and climate change.
 - It will be **pivotal** in enriching and strengthening "Quality Culture" in the Nation.
- **Achievements:** **94%** of Indian standards have been harmonised with the **International Organisation for Standardisation (ISO)** and the **International Electrotechnical Commission (IEC)** standards.
 - Over **44.28 crore** articles of **gold, jewellery/artefacts** have been hallmarked so far.

Read More: [Bureau of Indian standards \(BIS\) Act, 2016](#)

193rd Birth Anniversary of Savitribai Phule

Recently, the **Prime Minister** paid tributes to **Savitribai Phule** on her **193rd birth anniversary** on 3rd January 2025.

- Savitribai faced strong **opposition from orthodox society**, enduring physical and social assaults, including being **stoned and abused**.
- **About Savitribai Phule:**
 - **Born:** She was born on **3rd January 1831**, in Satara, Maharashtra, to a marginalized **Mali community**. She was married to **Jyotiba Phule** who took charge of her education.
 - She was enrolled in **two teacher's training programs**: one with **American missionary Cynthia Farrar** in Ahmednagar and the other at a **Normal School, Pune**.
 - **Contributions:**
 - **Education for Women:** Established the first school for girls in **1848** in **Pune**. The couple started and ran **18 schools in total**.
 - **Efforts for Downtrodden:** Started educational trusts like the **Native Male School, Pune** and **Society for Promoting the Education of Mahar, Mangs** to uplift the Dalit community.
 - **Combating Gender Issues:** In **1863**, Jyotirao and Savitribai founded **Balhatya Pratibandhak Griha**, India's first home to combat **female infanticide** and support **pregnant Brahmin widows and rape victims**.
 - **Literature:** Authored two famous works namely **Kavya Phule (1854)** and **Bavan Kashi Subodh Ratnakar (1892)** in, along with the poem **Go, Get Education**.
- **Jyotirao Phule**, a 19th-century **social reformer**, critiqued social oppression in his book **Gulamgiri** and founded the **Satyashodhak Samaj** in **1873** to promote education, equality, and **abolish untouchability**.

Read More: [Savitri Bai Phule](#)

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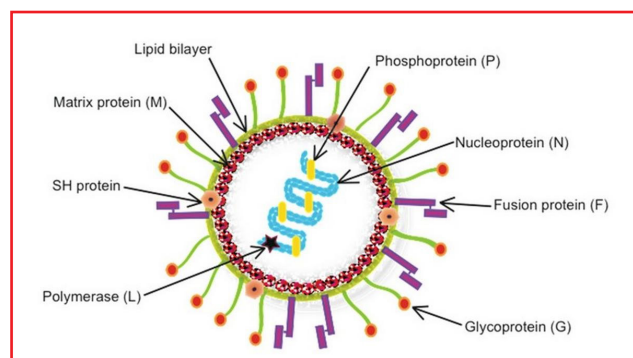


Note:

HMPV Virus

The recent surge in **respiratory illnesses in China**, linked to **Human Metapneumovirus (HMPV)**, has sparked fears of another pandemic.

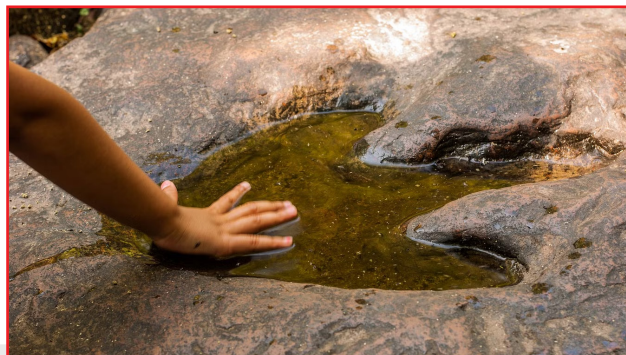
- However, the **World Health Organization (WHO)** has **not** reported a **new pandemic**, issued emergency warnings, or declared a health crisis related to HMPV.
- **About HMPV:**
 - **Discovery:** It was **discovered in 2001** by researchers in the **Netherlands**. It causes acute respiratory infections, similar to **flu and Covid-19**.
 - **Presence:** It is not limited to **China** and is found **all over the world**. It is clubbed as a **common respiratory pathogen**. It does **not** have a **vaccine**.
 - **Symptoms:** **Cough, fever, sore throat, runny nose, and wheezing**, which typically resolve within **2-5 days**.
 - **Vulnerable Groups:** **Children, the elderly**, and those with **weakened immune systems** are most at risk of complications like **pneumonia**.
 - **Transmission:** HMPV spreads through **close contact** or by **touching contaminated surfaces**.
 - **Seasonality:** It commonly circulates during **winter and spring**, along with other respiratory infections like **Respiratory Syncytial Virus (RSV)** and **influenza**.
 - HMPV belongs to the **Pneumoviridae** family, which includes **RSV, measles, and mumps viruses**.
 - **Severity:** While most HMPV cases are mild, a **small percentage (5-16%)** may develop into severe conditions like **bronchiolitis or pneumonia**.



Read More: [Impact of Covid-19 on Human Capital](#)

Dinosaur Highway

Recently, hundreds of **dinosaur footprints**, dating back to the **Middle Jurassic Period** (around 166 million years ago), were discovered at **Dewars Farm Quarry in Oxfordshire, UK**, earning the site the nickname “**dinosaur highway**” due to the large number of footprints found.



- The footprints include **Sauropods**, large herbivores like **Cetiosaurus** (up to 60 ft), and **Megalosaurus**, a 30-ft carnivore with triple-claw prints.



