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940017 Civil Services Marksheet  
Scanned Time & Date: 08/28/2024 08:17:00 (Tue, 28-Jul-2024)

UNION PUBLIC SERVICE COMMISSION  
MARKSHEET

Civil Services (PRELIMINARY) Examination, 2016	
Roll Number	0029983
Name	SANTOSH PANDEY
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REMARKS : QUALIFIED FOR CS(MAIN) EXAMINATION, 2016

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**SANTOSH SIR**  
**CRACKED ALL 6 PRELIMS**



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ISHITA KISHORE  
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Roll Number	6029883
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REMARKS : QUALIFIED FOR CE(MAIN) EXAMINATION, 2016

- NCERT BOOK TEST - 10
- ADVANCE BOOK TEST - 15
- MONTHLY CURRENT AFFAIRS TEST - 15
- ENTIRE YEAR IMP QUESTION TEST (SUBJECT-WISE) - 8
- OPTIMA FULL LENGTH STIMULATED TEST - 7
- CSAT FULL LENGTH TEST - 10
- WEEKLY CURRENT AFFAIRS SESSION - 100 HRS
- STATIC MAP SESSIONS - 50 HRS
- TOTAL NO. OF TEST - 65**



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## PRELIMS 2024

# How I predicted more than 60 Qs

Santosh Sir  
All 6 Prelims Qualified  
4 Mains Qualified  
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UNION PUBLIC SERVICE COMMISSION MARKSHEET	
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# What do our CSE 2022 TOPPER say?

Thank you sir.

The [DPN notes](#) were very comprehensive and useful. I used it to supplement my newspaper knowledge. It really helped in dealing with the current affairs portion of the prelims exam, since you compile it from so many sources.

Would recommend students to maintain their own digital notes using that source.

After I didn't clear first prelims, I joined your [mains master notes](#) which helped me identify key areas for note making.

Thank you sir for your relentless effort in updating these notes.

They're helpful for the aspirants.



**Ishita Kishore**

AIR 1, CSE2022

Ishita has been a student of  
ONE YEAR LAQSHYA PRELIMS MENTORSHIP  
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## Economy

### SEBI's Uniform Charge Structure for Stockbrokers

**Sub: Economy**

**Sec: Capital MARKET**

The Securities and Exchange Board of India (SEBI) has mandated stock exchanges and other market institutions to **implement a "uniform and equal" charge structure for all stockbrokers, irrespective of the nature of the transaction.**

#### Current Charging Mechanism

- **Volume-Based Charges:** Currently, stock exchanges impose charges on stockbrokers based on the volume of transactions. Higher transaction volumes attract lower per-unit charges.
- **Discrepancy in Charge Collection:** SEBI observed discrepancies in **how charges are collected daily from clients by brokers and how brokers pay these charges monthly to exchanges.** This has led to brokers collecting more in aggregate than they pay.

#### SEBI's Directive

- **Uniform Charge Structure:**
- All members (stockbrokers) must be charged equally, with no differentiation based on transaction volume or activities.
- **True Label Charges:**
- Charges recovered from clients must reflect the actual charges imposed by the exchanges.
- End clients should benefit from reduced charges starting from the per-unit level.

#### Impact on Stockbrokers

- **Revenue Streams:**
  - The difference **between charges paid to exchanges and those recovered from clients is a significant revenue stream for brokers.** SEBI's directive could impact this revenue stream.
  - The impact will vary among brokers depending on their reliance on this income.
- **Specific Cases:**
  - **Zerodha:** Currently earns about 10% of its revenue from this difference. Might have to introduce brokerage fees for equity trading, which is currently free, due to the potential loss of revenue.
  - **Geojit Financial:** Reported that the difference income constitutes a minor part of their total income and profit. Expects an increase in brokerage rates offered by discount brokers.

#### Stockbrokers and Their Brokerage Charges



Stockbrokers are intermediaries that facilitate the buying and selling of securities (such as stocks, bonds, and mutual funds) on behalf of investors. *They provide various services, including executing trades, providing investment advice, and managing client portfolios. Brokerage charges are the fees that brokers charge for their services.*

## S&P 500's 7 Shooting Stars

**Sub: Eco**

**Sec : Capital markets**

### High Interest Rates and Stock Performance:

- **Typical Correlation: Historically high interest rates are generally associated with poor stock performance.**
  - Reason: Higher interest rates lead to higher borrowing costs and lower business profits.
  - Risk-Free Rate Impact: As the risk-free rate rises, the expected return on equities also rises, adding downward pressure on stock prices.

### Current Scenario:

- Unusual Trend: Despite a rise in U.S. interest rates to 5.5% (the highest in over 20 years), the S&P 500 has shown a remarkable return of 24.5% over the past 12 months.
- Key Drivers: This unexpected performance is driven primarily by the “magnificent seven” tech giants: Nvidia, Microsoft, Apple, Alphabet, Amazon, Meta, and Tesla.

### Performance Analysis:

- **Magnificent Seven:**
  - **Nvidia: Posted an extraordinary rally of over 172% in the past year.**
  - **Meta: Achieved a 59% increase.**
  - **Amazon: Saw a 45% increase.**
  - **Alphabet: Recorded a 50.5% increase.**
- **Overall Impact: These companies significantly inflated the S&P 500's overall return.**

### S&P 500 vs. S&P 500 Equal Weight Index:

- Equal Weight Index: This index, which gives equal weight to all constituents regardless of market cap, posted a more modest return of 10.7%.
- **Weighting Methodology:**
  - Free-Float Market Capitalisation-Weighted: The S&P 500 gives more weight to companies with larger market caps.
  - Positive Feedback Loop: Successful companies attract more passive investment flows, further boosting their stock prices.

### Sector Performance:

- **Lagging Sectors:** Most sectors, particularly those dependent on interest rate cycles like real estate, posted poor returns.
- **Tech and AI Focus:** Chip-making and technology companies have outperformed due to the positive attention surrounding artificial intelligence (AI).

### AI Investment Caution:

- **Critical Questions: Despite advancements in generative AI, investors should exercise caution.**
  - **High Costs:** AI capacity is expensive to build, implement, and run.
  - **Lack of Network Effects:** Unlike social media platforms, AI does not currently benefit from network effects.
  - **Uncertain Use Cases:** The actual use case and long-term value proposition of AI technology remain unclear.

## SEBI's Proposal for a New Investment Product Between Mutual Funds and PMS

**Sub: Eco**

**Sec: Capital markets**

### SEBI's New Proposal:

- **Introduction:** SEBI is considering a new investment product that lies between mutual funds (MFs) and portfolio management services (PMS).
- **Objective:** To provide investors with a new avenue to diversify their portfolios by investing in various asset classes, including equities, bonds, and their derivatives.

### Understanding Asset Classes and Investment Strategies

1. **Asset Classes:**
  - **A group of securities with similar characteristics, market behavior, and regulations.**

- **Primary Asset Classes:**
  - **Equities:** Shares of companies listed on stock exchanges.
  - **Bonds:** Interest-bearing securities from governments, municipalities, or corporations.
  - **Real Estate:** Physical properties like land and buildings.
  - **Commodities:** Physical goods such as gold, oil, and agricultural products.
  - **Currencies:** Investments in foreign currencies.
- **Alternative Asset Classes:**
  - **Private Equity:** Investments in shares of unlisted companies.
  - **Hedge Funds:** Investment funds employing various strategies for active returns.
  - **Others:** Includes antiques, collectibles, and other non-traditional investments.

#### Asset Allocation: The Key to Investment Success

- **Asset Allocation:**
  - **Definition:** Dividing an investment portfolio among different asset categories like stocks, bonds, and cash.
  - **Importance:** Crucial for meeting financial goals; the key determinant of investment results.
  - **Strategy Example:** Allocate 60% of savings to equities and 40% to bonds, with further diversification within those classes.

#### SEBI's Proposed Investment Vehicle

- **Positioning:** A new investment product designed to bridge the gap between mutual funds and PMS.
- **Objective:** To offer a diversified investment vehicle giving access to multiple asset classes.
- **Features:**
  - **Diversification:** Reduces risk and enhances returns by investing in a mix of asset classes.
  - **Flexibility:** Offers more personalized strategies compared to mutual funds, yet more accessible than PMS.
  - **Accessibility:** Middle ground for investors wanting more than mutual funds but without the higher entry barriers of PMS.

#### Conclusion

- **Understanding Distinctions:** Knowing the difference between asset classes and investment strategies is crucial.
- **SEBI's Product Aim:** Provide a new, diversified investment option to help achieve financial goals.
- **Investment Strategy:** Choose the right mix of assets and investment vehicles for robust portfolios balancing risk and return.

#### Tax Relief Issues for Non-Bank P-Note Holders in GIFT IFSC

**Subject: Eco**

**Sec: Capital market**

- **Lack of Tax Relief:**
  - The recent Budget **did not extend tax exemptions to non-resident holders of offshore derivatives instruments (ODIs), also known as P-Notes**, issued by non-bank entities in GIFT IFSC (Gujarat International Finance Tec-City International Financial Services Centre).
- **Current Tax Exemption:**
  - **Section 10(4E) of the Income-Tax Act** provides tax exemption to non-resident ODI holders for income from derivative instruments contracted with IFSC banks. **However, this exemption does not apply to non-bank entities issuing ODIs.**
- **Regulatory Changes:**
  - In May, the International Financial Services Centres Authority (IFSCA) permitted non-bank entities, such as broker-dealers and fund managers registered as foreign portfolio investors (FPIs), to issue ODIs in GIFT IFSC.
  - **Prior to this, only foreign banks could issue such instruments.**
- **Call for Amendments:**
  - Experts argue that the **lack of tax exemptions** for non-bank entities creates uncertainty and disparity in the market. Experts highlighted the **need for similar tax clarity provided to IFSC banks to develop this product segment.**
- **Impact on Investments:**

- Also, emphasized that **extending tax relief to non-bank entities would encourage more investments, especially in debt instruments**. The absence of such exemptions discourages potential investors due to tax uncertainties.
- **Comparison with Treaty Benefits:**
  - Relying on treaty benefits for ODI structures done outside India involves stringent conditions. For example, **ODIs from the UK require reliance on the UK-India tax treaty for tax benefits on interest income and dividends**.
  - Using GIFT IFSC as a base provides an added layer of certainty, **as it avoids treaty-abuse provisions and capital gains tax on debt investments**.
- **Previous Legislative Changes:**
  - The Budget 2023 amended Section 18A of the Securities Contract Act, 1956, **validating ODI contracts issued by FPIs in GIFT IFSC and regulated by the IFSCA**.
- **Market Share:**
  - **P-Notes accounted for 2.14% of the total assets under custody of FPIs** as of March this year, indicating a significant portion of investment flows.

**Conclusion:** The absence of tax relief for non-bank P-Note holders in GIFT IFSC raises concerns about market fairness and investment attractiveness. **Experts suggest amending the tax laws to provide certainty and boost investment through this financial route.**

#### **Participatory Notes (P-Notes)**

- **P-Notes** are a form of Offshore Derivative Instruments (ODIs) issued by **registered Foreign Portfolio Investors (FPIs) to overseas investors**.
- These instruments **allow foreign investors to participate in the Indian stock markets without registering directly** with the Securities and Exchange Board of India (SEBI).
- **P-Notes typically have Indian stocks as their underlying assets**, providing exposure to the Indian equity market.
- **Role of FPIs:**
  - **Foreign Portfolio Investors (FPIs)** are non-residents who invest in Indian securities, including shares, government bonds, and corporate bonds. **They are registered entities with SEBI and play a crucial role in facilitating investments through P-Notes**.
- **Regulatory Framework:**
  - **While P-Note holders benefit from less stringent registration requirements compared to direct investors**, they are still subject to a proper due diligence process conducted by SEBI. This process ensures that **investments via P-Notes adhere to regulatory standards and guidelines**.

### **Indonesia plans import duties on clothing, ceramics, minister says**

#### **Sub: Economy**

#### **Sec: External Sector**

Context: Indonesia will impose **safeguard duties of 100% to 200%** on imports ranging from footwear to ceramics, reviving a plan to protect domestic industries, the trade minister said.

The planned import duties average more than 100%.