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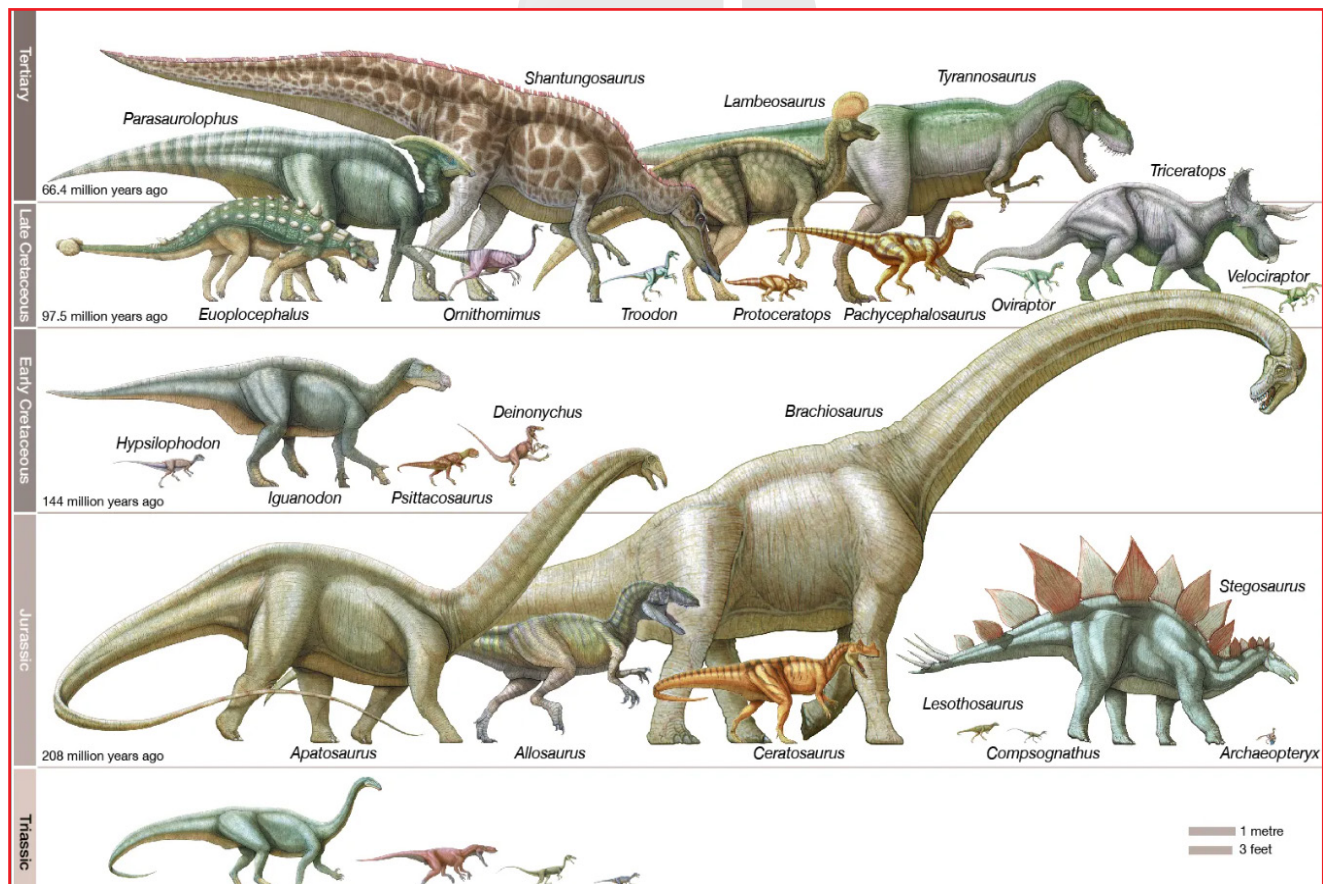


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Note:

- **Dinosaurs:** Dinosaurs were **prehistoric reptiles** that lived from about **245 million years ago** to **66 million years ago** during the **Mesozoic Era** (Triassic, Jurassic, Cretaceous periods).
 - Modern birds are descendants of non-avian dinosaurs.
- **Classification:**
 - **Ornithischia:** Beaked plant-eaters (e.g., Stegosaurus, Triceratops).
 - **Sauropodomorpha:** Long-necked herbivores (e.g., Diplodocus).
 - **Theropoda:** Carnivores (e.g., T. rex, Velociraptor), ancestors of birds.
- **Size:** Dinosaurs ranged from massive species like **Argentinosaurus (110 tons)** to small ones like the **bee hummingbird**.
- **Diet and Movement:**
 - **Meat-eaters:** Two-legged, hunted alone or in groups.
 - **Plant-eaters:** Two or four-legged, grazed on plants.
- **Distinctive Feature:** The key feature distinguishing dinosaurs from other reptiles is the **hole in the hip socket, allowing upright walking**.
- **Extinction:** Dinosaurs went extinct around, likely due to an **asteroid impact** in the **Cretaceous period**, creating a crater in the **Yucatan Peninsula (Mexico)**.



Read More: [Connection Between Dinosaurs and Birds](#)

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Note:

Department of Scientific and Industrial Research

The Department of Scientific and Industrial Research (DSIR) celebrated its 40th Foundation Day on 4th January 2025, marking four decades of contributions to India's scientific and industrial development.

- **DSIR:** It was established on 4th January 1985, under the **Ministry of Science and Technology** through a **Presidential Notification** under the **164th Amendment of the Government of India (Allocation of Business) Rules, 1961**.
 - DSIR focuses on promoting **indigenous technology development, utilization, and transfer**.
 - DSIR oversees the **Council for Scientific and Industrial Research (CSIR)**, **National Research Development Corporation (NRDC)** and **Central Electronics Ltd (CEL)**.
 - DSIR supports the **Asian and Pacific Centre for Transfer of Technology (APCTT)** under **United Nations Economic and Social Commission for Asia and the Pacific (UN-ESCAP)**, advancing scientific and industrial progress in India.
- **DSIR Key Schemes:**
 - **PRISM: Promoting Innovations in Individuals, Start-ups and MSMEs (PRISM)** scheme supports innovators and MSMEs fostering inclusive development as outlined in the **12th Five-Year Plan (2012-2017)**.
 - **PACE: The Patent Acquisition and Collaborative Research and Technology Development (PACE)** supports industries in developing and commercializing innovative technologies.