Trade Minister Zulkifli Hasan told reporters on Friday. "If we are flooded with (imported goods), our micro, small and medium enterprises could collapse."

**Southeast Asia's biggest economy** issued a regulation late last year to tighten monitoring for more than 3,000 imported goods, from food ingredients to electronics to chemicals.

However, the regulation was reversed after domestic industry said it hindered the flow of imported materials needed by domestic industry.

Duties will be imposed soon and could affect imports of footwear, clothing, textiles, cosmetics and ceramics, Mr. Zulkifli said.

Indonesia mainly imports apparel and clothing accessories from China, Vietnam and Bangladesh.

#### **Concept:**

- **Safeguard measures** include tariff increases to check increased imports of particular products that have caused 'serious injury' to domestic producers.
- **Safeguard Duty** is a tariff barrier imposed by the government on commodities to ensure that imports in excessive quantities do not harm the domestic industry.
  - It is mainly a temporary measure undertaken by the government in defence of the domestic industry which is harmed or has potential threat getting hard due to sudden cheap surge in imports.

- **Retaliatory custom duty**-a tax that a government charges on imports to punish another country for charging tax on its own exports to that country/removing the existing concession of duty.
- **Tariff-rate quota (TRQ)** (also called a tariff quota) is a two-tiered tariff system that combines import quotas and tariffs to regulate import products.
  - A TRQ allows a lower tariff rate on imports of a given product within a specified quantity and requires a higher tariff rate on imports exceeding that quantity.
  - **For example**, a country might allow the importation of 5,000 tractors at a tariff rate of 10%. However, any tractor imported above this quantity would be subject to a tariff rate of 30%.
  - Unlike a simple quota system, a TRQ regime **does not restrict the quantity of imported products**.
  - The “in-quota commitment” is complemented by an “out-of-quota commitment”.
  - **The out of quota** commitment does not set any limit on the quantity or value of an imported product, but instead applies a different, normally higher, tariff rate to that product. Imports face this higher duty rate once the in-quota quantity or value has been reached, or if any requirement associated with the “in-quota commitment” is not fulfilled
  - A TRQ is generally used to protect domestic production by restricting imports. Under that regime, the quota component combines with a specified tariff level to provide the desired level of protection. In many cases, imports above the threshold may face a prohibitive “out-of-quota” tariff rate.

#### Other types of Safeguard duty:

- **Countervailing duty (CVD)** is a specific form of duty that the government imposes in order to protect domestic producers by countering the negative impact of import subsidies. CVD is thus an import tax by the importing country on imported products.
  - To make their products cheaper and boost their demand in other countries, foreign governments sometimes provide subsidies to their producers. To avoid flooding of the market in the importing country with these goods, the government of the importing country imposes a countervailing duty, charging a specific amount on import of such goods.
- **Anti-dumping duties** are imposed when it is conclusively proved that a particular item is being exported at a price lower than what is prevailing in the domestic market of the exporter and is leading to disruption in the domestic market, injuring the local producers
  - An anti-dumping duty is a protectionist tariff that a domestic government imposes on foreign imports that it believes are priced below fair market value.
  - Dumping is a process where a company exports a product at a price lower than the price it normally charges in its own home market.
  - The duty is aimed at ensuring fair trading practices and creating a level-playing field for domestic producer’s vis-a-vis foreign producers and exporters.

### Red Flags Raised Over Silver Imports from UAE Through GIFT City

#### Sub: Economy

#### Sec: External Sector

In a significant disruption for the bullion market, **almost all of India's silver imports are now being handled by a few private players bringing the white metal from Dubai** through the GIFT City exchange. This could potentially **cause substantial revenue losses for the exchequer over time**.

- **Major Disruption in Bullion Market:**
  - Nearly all of India's silver imports are now managed by private players via GIFT City exchange.
  - This shift **could lead to significant revenue losses** for the government.
- **Call for Investigation:**
  - A trade research body has requested a probe into relationships between export and import firms to identify potential conflicts of interest.
  - There's concern that **this trend could extend to gold, platinum, and diamonds, disrupting traditional import practices and market dynamics**.
- **Surge in Imports from UAE:**
  - India's imports of gold and silver **from the UAE surged by 210% in 2023-24**, reaching \$10.7 billion.
  - Total silver imports stood at \$5.4 billion.
- **Dominance of Dubai in Silver Imports:**
  - In May, 87% of India's global silver imports came from Dubai at a reduced 8% duty, cleared through the GIFT City exchange.



- Since December 2023, GIFT City has been handling all silver imports from the UAE, leading to other ports being virtually abandoned.
- **Concerns Over Rules of Origin:**
  - Earlier attempts by banks to import silver from the UAE through other ports were questioned for not meeting **rules of origin of the India-UAE free trade deal.**
  - GTRI flagged the issue, highlighting that GIFT City imports might not meet the specified rules of origin requirements, unlike other ports.
- **Import Duty and Regulatory Loopholes:**
  - India imposes a 15% import duty on silver, with imports restricted to RBI/DGFT-nominated institutions.
  - **GIFT City, however, registers private traders and has not encountered rules of origin issues flagged elsewhere.**
- **Zero Tariff Agreement:**
  - Under the **India-UAE CEPA** signed in 2022, the duty on silver imports is set to reduce to 0% over 10 years, provided Dubai exporters meet the rules of origin.
  - **GTRI warns this could result in a revenue loss of ₹6,700 crore** as all silver imports are likely to come from the UAE due to tariff arbitrage.
- **Need for CEPA Renegotiation and Stricter Checks:**
  - GTRI suggests renegotiating **CEPA terms to nullify duty arbitrage and implementing rigorous checks on value addition claims by Dubai exporters.**

### India-UAE Comprehensive Economic Partnership Agreement (CEPA)

#### Overview:

- **Purpose:** The CEPA between India and the UAE aims to enhance trade and economic cooperation between the two countries.
- **Significance:** It is designed to reduce tariffs, promote investment, and create new opportunities for businesses in both nations.