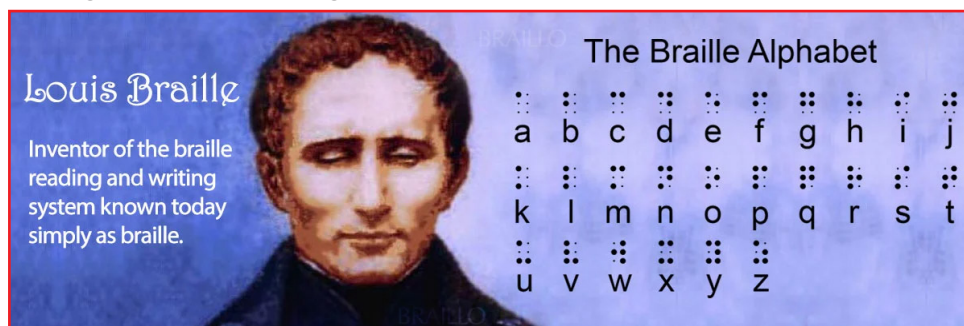
- **CTRDH: Common Research and Technology Development Hubs (CRTDHs)** provides shared infrastructure and technology support for MSMEs.
- **A2K+: Access to Knowledge for Technology Development and Dissemination (A2K+)** promotes the dissemination of tech and innovation information to industries and research bodies.

Read more: [Council of Scientific & Industrial Research \(CSIR\)](#)

World Braille Day 2025

World Braille Day, celebrated on 4th January, commemorates the birth of **Louis Braille**, the inventor of **Braille**, a **tactile code** that empowers **blind and visually impaired** individuals to **access written information**.

- **Louis Braille:** Louis Braille (1809–1852) was born in France, and lost his sight at the age of three.
 - At ten, he received a scholarship to the Royal Institute for Blind Youth in Paris, where he developed the **Braille system** after being inspired by an army captain's "**night writing**" system.
 - The "**night writing**" system, created by **Charles Barbier de la Serre** in 1815, used **12 raised dots** and was designed for soldiers to communicate silently in the dark.
- **Braille System:** It uses 6 raised dots in a **3 × 2 matrix** to form characters, distinguishable by their arrangement.
 - Braille can be written with various tools, including slates, braille writers, and electronic devices.
 - Despite the rise of **Artificial Intelligence (AI)** and voice technologies, Braille remains crucial for independence, especially for those congenitally blind.



Read more: [World Braille Day](#)

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Note:

Panchayat Se Parliament 2.0

Recently, the **Panchayat Se Parliament 2.0** programme was inaugurated by [Lok Sabha Speaker](#) on 6th January 2025, commemorating the 150th birth anniversary of tribal leader [Birsa Munda](#).

- The event witnessed the participation of **502 elected women representatives** from [Scheduled Tribes \(STs\)](#) across India.
 - **Panchayat Se Parliament 2.0 Programme:** A women awareness and empowerment initiative to enhance understanding of **constitutional and democratic values**.
 - Organised by [National Commission for Women \(NCW\)](#) and [Lok Sabha Secretariat](#), in collaboration with the **Ministry of Tribal Affairs**.
 - **Objective:** Empower elected women representatives from diverse backgrounds in [Panchayats \(PRIs\)](#) and [urban local bodies \(ULBs\)](#) by providing them insights into **constitutional provisions, parliamentary procedures, and governance**.
 - **Key Features:**
 - Includes **interactive workshops** by experts and [Member of Parliaments \(MPs\)](#), and guided tours of the **New Parliament House, Samvidhan Sadan, Pradhanmantri Sangrahalaya, and Rashtrapati Bhavan**.
 - **Panchayat Se Parliament Tak 1.0** was conducted in January 2024 with over 500 participants.
 - **Acts for Women Reservation:**
 - [73rd and 74th Constitutional Amendments \(1992 and 1993\)](#)
 - [106th Constitutional Amendment Act, 2023](#)
 - Birsa Munda led the [Munda Rebellion \(Ulgulan\)](#), and his birth anniversary is celebrated as [Janjatiya Gaurav Divas](#).
- Read More: [Janjatiya Gaurav Divas: 15th November](#)

Sree Narayana Guru

Recently, the head of the **Sivagiri Mutt** in Kerala, called for the **abolition of the practice requiring men to remove their upper garments** before entering temples, terming it an “evil” practice.

- He held that the practice, originally introduced to ensure men wore the “**punool**” (**sacred thread worn by Brahmins**), contradicted the social reform principles of [Sree Narayana Guru](#).

Sree Narayana Guru:

- **Birth:** He was born on 22nd August 1856 in Chempazhanthy in Kerala. He belonged to the [Ezhava caste](#), considered ‘avarna’ by the social norms of the time.
 - **Philosophy:** He advocated for **equality, education, and social upliftment, transcending caste distinctions**.
 - His core belief was expressed in the slogan “**One Caste, One Religion, One God for All**”.
 - He became a major proponent of [Advaita Vedanta](#), the **non-dualistic philosophy** introduced by [Adi Shankara](#).
 - **Social Reforms:** He founded the [Sree Narayana Dharma Paripalana Yogam \(SNDP\)](#), a philanthropic society for uplifting marginalized
 - **Aruvippuram Movement (1888):** He installed a Shiva idol at Aravipuram, symbolizing resistance against social injustice, particularly the caste-based restrictions that barred lower castes from temple entry.
 - He established **Sivagiri Mutt** in 1904.
 - **Literary Contributions:** He authored several important works, including *Advaita Deepika*, *Atmavilasam*, *Daiva Dasakam*, and *Brahmavidya Panchakam*.
- Read More: [Sree Narayana Guru](#)

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Note:

Winter Char Dham

Recently, **Uttarakhand** has launched the **Winter Char Dham circuit** to promote **year-round tourism and attract visitors** to the state during the **off-season winter months**.

- **Char Dham shrines** (4 revered shrines) are four holy sites i.e., **Yamunotri, Gangotri, Kedarnath and Badrinath** and are located in the **Garhwal Himalayas**. They are traditionally visited between **May and November**.
 - During the **winter months**, the **presiding deities** of these temples are brought to shrines at **lower altitudes** at:
 - **Kedarnath**: Omkareshwar Temple in Ukhimath (Rudraprayag)
 - **Badrinath**: Pandukeshwar in Chamoli.
 - **Gangotri**: Mukhba in Uttarkashi
 - **Yamunotri**: Kharsali in Uttarkashi
- The **Char Dham Project** aims to enhance **connectivity** to the **Badrinath, Kedarnath, Gangotri, and Yamunotri** by improving conditions of highways.
- **Adi Shankaracharya** (exponent of the **Advaita Vedanta**) established the **Char Dhams** in four different directions of the country which include **Badrinath, Puri, Dwarka and Rameshwaram**.
 - Advaita Vedanta is a **non-dualistic philosophy** that asserts the **ultimate reality (Brahman)** is singular and formless, with **individual souls (Atman)** being **identical to it**, and **liberation (moksha)** is achieved through the **realization of this oneness**.

Read More: [CharDham Project](#)

Hydrogel for Cancer Therapy

Recently, researchers have developed an **injectable hydrogel** for **localised cancer treatment**.

- The hydrogel acts as a **stable reservoir for anti-cancer drugs**, releasing them in a **controlled manner** to target cancer cells while **sparing healthy ones** and reducing side effects.
- The **hydrogel**, made of **biocompatible and biodegradable ultra-short peptides**, responds to elevated **glutathione (GSH)** levels, a molecule abundant in tumour cells.
- The hydrogel ensures **localized drug delivery** to the **tumour site**, improving treatment precision.
 - **Conventional chemotherapy** and surgery harms **healthy cells** while treating cancerous cells.
- Hydrogels are **water-based, three-dimensional polymer networks** capable of **absorbing and retaining fluids**.
 - Their unique structure **mimics living tissues**, making them suitable for biomedical applications.

Read More: [Novel Hydrogel to Remove Microplastics](#)

Property Restoration under MWPSC Act, 2007

The **Supreme Court's** recent ruling on the **Maintenance and Welfare of Parents and Senior Citizens (MWPSC) Act, 2007** emphasizes the empowerment of tribunals to restore property to parents if their children neglect their care obligations.

- **Section 23 of the MWPSC Act, 2007** allows tribunals to declare property transfers void if the **transferee fails to provide agreed-upon basic needs**.
 - If a senior citizen cannot enforce these rights, an authorized organization (tribunals) can act on their behalf.
- The MWPSC Act, 2007, is administered by the **Ministry of Social Justice & Empowerment**, provides statutory protection for elderly citizens, allowing them to **seek maintenance from children or legal heirs** if they cannot support themselves.

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Note:

- **Key Features of MWPSC Act:** The Act is enforced through **Tribunals and Appellate Tribunals** at district and sub-division levels for efficient processing.
 - Tribunals can levy fines or order imprisonment to individuals who fail to pay maintenance.
 - Abandonment of senior citizens by caregivers results in a fine or imprisonment for up to 3 months.

Read more: [Safeguarding the Rights of Elderly](#)

AICTE's 2025 'Year of AI'

Recently, the [All India Council for Technical Education \(AICTE\)](#) has designated **2025** as the “Year of Artificial Intelligence” to position India as a global leader in AI.

- AICTE aims to promote AI in education through **updated curricula, workshops for faculty, and collaborations with AI-driven companies** for real-world exposure.
 - Core elements of this initiative includes **AI affirmation Pledge, Comprehensive AI integration, AI awareness campaign, Faculty development and industry partnerships, Recognition of excellence.**
- The initiative will affect **over 14,000 colleges and 40 million students**, aiming to integrate AI into higher education and foster innovation and leadership.
- The government launched **AI-enabled tools and safety measures** to enhance consumer protection, including the **National Consumer Helpline, e-maap portal and Jago Grahak Jago mobile application and guidelines** to regulate deceptive marketing in ecommerce.
- The government is focusing on ensuring consumer confidence in the digital market with tools like the [e-Daakhil Portal](#) for online complaint filing and measures to address e-commerce safety concerns.
- **AICTE:**
 - It is a **statutory body**, and a **national-level council for technical education**, under the [Ministry of Education](#).

- It was set up in **November 1945** as a **national-level apex advisory body**

Read More: [New Regulation of AICTE](#)

Inter-State

Translocation of Tigers

Recently, **Madhya Pradesh** has directed the **translocation of 15 tigers** from Madhya Pradesh to **Rajasthan, Chhattisgarh, and Odisha** for conservation purposes.

- The tigers will be **translocated from the Bandhavgarh, Pench, and Kanha tiger reserves** in Madhya Pradesh.
- A total of **12 tigresses and 3 tigers will be moved**, following approval from the [National Tiger Conservation Authority \(NTCA\)](#).
 - The distribution plan includes **six tigresses and two tigers for Chhattisgarh, four tigresses for Rajasthan, and one tiger and two tigresses for Odisha.**
- **Madhya Pradesh has the highest number of tigers in India**, with **785 tigers** according to the [NTCA 2022 report](#).
 - The state has **Nine tiger reserves**, including the newly notified [Madhav Tiger Reserve](#) in Shivpuri District.
- Translocation is a strategy to enhance genetic diversity in tiger populations by introducing new individuals to isolated groups, reducing inbreeding risks and supporting long-term species survival.
 - It serves as a **reinforcement strategy**, aimed at **increasing the genetic diversity** of existing tiger populations.