#### Key Provisions:

- **Tariff Reductions:**
  - Gradual reduction of tariffs on various goods traded between India and the UAE.
  - Specific provisions for reducing import duties on precious metals like gold and silver, with tariffs set to reduce to 0% over a span of 10 years.
- **Rules of Origin:**
  - Criteria used to determine the national source of a product.
  - **Requirement:** Goods must meet specified criteria to qualify for reduced tariffs under the CEPA.
  - **Concerns:** Compliance with rules of origin has been questioned, especially for imports through the GIFT City exchange.
- **Trade Facilitation:**
  - Simplification of customs procedures to expedite the movement of goods.
  - Enhanced cooperation to combat customs fraud and improve compliance.
- **Market Access:**
  - Improved access for Indian goods and services in the UAE market, and vice versa.
  - Emphasis on sectors like textiles, gems and jewelry, pharmaceuticals, and engineering goods.
- **Investment Protection:**
  - Provisions to protect and promote bilateral investments.
  - Framework for resolving investment disputes.
- **Sector-Specific Agreements:**
  - Focus on sectors such as services, digital trade, intellectual property, and public procurement.

### Global Trade Research Initiative (GTRI)

- **Purpose:** GTRI is a think tank focused on analyzing and researching global trade policies and their impact on economies.
- **Activities:**
  - Conducts research on international trade agreements and their implications.
  - Provides policy recommendations to governments and stakeholders.

## Reducing Tariffs for Smartphone Components: Why the Industry Body is Calling for Tariff Cuts

### Sub: Economy

#### Sec: External economy

The Indian Cellular and Electronics Association (ICEA), an industry body representing mobile and other electronics assembly and manufacturing units, *has called for a reduction of tariffs on certain components for smartphones. This demand, on the surface, seems contradictory to the goal of expanding domestic production.*

#### Reasons for Tariff Cuts

- **Reducing Input Costs:**
  - **Obvious Reason:** Lowering the costs for smartphone assembly units.
  - **Domestic Market Saturation:** With domestic demand met, high component tariffs are less justified. Nearly every phone made in India is assembled domestically, with surplus units being exported.
- **Nature of Components:**
  - **Complex Components:** Components like Printed Circuit Boards (PCBs) and sub-assemblies are highly complex and not close to being manufactured domestically.
  - **High Costs for Local Assembly:** Current tariffs increase the cost for local assembly operations as these components still need to be imported.
  - **Future Domestic Manufacturing:** Domestic production of these components could take around eight years.
- **Economic Rationale:**
  - **Demand and Supply Mismatch:** The aggregate demand for certain inputs is much larger than the current production levels, leading to higher assembly costs.
  - **Domestic Pricing Strategy:** High tariffs cause domestic component makers to price just below the cost of imported components. Cutting tariffs would force them to lower prices, reducing operating expenses for assembly units.

#### Competitive Re-Alignment

- **Global Competitiveness:**
  - **Comparison with Other Countries:** Countries like China, Vietnam, Thailand, and Mexico enjoy lower tariffs due to special exemptions, making their products more competitive.
  - **Indian Companies:** For Indian companies like Micromax and Lava to compete globally, they need to use the best available technologies regardless of their origin.
- **Learning from China:**
  - **Chinese Example:** When China began assembling smartphones, their value addition was minimal. Today, Chinese firms contribute significantly more to manufacturing value by producing high-value components.
  - **Need for Scale:** Increasing smartphone production and exports is crucial. This requires reducing tariffs and maintaining tariff stability.

#### Government Support

- **Production Linked Incentive Scheme:**
  - **Subsidies:** The scheme subsidizes phones that are domestically assembled, supporting the industry's growth.

## Quality Control Orders (QCOs) on man-made fibres (MMF)

### Sub: Eco

#### Sec: External Sector

Industry players report that the market prices of PSF and VSF increased in FY24 following the implementation of QCOs on these inputs early on in the financial year.

Downstream synthetic textile manufacturers are urging the government to revoke Quality Control Orders (QCOs) on man-made fibres (MMF), which have undermined the competitiveness of the MMF supply chain by limiting access to affordable and specialised raw materials.

What is Quality Control Order?

- A QCOs are **regulatory measures introduced by the government** to establish quality standards for **specific products or product categories**. These orders are designed to ensure that **products meet certain prescribed quality, safety, and performance** requirements before they can be manufactured, imported, stored, or sold in the country.
- A QCO mandates foreign exporters to obtain Bureau of Indian Standards (BIS) certification to sell products covered under it in India. It is aimed towards curbing the import of poor quality products into the country.
- BIS is responsible for certifying products that **meet the prescribed standards, both for domestic and international manufacturers**.

- With the QCOs, manufacturing, storing and sale of non-BIS certified products are prohibited as per the BIS Act, 2016."
- Bureau of Indian Standards (BIS), the National Standards Body is a statutory body functioning under the Ministry of Consumer Affairs, Food and Public Distribution, Government of India.

#### About Viscose Fibre:

- Viscose is a **type of rayon**. Originally **known as artificial silk**, in the late 19th century, the term "rayon" came into effect in 1924.
- The name "viscose" is derived from the way this fibre is manufactured; a viscous organic liquid used to make both rayon and cellophane.
- It is a **biodegradable fibre and an alternative to silk and cotton**.
- It is **versatile, Highly absorbent and Inexpensive fibre**.
- Viscose is made **from tree wood pulp, like beech, pine, and eucalyptus, but can also be made from bamboo**.
- As a manufactured regenerated cellulose fibre, it is **neither truly natural** (like cotton, wool or silk) **nor truly synthetic** (like nylon or polyester) – it falls somewhere in between.
- Chemically, viscose resembles cotton, but it can also take on many different qualities depending on how it is manufactured.

### RBI Allows Foreign Currency Accounts in GIFT City

#### Sub: Economy

#### Sec: External Sector

The Reserve Bank of India (RBI) has **allowed Indian citizens to open foreign currency accounts (FCA) in the International Financial Service Centre (IFSC)** at Gujarat International Finance Tech-city (GIFT City) in Gujarat. This decision comes as a significant development for investors, **especially given the current restrictions on mutual funds (MFs) investing in overseas equities due to the \$8 billion cap**.