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Note:

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)



Read More: [Tiger Translocation for Genetic Diversity](#)

MoU Between CENJOWS and NDMA

Recently, The Centre for Joint Warfare Studies (CENJOWS) has signed a MoU with the [National Disaster Management Authority \(NDMA\)](#) to enhance India's disaster management capabilities.

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Note:

- The partnership aims to **address critical challenges in disaster mitigation**, preparedness, and response through a **'whole of the nation'** approach.
- **Framework for Joint Initiatives:**
 - **Collaborative Research:** Joint studies on disaster management and **humanitarian assistance and disaster relief (HADR)** operations to provide policy inputs to the government.
 - **Capacity Building:** Organizing seminars, workshops, and training programs for stakeholders, including armed forces personnel and NDMA officials.
 - **Awareness Campaigns:** Promoting disaster preparedness and risk mitigation through nationwide initiatives.
 - **International Engagements:** Facilitating global collaboration on disaster management aligned with **India's foreign policy objectives**.
- **CENJOWS** was established by the **Ministry of Defence** in **2004**, and is registered under the **Societies Registration Act of 1860**.
 - CENJOWS seeks to promote **jointness as a driver of Comprehensive National Power** by offering **research-based alternatives** and fostering debates to aid doctrinal and policy formulation for stakeholders.
- **NDMA:**
 - It was **established in 2006 under the Disaster Management Act, 2005**, and is India's apex statutory body for disaster management.
 - It is chaired by the **Prime Minister** and includes **nine members**, one serving as **Vice-Chairperson**.

Read More: [National Disaster Management Authority \(NDMA\)](#)

Thanthai Periyar Memorial

Recently, Kerala and Tamil Nadu Chief Ministers inaugurated the renovated **Thanthai Periyar memorial in Vaikom**, a significant site commemorating the contributions of Tamil reformist **E.V. Ramasami Naicker**, popularly known as **Thanthai Periyar**.

- The memorial honors **Thanthai Periyar**, who played a pivotal role in the **Vaikom Satyagraha**, recognized as the **first organized** movement for the rights of the **'untouchable'** communities in India in **April 1924**.

- Periyar's activism led to his imprisonment twice for his involvement in the movement, earning him the **title Vaikom Veeran**.
- The renovated memorial includes a **new library** and a **wealth of materials** detailing Periyar's biography, **history of the Dravidian movement**, and his interactions with prominent leaders.
- Contributions of Periyar:
 - The **Vaikom Satyagraha**, a peaceful protest held in Vaikom, Kerala, from **30th March 1924 to 23rd November 1925** was led by visionary leaders **T.K. Madhavan, K.P. Kesava Menon, and K. Kelappan**.
 - He started the **Self-Respect Movement and Dravidar Kazhagam** and is known as the **'Father of the Dravidian movement'**.



Read More: [100 Years of Vaikom Satyagraha](#)

Indo-Pak Exchange of Nuclear and Prisoner Lists

Recently, India and Pakistan exchanged lists of **nuclear installations** and shared details of **prisoners and fishermen**, despite ongoing strained diplomatic ties.

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Note:

- The exchange of lists of **prisoners and fishermen** is mandated by the [Agreement on Consular Access, 2008](#) occurring biannually on **1st January** and **1st July**.
- The exchange of **nuclear installation** lists occurred under the [Agreement on the Prohibition of Attack against Nuclear Installations, 1988](#).
 - This was the **34th consecutive** exchange, with the first on **1st January, 1992**.
 - This agreement, signed on **31st December, 1988**, and effective from **27th January, 1991**, requires India and Pakistan to exchange nuclear installation details **annually on 1st January**.
 - However, **neither** country discloses **details** of the nuclear installations.
- **Article 36** of [Vienna Convention on Consular Relations, 1963](#) mandates that foreign nationals arrested or detained must be **promptly informed of their right to have their embassy or consulate notified**.

Read More: [Consular Access: Kulbhushan Jadhav](#)

Case

Polar Sundial at VSSC

Recently, a polar **sundial** designed by the [Vikram Sarabhai Space Centre \(VSSC\)](#) has been showcased in the 'Rocket Garden' at the **Space Museum in Thumba, Kerala**.

- This sundial serves as an **educational tool**, demonstrating **complex astronomical concepts** in a visually engaging manner.
- **Key Features:**
 - The sundial features **analemmatic correction**, allowing it to **accurately display Indian Standard Time (IST)** and the date.
 - Unlike conventional sundials, this sundial **replaces straight hour lines with inverted analemma curves**, automatically **converting local solar time to mean solar time** throughout the year.
 - The **analemma correction** is based on the **figure-eight pattern** made by the **sun** in the sky over the course of a year, caused by **Earth's tilt and elliptical orbit**.

- The sundial is designed with a **polar configuration**, where the **sundial plate is aligned parallel to the Earth's polar axis** and affixed to a wedge-shaped structure **based on the latitude of Thumba**.
- The sundial features a **1.6 ft tall, 3D-printed miniature of the Rohini series RH200 sounding rocket**.



Read More: [Vikram Sarabhai Centenary Programme](#)

Mount Kanlaon

Mount Kanlaon, a **2,435-meter active volcano** in the Philippines, recently erupted, releasing ash and gases.

- Mount Kanlaon is a **stratovolcano** in the **north central part of the island of Negros**.
- The **Philippines** and Mount Kanlaon is located in the **Pacific Ring of Fire**, a region known for its high seismic activity, making it one of the most disaster-prone areas globally.

Volcano:

- A **volcano** (an **endogenic process**) is a weak spot in the earth's crust where gases, lava, ash, and steam are expelled during an eruption.

Pacific Ring of Fire:

- The **Ring of Fire**, or **Circum-Pacific Belt**, is a **seismic zone** around the **Pacific Ocean** known for **active volcanoes** and **frequent earthquakes**, caused by interactions between the **Pacific Plate** and surrounding less-dense plates.
- The **Ring of Fire** spans about **40,000 kilometers**, marking the boundaries of tectonic plates such as **Pacific, Juan de Fuca, Cocos, Indian-Australian, Nazca, North American, and Philippine Plates**.

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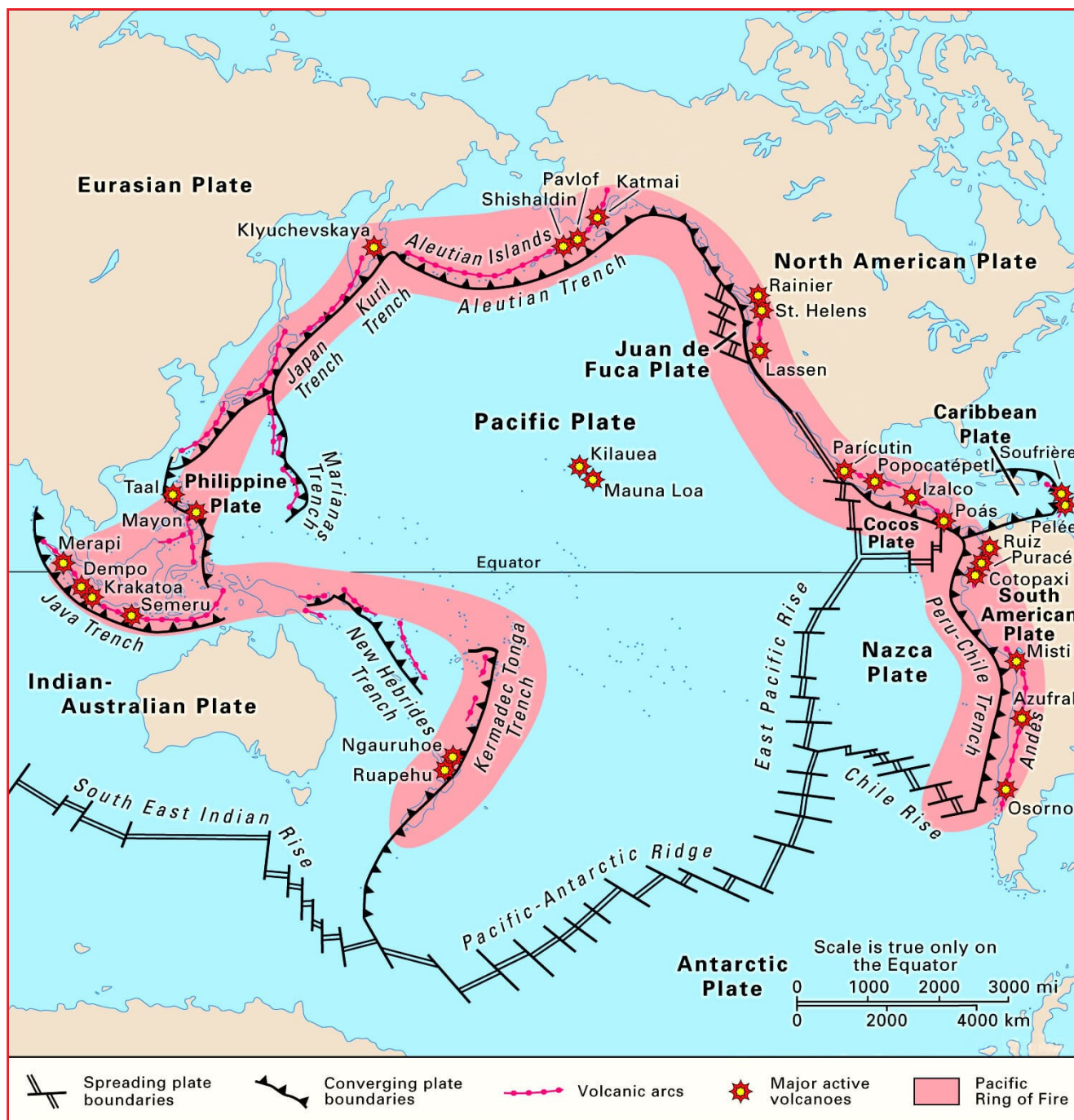
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Note:



Read More: [Volcanism](#)

NPCI Extends Market Cap Deadline for UPI Apps

Recently, the [National Payments Corporation of India \(NPCI\)](#) extended the deadline for [Third-Party App Providers \(TPAPs\)](#) to comply with the 30% transaction cap on [UPI](#) transaction volumes till 31st December, 2026.

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Note:

- This decision impacts major TPAPs like PhonePe and Google Pay, which collectively hold over 80% of UPI transactions.
 - To comply with the 30% cap, TPAPs exceeding the limit must halt onboarding new customers.
- **Background:** In November 2020, NPCI introduced a cap of 30% on UPI transaction volumes per TPAP to mitigate concentration risks and ensure a balanced ecosystem. However, the deadline was extended in December 2022.
 - The cap is based on the average UPI transaction volume over the past three months, with existing TPAPs exceeding the cap given two years to comply in phases.
- **NPCI:** It was established by RBI and Indian Banks' Association under the provisions of the Payment and Settlement Systems Act, 2007.
- **TPAPs:** They are entities that offer UPI-based financial services through mobile apps or platforms, acting as intermediaries between users and banks (referred to as sponsor banks).
 - TPAPs are not part of banks or financial institutions.

Read More: [UPI Payments: Empowering Users, Challenging Banks](#)

Advocates of Supreme Court

Recently, concerns have been raised over the quality of newly designated Senior Advocates, with 116 joining the Supreme Court (SC) in 2024.