- **Relief for Investors:**
  - The RBI's move is a major relief as **mutual funds' investments in overseas equities have been frozen after reaching the \$8 billion cap**.
  - This includes a \$1 billion limit specifically for **overseas exchange-traded funds (ETFs)**.
- **Enhanced Investment Opportunities:**
  - The new regulation allows Indian residents to **open FCAs in GIFT City, enabling them to manage up to \$250,000 annually for international transactions** without prior RBI approval.
  - This facilitates broader global investment opportunities, **allowing individuals to diversify their portfolios with stocks, bonds, and other foreign assets**.
- **Global Financial Participation:**
  - By opening FCAs in GIFT City, individuals can keep their funds within the Indian financial system while participating in global financial activities.
  - This is particularly beneficial for **high net worth individuals who typically open accounts in international financial hubs like Dubai and Singapore**.
- **Progressive Financial Reforms:**
  - This measure is seen as a progressive step towards **achieving full convertibility of the Indian rupee and establishing it as a global currency**.
  - It aligns GIFT City with other international financial centres, enhancing its global competitiveness.

#### Conclusion

The RBI's decision to allow foreign currency accounts in GIFT City is a significant step towards liberalizing India's financial sector. **It opens up new avenues for Indian investors, promoting financial inclusion and facilitating broader global investment opportunities**. This move not only provides relief amidst the restrictions on mutual funds' overseas investments but **also positions GIFT City as a competitive international financial hub**.

#### Current Account Convertibility

India achieved full current account convertibility in August 1994. This means that ***all transactions related to trade in goods and services, interest payments, and remittances can be freely conducted without restrictions***.

- **Trade in Goods and Services:**
  - Importers and exporters can convert their earnings and payments between the Indian rupee and foreign currencies without restriction.
  - This facilitates international trade and investment.
- **Interest Payments and Remittances:**

- Individuals and businesses can freely remit interest payments and receive remittances from abroad.
- Non-resident Indians (NRIs) can send money back to India without any limits.

### Capital Account Convertibility

India has partial capital account convertibility. This means that there are **certain restrictions on the conversion of the rupee into foreign currencies for capital transactions.**

- **Foreign Direct Investment (FDI):**
  - FDI is largely liberalized, and foreign investors can invest in most sectors without prior government approval.
  - There are **some sectors with caps on foreign ownership** and areas where government approval is required.
- **Foreign Portfolio Investment (FPI):**
  - Foreign institutional investors (FIIs) and foreign portfolio investors (FPIs) can invest in Indian securities such as stocks and bonds.
  - There are certain limits on the amount of investment in specific sectors and types of securities.
- **External Commercial Borrowings (ECBs):**
  - Indian companies can raise **debt from foreign lenders, but there are regulations governing the amount, maturity, and cost of these borrowings.**
- **Outbound Investments:**
  - Indian companies can invest abroad, **but these investments are subject to limits and regulatory approvals.**
  - Individuals can also invest abroad under the Liberalized Remittance Scheme (LRS), which allows them to **remit up to USD 250,000 per financial year for various purposes, including investments.**

### India Urges Russia to Address Non-Tariff Barriers to Boost Trade

#### Sub: Economy

#### Sec: External Sector

- **India's Request:**
  - India is urging Russia to **address non-tariff barriers (NTBs)** in sectors such as marine products and pharmaceuticals.
  - The aim is to boost Indian exports and reduce the trade imbalance between the two countries.
- **Bilateral Trade Target:**
  - **Target:** Achieve bilateral annual trade of \$100 billion by 2030.
  - **Current Trade:** About \$65 billion in 2023-24.
- **Leadership Commitment:**
  - The trade target was set by **PM Narendra Modi** and **Russian President Vladimir Putin** at a recent summit in Moscow.
  - Both leaders agreed to work on increasing Indian exports to reduce the trade deficit.
- **Commerce Secretary** highlighted the focus on different sectors and the need for Russia to look into NTBs and mentioned plans for another trade delegation visit to Russia to discuss better market access.

#### Focus Areas for Increased Market Access

- **Engineering Products**
- **Electronics**

#### Impact of Economic Sanctions on Russia

- Following Western sanctions on Russia after its attack on Ukraine in February 2022, India's imports of discounted crude oil from Moscow have increased significantly.
  - **Imports from Russia (2023-24):** \$61 billion.
  - **India's Exports to Russia (2023-24):** Approximately \$4 billion.

#### Conclusion

India is pushing for Russia to address non-tariff barriers to help boost its exports and achieve the ambitious **bilateral trade target of \$100 billion by 2030.** Increased market access for Indian products, particularly in sectors like engineering and electronics, is crucial for reducing the trade deficit and enhancing economic cooperation between the two nations.

#### Non-Tariff Barriers (NTBs)

**Non-Tariff Barriers (NTBs)** are restrictions that countries use to control the amount of trade across their borders, which are not in the form of a tariff. These barriers can be in the form of regulations, standards, testing, certification, and other requirements that products must meet before they are allowed to enter a country or be sold.

#### Types of Non-Tariff Barriers

- **Import Quotas:**
  - Limits on the quantity of goods that can be imported.
  - Example: A country may limit the import of a specific agricultural product to protect domestic farmers.
- **Subsidies:**
  - Financial support from the government to local businesses.
  - Example: Subsidies for local farmers reduce their costs, making them more competitive than imported products.
- **Standards and Regulations:**
  - Requirements related to product quality, safety, and health standards.
  - Example: Stringent health standards for food products that foreign suppliers must meet.
- **Customs Procedures:**
  - Complex and lengthy customs procedures can act as barriers.
  - Example: Extensive documentation and slow processing times for imports.
- **Licenses:**
  - Requirements for importers to obtain licenses before importing goods.
  - Example: Import licensing for pharmaceuticals to ensure quality control.
- **Voluntary Export Restraints (VERs):**
  - Self-imposed export limits by exporting countries.
  - Example: A country voluntarily limiting its export of steel to another country.
- **Embargoes:**
  - Official bans on trade with specific countries or products.
  - Example: Trade embargoes imposed on countries due to political reasons.
- **Sanitary and Phytosanitary Measures:**
  - Measures to protect humans, animals, and plants from diseases, pests, or contaminants.
  - Example: Restrictions on imports of livestock due to disease outbreaks.
- **Anti-Dumping Measures:**
  - Actions taken to protect domestic industries from foreign companies dumping products at below-market prices.
  - Example: Imposing duties on imported steel sold at unfairly low prices.
- **Technical Barriers to Trade (TBT):**
  - Regulations, standards, testing, and certification procedures.
  - Example: Specific packaging requirements for imported goods.