- **Senior Advocates:**
 - **Designation:** Awarded by the SC or High Courts based on legal acumen, standing at the Bar, and special knowledge after at least 10 years of experience.
 - **Role:** They argue legal propositions but cannot take direct instructions from clients and are briefed by an Advocate-on-Record (AoR).
 - Senior Advocates are key legal figures in the Supreme Court, handling high-stakes cases like death penalties, company liquidations, child custody, and bail applications.

- **Restrictions:** Senior Advocates cannot directly take clients or engage in certain legal tasks like drafting pleadings, drawing affidavits, or advising on evidence.
- **2017 Reforms:** The SC established objective criteria for designating Senior Advocates following a public interest litigation by Indira Jaising, the first woman Senior Advocate of the Bombay High Court.
 - These criteria include judgments, academic contributions, and experience, aiming to make the process more transparent and inclusive.
- **Advocates-on-Record:** They are the only advocates authorized to file documents, represent parties, and file appearances in the SC.
- **Other Advocates:** These advocates are listed on the State Bar Council rolls and can argue cases in the SC but cannot file documents (not involved in formal filings).

Read More: [BCI Allows Foreign Lawyers to Practice in India](#)

Memorials for Leaders

Recently, the cremation of former Prime Minister (PM) Manmohan Singh was held at open-to-public Nigambodh Ghat, a departure from previous practices of cremating at designated sites followed by the establishment of memorials.

- **Rules and Conventions:** Although there are no specific rules mandating memorials for former PMs, they were generally cremated at designated sites, and most have memorials in Delhi or elsewhere.
- **Origins and Legacy of Memorials:** Raj Ghat (Mahatma Gandhi) set the precedent for leader memorials, signifying peace and national unity.
 - Leaders like Jawaharlal Nehru (Shanti Van), Lal Bahadur Shastri (Vijay Ghat), Indira Gandhi (Shakti Sthal) and Atal Bihari Vajpayee (Smriti Sthal) followed the tradition of memorials symbolizing their legacies.
- **Political Ideologies:** Memorials often reflect political ideologies, for instance, P.V. Narasimha Rao's Gyan Bhumi was established by the current NDA government

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after being previously denied by Congress, while **VP Singh** remains the only former PM without a memorial.

- **Maintenance of Memorials:** Memorials are primarily maintained by **State Governments, local municipalities, and occasionally the Central Government** through the Ministry of Urban Development.
- **Memorials Across India & Symbolism:** **Rajendra Prasad (Bihar), B R Ambedkar (Mumbai), Morarji Desai (Ahmedabad)** and **Gulzarilal Nanda- Interim PM (Ahmedabad)**.
 - Memorial names reflect leader identities, e.g., **Shastri's Vijay Ghat (victory), Indira's Shakti Sthal (strength), and Charan Singh's Kisan Ghat (farmer leadership)**.

Read More: [Dr. Manmohan Singh, PM Dedicates Salt Satyagraha Memorial to Nation](#)

Moldova and Transnistria

Recently, **Ukraine has stopped the transit of Russian gas through its territory, ending a major supply route to Europe** after a prewar transit deal expired in December 2024.

- It led to an **energy crisis in Moldova and Transnistria** which heavily relies on Russian gas for power supply and heating amid winter.
- **Moldova:**
 - Moldova is a small **eastern European landlocked country** bordered by **Ukraine to the east and Romania to the west**.
 - Recently, Moldova has inaugurated its **embassy in New Delhi**.
 - India and Moldova established diplomatic relations in 1992 following Moldova's independence after the Soviet Union collapsed in 1991.
- **Transnistria:**
 - It is a **Russian-backed breakaway region in Moldova** described as a "**remnant of the Soviet Union**" that split from the rest of Moldova after the **Soviet Union** collapsed in 1991.

- When Moldovan troops attempted to take over the territory in 1990-1992, Transnistria was able to resist them because of **Russian soldiers based in Transnistria**. Since then, it has remained free of Moldovan control.
 - However, most countries continue to see Transnistria as part of Moldova. It is not recognized as independent even by Russia.
- Most Transnistrians have **dual citizenship of Russia and Transnistria** or **triple citizenship of Moldova, Transnistria, and Russia**.



Read More: [Russia-Ukraine Conflict](#), [Opening of Moldova's Embassy in India](#), [Transnistria in the Russia-Ukraine War](#)

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Index of Eight Core Industries (ICI)

The combined [Index of Eight Core Industries \(ICI\)](#) recorded a **4.3% growth in November 2024** compared to November 2023.

- The ICI measures the **combined and individual performance** of production of eight core industries viz. **Coal, Crude Oil, Natural Gas, Refinery Products, Fertilizers, Steel, Cement and Electricity**.
 - The eight core industries comprise **40.27%** of the weight of items included in the [Index of Industrial Production \(IIP\)](#).

Industry	Weight (%)	Growth (November 2024)
Refinery Products	28.04%	2.90%
Electricity	19.85%	3.80%
Steel	17.92%	4.80%
Coal	10.33%	7.50%
Crude Oil	8.98%	-2.10%
Natural Gas	6.88%	-1.90%
Cement	5.37%	13.00%
Fertilizers	2.63%	2.00%

- **About IIP:** It is an index that measures **short-term changes** in the **volume of production** across key economic sectors like **mining, electricity, and manufacturing** in India.
 - It is published **monthly** by the [Central Statistical Organisation \(CSO\)](#). Data is released **six weeks** after the reference month.
 - Reflects production changes compared to a **base year (2011-2012)**.

Read More: [Core Sector Industries](#)

Birth of the Commercial Internet

On **1st January 1983**, the transition from **Advanced Research Projects Agency Network (ARPANET)** to **Transmission Control Protocol/Internet Protocol (TCP/IP)** marked the birth of the modern Internet, revolutionizing communication globally.