#### Impact on Trade

- **Increased Costs:**
  - Compliance with NTBs can increase the cost of goods for exporters.
- **Reduced Competitiveness:**
  - NTBs can make foreign products less competitive compared to domestic products.
- **Market Access:**
  - NTBs can restrict or limit market access for foreign suppliers.

### 346 More Defence Items Worth ₹1,048 Crore Removed from Import List

**Sub: Eco**

**Sec: External Sector**

#### Overview:

- The Ministry of Defence (MoD) has notified the 5th '**Positive Indigenisation List (PIL)**' consisting of 346 items.
- The aim is to reduce dependence on imports by allowing defence PSUs to place orders worth ₹1,048 crore with domestic vendors.

#### Purpose:

- The initiative is led by the Department of Defence Production (DPP) under the MoD to **boost self-reliance (aatmanirbharta)** in the defence sector.

#### Defence PSUs Involved:

- Hindustan Aeronautics Ltd (HAL)

- Bharat Electronics Ltd (BEL)
- Bharat Dynamics Ltd (BDL)
- BEML Ltd
- India Optel Ltd (IOL)
- Mazagon Dock Shipbuilders Ltd (MDL)
- Goa Shipyard Ltd (GSL)
- Garden Reach Shipbuilders & Engineers Ltd (GRSE)
- Hindustan Shipyard Ltd (HSL)

#### Implementation:

- These DPSUs have started the process of issuing **expressions of interest/requests for proposals** on their websites, linked to the 'Srijan Portal'.
- Industry, MSMEs, and start-ups are encouraged to participate.

#### Indigenisation Achievements:

- **Over 12,300 items** have been indigenised in the last three years.
- This has resulted in DPSUs placing orders worth **₹7,572 crore** with domestic vendors.

#### Total Indigenisation Efforts:

- By June 2024, **over 36,000 defence items** were offered to the industry for indigenisation.
- More than **12,300 items** have been indigenised in the last three years.

#### Positive Indigenisation List (PIL)

**Concept:** The Positive Indigenisation List entails that the Indian Armed Forces (Army, Navy, Air Force) will source specific items exclusively from domestic manufacturers. These manufacturers include private sector entities and Defense Public Sector Undertakings (DPSUs).

#### Objectives:

- Align with India's vision of 'Atma Nirbharta' (self-reliance)
- Boost the domestic defense industry
- Enhance investment
- Reduce dependency on imports

#### Procurement and Industry Participation:

- **DPSUs' Role:** Initiate procurement actions for the items listed in the fourth PIL.
- **Srijan Portal Dashboard:** Designed to facilitate the procurement process, encouraging industry participation.

#### Global Bond Index Inclusion to Enhance 'Indianisation' of Hot Money

##### Sub: Eco

##### Sec: External Sector

#### Introduction:

- **India's inclusion in global bond indices** is expected to bolster the balance of payments (BoP) surplus and promote the 'Indianisation' of global hot money, according to SBI's economic research team.

#### Key Developments:

- In September, **JP Morgan Chase announced** that Indian Government Bonds (IGBs) would be included in its **Emerging Market Index Global Diversified (GBI-EM GD) index** starting June 28, 2024.
- Monthly net inflows into **FAR (Fully Accessible Route) securities** have reached **₹90,000 crore** from October 2023 to June 2024.

#### Expected Outcomes:

- Post-inclusion, India's weight in the index is expected to reach **10% in the GBI-EM Global Diversified index** and approximately **8.7% in the GBI-EM Global index**, potentially attracting **passive flows of \$20-22 billion** by March 2025.
- The decision to include India in the JPM GBI-EM index first is seen as a deliberate strategy by the **Government/RBI to ensure smooth future developments**.

#### Inflows from ETFs:

- Once the **Bloomberg Barclays EM bond index** incorporates Indian bonds starting January 2025, fund flows are expected to increase further.
- **Global marquee ETFs** (iShares, Vanguard, SPDR) modelled along these indices are anticipated to crowd in inflows.



- Several global marquee funds, currently using proxies like **total returns swaps and supranational bonds**, have shown interest in directly entering the Indian market.

#### Competitive Edge:

- This inclusion indicates the **incremental Indianisation of global flows**, positioning India to compete with China in the **Asia Ex-Japan (AXJ) category**.
- With bond issuances in China totalling **71 trillion yuan** (about \$10 trillion) in 2023, India aims to become the **second-largest bond market among emerging markets**, overtaking Brazil.

#### Impact on Liquidity:

- Significant foreign investment will enhance the depth of the government bond market and support system liquidity.
- The **liquidity situation, affected by the just-in-time mechanism** and government surplus cash balances, might see some improvement.
- However, **primary liquidity from index inclusion flows is expected to be managed** by the RBI to maintain stability.

#### Conclusion:

- **India's ascent to the second-largest bond market** among emerging markets could directly compete with China for fund allocations.
- **RBI's management of debt and forex markets** will be crucial in smoothing out any frictions and maintaining a strong foreign currency debt to GDP ratio, enhancing India's case for a rating upgrade by major agencies.

#### Fully Accessible Route (FAR)

- **Launch Date:** April 1, 2020
- **Purpose:** Allows non-residents to invest in specified government bonds without restrictions.
- **Initiative:** Opens certain categories of government bonds fully for non-resident investors.
- **Policy:** Under FAR, eligible investors can invest in specified government securities without any investment ceilings.
- **Framework:** FAR operates alongside existing routes such as the Medium Term Framework (MTF) and the Voluntary Retention Route (VRR).

#### Benefits:

1. **Access:** Substantially eases access for non-residents to Indian government securities markets.
2. **Global Inclusion:** Facilitates inclusion in global bond indices.
3. **Foreign Investment:** Attracts stable foreign investment in government bonds.

#### Voluntary Retention Route (VRR):

**Purpose:** Encourages Foreign Portfolio Investors (FPIs) for long-term investments in Indian debt markets.

#### Features:

- **Operational Flexibility:** Provides operational flexibility and exemptions from certain regulatory requirements.
- **Retention Period:** Requires a minimum retention period of three years, with FPIs maintaining a minimum of 75% of the allocated amount in India.
- **Investment Limits:** Available on tap and allotted by the Clearing Corporation of India Ltd. (CCIL) on a 'first come first served' basis.