- ARPANET, the **first public packet-switched computer network**, was initiated during the **Cold War** by the **US Department of Defence** to ensure **communication survival** during potential **nuclear attacks**.
 - However, the protocol governing ARPANET, known as the **Network Control Protocol (NCP)**, became outdated by the late 1970s, unable to support the **increasing complexity and diversity of interconnected networks**.
- TCP/IP, developed by **Vinton Cerf and Robert Kahn**, American Internet pioneers, standardized communication across diverse networks, enabling **scalable and efficient data transmission**.
 - 1st January 1983, designated as the **“flag day,”** required all ARPANET systems to adopt TCP/IP, leading to the birth of the Internet.
- TCP/IP enabled a **“network of networks,”** breaking geographical, organizational, and technological barriers, allowing for global connectivity.
 - This transition laid the foundation for future advancements, including the [World Wide Web](#), **social media**, and **e-commerce**.

Read more: [All Things Internet](#)

Surya Kiran Military Exercise

The **18th edition** of **Indo-Nepal** joint training Exercise **“Surya Kiran”** between India and Nepal is being conducted at Saljhandi, Nepal in January 2025.

- The 17th edition of the exercise was held in December 2023 in Uttarakhand.



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- **Exercise Surya Kiran:** It is a military exercise conducted **annually** between India and Nepal, **held alternately in both countries**.
- **Objective:**
 - Enhance interoperability between the two armies in **Counter-Terrorism (CT) Operations**, **jungle warfare**, and **mountain operations**.
 - Improve coordination in **Humanitarian Assistance and Disaster Relief (HADR)** under the **United Nations (UN) Charter**.
 - Focus on **operational preparedness**, **aviation aspects**, **medical training**, and **environment conservation**.
- **India-Nepal Relation:** Nepal shares a **1,850 km** border with 5 Indian states: **Sikkim**, **West Bengal**, **Bihar**, **Uttar Pradesh**, and **Uttarakhand**.
 - The **India-Nepal Treaty of Peace and Friendship**, signed in **1950**, forms the foundation of their special bilateral relations.
 - **Koshi Agreement** (1954, revised in 1966), **Mahakali Treaty** (1996) and **Gandak Agreement** (1959, revised in 1964) are the major water-sharing agreements between India and Nepal.

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: [Major Military Exercises of India](#)

Rapid World Championship

Recently, **Grand Master Koneru Humpy** won the **2024 FIDE (International Chess Federation) World Rapid Championship** in **New York**, marking an exceptional year for Indian chess.

- **Koneru Humpy** defeated **Irene Sukandar of Indonesia** in the final **and** became the **1st Indian and only the 2nd player** after China's Wenjun Ju to win the women's rapid world title **more than once**.
 - Humpy won her **first World Rapid title in 2019 in Georgia**.
 - She won a **bronze in the 2012 World Rapid Championship** and **2nd place in 2023** in **Uzbekistan**.
- Previously, **D Gukesh** became the **youngest world champion** after defeating **Ding Liren** (China) in the **World Chess Championship 2024** in **Singapore**.
- 2024 also saw India's victory in both the **open and women's sections** of the **Chess Olympiad** in **Budapest**.
- In the **World Rapid Championship**, each round has a **time control of 15 minutes**, with **10-second increments per move**.

Read More: [The Rising Popularity of Chess in India](#)

Vembanad Lake

The Alappuzha district administration in Kerala will launch a **mega plastic cleaning drive** as part of the **Vembanad lake rejuvenation project**. This initiative aims to restore the **health of the lake**, a **Ramsar site** and India's **second-largest wetland system**.

- Additional efforts include establishing a **bio-shield**, setting up a **Vembanad Lake Interpretation Centre**, a **yarn museum**, **bottle booths**, promoting **community tourism**, and stocking **fish seeds**.
 - **Awareness programmes** will be held for **fishers**, **houseboat employees**, and local residents to emphasize the importance of lake conservation.
- A 2023 study revealed the degraded state of Vembanad lake, impacting the livelihoods of around eight million people. The lake's water retention capacity has declined by **85.3% from 1990 to 2020**.
- **Vembanad Lake:** Vembanad is the **largest lake in Kerala and the longest lake in India**.
 - Vembanad-Kol is the **largest brackish, humid tropical wetland ecosystem** on the southwest coast of India. It is fed by 10 rivers and is typical of large estuarine systems on the western coast.

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Note:

- In 2002, Vembanad was designated as a **Ramsar Wetland of International Importance**.
- It is also included in the **National Wetlands Conservation Programme** by the Government of India.
- **Kumarakom Bird Sanctuary**, also known as the Vembanad Bird Sanctuary, is located on the lake's east coast.

Read more: [Vembanad Lake: Kerala](#)

Shivaji Statue at Pangong Lake

Recently, a statue of **Chhatrapati Shivaji Maharaj** was inaugurated on the banks of **Pangong Tso** at an altitude of **14,300 feet**.

- It was unveiled shortly after India and China completed **disengagement** at **Demchok and Depsang**, ending a **4.5 year border standoff**.
- However, it has **sparked debate** among army **veterans and locals**, with a retired Colonel proposing a statue of **Dogra general Zorawar Singh**, whose **1834-1840**

campaign merged **Ladakh** with the **Dogra kingdom** under **Maharaja Ranjit Singh**.

- **Pangong Tso**: It is an **endorheic lake** in the Himalayas situated at a height of about **4,350 m (14,270 ft)**.
 - It is one of the **world's highest brackish water lakes**, formed as a **tectonic lake** during the collision of the **Indian plate with the Eurasian plate**.
 - This event created the Himalayas and led to the lake occupying the space of the **Tethys Ocean**.



Read More: [Chinese Bridge on Pangong Lake](#)

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