### WTO Pact Concerns for Small Fisher Bodies

#### Sub: Eco

#### Sec: External sector

- **Background:**
  - Small-scale fisher organizations from India, Bangladesh, Ecuador, Gambia, and Indonesia have raised concerns about the **WTO's comprehensive agreement on curbing overcapacity and overfishing (OCOF) subsidies**.
  - They believe this agreement will have serious implications for their future and that of indigenous communities worldwide.
- **Demand:**
  - These organizations demand that **subsidy negotiations be kept out of the WTO**.
  - They propose that such negotiations be handled by the Committee of Fisheries under the Food and Agriculture Organisation's (FAO) Sub-Committee on Trade, which they argue has the requisite expertise.
- **Special and Differential Treatment:**
  - A major concern is the limited **special and differential treatment** provisions in the draft agreement, which offer exemptions for small-scale fishing in developing countries.

- They fear the **definition and application of these exemptions may not adequately protect small-scale fishers.**
- **Challenges:**
  - There are concerns about **how "small-scale fishers" are defined, ensuring that exempted activities do not become industrialized.**
- **Organizations Involved:**
  - The World Forum of Fisher Peoples and the World Forum of Fish Harvesters and Fish Workers represent **national organizations of traditional small-scale fishing communities, including those in India.**
- **Current Status:**
  - The issue was highlighted at the recent Small-Scale Fisheries (SSF) Summit and Committee on Fisheries meeting in Rome.
  - The fisher organizations are actively seeking to **shift negotiations to an entity with more relevant expertise, such as the FAO's Sub-Committee on Trade.**

#### **Implications:**

- **Economic Impact:** The potential impact on the livelihoods of small-scale fishers if the WTO agreement goes through as currently drafted.
- **Policy Influence:** The role of specialized bodies like the FAO's Sub-Committee on Trade in handling fisheries-related negotiations.
- **Global Fisheries Management:** The broader implications for global fisheries management practices and sustainability.

#### **Agreement on Fisheries Subsidies (AFS) - Key Points**

The Agreement on Fisheries Subsidies (AFS) addressing significant issues related to overcapacity, overfishing, and illegal fishing practices.

#### **Agreement Details**

- **Provisions:**
  - Prohibits subsidies for Illegal, Unreported, and Unregulated (IUU) fishing and overfished stocks.
  - Bans subsidies for fishing on high seas outside the jurisdiction of coastal countries and Regional Fisheries Management Organizations.
- **Special and Differential Treatment (S&DT):**
  - Developing Countries and Least Developed Countries (LDCs) get a two-year transition period to comply with the agreement.
- **Exemptions:**
  - No prohibition on subsidies if the vessel or operator is not engaged in IUU fishing.
  - Subsidies for overfished stocks allowed if aimed at rebuilding stocks to sustainable levels.

#### **Benefits of the Agreement**

- **Eliminates Harmful Subsidies:**
  - Targets subsidies to vessels/operators involved in IUU fishing.
- **Supports Coastal Countries:**
  - Reduces large-scale IUU fishing, protecting fisheries resources and livelihoods.

#### **India's Stand on AFS**

- **Minimal Fisheries Subsidies:**
  - Despite its large population, India provides minimal subsidies compared to advanced fishing nations.
- **Sustainable Practices:**
  - India's fisheries sector relies on small-scale and traditional fishers, practicing sustainable resource utilization.
- **Principles for Obligations:**
  - Advocates for higher obligations on nations historically providing large subsidies and engaging in industrial fishing, adhering to 'polluter pay principle' and 'common but differentiated responsibilities'.

#### **China's Gold Buying Trends**

**Sub: Eco**

**Sec: External sector**

#### **Introduction**

- China has the largest foreign currency reserves globally, at \$3.22 trillion as of June 2023.



- Despite this, **gold's share in China's reserves is at a record high of 4.9%, still below the global average of 16%.**

#### **Reasons for Gold Buying**

- **Safety:** Gold reserves are safe from seizure as they can be stored onshore.
- **Diversification:** Amidst geopolitical tensions and sanctions (e.g., Russia-Ukraine conflict), China aims to diversify away from U.S. dollar-denominated assets.

#### **Historical Context**

- The People's Bank of China (PBOC) resumed gold purchases in November 2022 after a three-year pause.
- This resumed buying helped drive global gold prices to record highs in 2024.

#### **Current Trends**

- China paused its gold purchases in May and June 2024, attributed to high gold prices.
- Despite the pause, China's gold buying is expected to continue due to its low gold reserve share relative to its economic size and ongoing geopolitical risks.

#### **Comparisons and Motivations**

- Russia, with 30% of its reserves in gold, serves as a cautionary example for China. Western sanctions froze about half of Russia's reserves, highlighting the security of holding gold.
- Analysts believe China's motivation includes reducing dependence on the U.S. dollar and mitigating risks of potential U.S. sanctions.

#### **Future Prospects**

- If China increases its gold reserves to match the global average, significant additional purchases would be required.
- Continued **geopolitical tensions between China and the U.S.** are likely to sustain China's gold buying strategy.

#### **Impact on Markets**

- PBOC's gold buying has a notable influence on global gold prices.
- Increased demand from both official and retail sectors in China supports gold as a secure investment.

#### **Strategic Considerations**

- As China looks to bolster its economic security through increased gold reserves, it faces the challenge of balancing purchase volumes with market prices.
- The strategic shift towards gold aligns with China's broader goal of economic resilience and reduced exposure to U.S.-dominated financial systems.

### **No Plans to Review Curbs on Chinese FDI by Commerce and Industry Minister**

#### **Sub: Eco**

#### **Sec: External sector**

#### **Statement on Chinese FDI Curbs:**

- **Ministry of Commerce and Industry** clarified that there are **no plans to review the restrictions on Chinese investments in India** via Foreign Direct Investment (FDI).
- The **Economic Survey's recommendations** to reconsider these curbs are **not binding on the government.**
- **Economic Survey Context:**
- The **Chief Economic Adviser's report** offers **new ideas and perspectives**, but it **does not dictate government policy.**
- Goyal emphasized that there is **no rethinking on supporting Chinese investments** in the country at this point.

#### **European Union's Carbon Border Adjustment Mechanism (CBAM):**

- The EU has suggested that India could consider **levying a domestic tax** instead of paying the **CBAM levy** directly to the EU.
- Ministry indicated that the **Indian government is in dialogue with the EU on this matter.**

#### **Concerns About CBAM:**

- Goyal expressed that **CBAM might negatively impact the EU's economy**, increasing costs for infrastructure, living, and consumer products.
- Despite these concerns, the **EU is keen on implementing CBAM.**

#### **Decision on Domestic Mechanism:**

- A decision on whether India will adopt a **domestic tax mechanism** in place of the CBAM levy will be based on **what benefits the Indian industry and the people of India.**
- The government will prioritize the **interests of India's economy and its citizens** in making this decision.

#### **About Carbon Border Adjustment Mechanism (CBAM)**

The European Union (EU) has announced the introduction of its **Carbon Border Adjustment Mechanism (CBAM)** in its transitional phase from October 2023. This mechanism will impose a **carbon tax on imports of products** made from processes that are not environmentally sustainable or non-Green. The CBAM will translate into a **20-35% tax on select imports into the EU starting 1st January 2026**.

CBAM is part of the “**Fit for 55 in 2030 package**”, which aims to reduce greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels, in line with the **European Climate Law**. The CBAM ensures that imported goods are subject to the same carbon costs as products produced within the EU, thereby **promoting fair competition** and **reducing carbon emissions globally**.

#### **Implementation:**

- Importers must declare the quantity of goods imported into the EU and their embedded **Greenhouse Gas (GHG) emissions** annually.
- To offset these emissions, importers will need to surrender a corresponding number of **CBAM certificates**, priced based on the **EU Emission Trading System (ETS)** allowances.

#### **Objectives:**

- The CBAM aims to prevent carbon leakage, encourage global adoption of stricter environmental regulations, and support cleaner production practices worldwide.

#### **Significance:**

- **CBAM can incentivize non-EU countries** to adopt more stringent environmental standards, thereby reducing global carbon emissions.
- It helps prevent carbon leakage by discouraging companies **from relocating to countries with weaker environmental regulations**.
- The revenue from CBAM will support EU climate policies, **offering a model that other countries could adopt to promote Green Energy**.

#### **Impact on India's Exports:**

- CBAM is likely to affect India's exports of metals such as **iron, steel, and aluminum products** to the EU, which will face additional scrutiny and potentially higher costs under the mechanism.
- From 1st January 2026, the **EU will start collecting the carbon tax** on each consignment of steel, aluminum, cement, fertilizer, hydrogen, and electricity.

Indian products have a higher carbon intensity due to the dominant use of coal, with approximately **75% of India's energy coming from coal**. This is much higher than the EU's 15%

### **Shift of Household Savings from Banks to Mutual Funds and Capital Markets including in futures and options (F&O)**

#### **Sub: Eco**

#### **Sec: Financial market**

- **Change in Consumer Behaviour:**
  - **Traditional Preference:** Historically, households preferred banks for their savings.
  - **Current Trend:** Increasing shift towards capital markets and other financial intermediaries.
- **Impact on Bank Deposits:**
  - **Decline in Share:** Bank deposits, while still dominant, are declining in percentage of household financial assets.
  - **Diversification:** Savings are being increasingly allocated to Mutual Funds, Insurance Funds, and Pension Funds.
- **Implications for Banking Sector:**
  - **Credit-Deposit Gap:** Banks are turning to short-term borrowings and certificates of deposit to bridge the gap.
  - **Liquidity Management Challenges:** Increased sensitivity to interest rate movements.
- **Need for Vigilance and Adaptation:**
  - **CASA Deposits:** Shift away from Current Account Savings Account deposits.
  - **Risk Management:** Emphasis on improving credit underwriting standards and pricing of risks.
- **Learning from Global Banking Crises:**
  - **US and Switzerland (2023):** Highlighted risks and vulnerabilities in certain business models.
  - **Resilience Building:** Importance of learning from these crises to enhance banking sector resilience.
- **Growth of F&O Trading:**
  - **Unexpected Increase:** Significant rise in F&O trading volumes and losses, especially among young investors.

- **Macro-Level Concerns:**
  - **Economic Disruption:** Household savings diverted to speculative activities rather than capital formation.
  - **Systemic Risk:** The potential for a black-swan event and its implications on the capital market ecosystem.
- **Data-Driven Regulation:**
  - **Flexible Approach:** SEBI will adapt its views based on data and changing facts.
- **Statistics on F&O Trading:**
- **Turnover Growth:**
  - Index options turnover **increased from ₹4.5 lakh crore (2018) to ₹140 lakh crore (2024).**
  - Overall turnover in derivative segment **increased from ₹210 lakh crore (2018) to ₹500 lakh crore (2024).**
  - **Individual Investor Participation:** Increased from 2% to 41% in the same period.

### Derivatives and Their Types

**Derivatives** are financial instruments whose value is derived from an underlying asset. **The price of a derivative changes in relation to changes in the value of the underlying asset. Derivatives are used primarily for hedging risks but can also be used for speculative purposes.**

#### 1. Futures

- Exchange-traded contracts to buy or sell a specific amount of a commodity or financial instrument at a predetermined price at a specified time in the future.
- **Standardization:** Futures contracts are standardized in terms of quality, quantity, and delivery time.
- **Trading:** Highly liquid due to their standardization and presence on exchanges.
- **Use Case:** Manufacturers can use futures to secure raw materials at set prices, mitigating the risk of price fluctuations.

#### 2. Forwards

- Customized contracts traded over-the-counter (OTC) between two parties to buy or sell an asset at a specified future date for a price agreed upon today.
- **Flexibility:** Terms such as delivery date, price, and contract size are negotiable between the parties.
- **Execution:** Generally held to maturity for actual delivery of the underlying asset.
- **Use Case:** Typically used for hedging against price movements in commodities.

#### 3. Swaps

- Contracts in which two parties exchange cash flows or other financial instruments over a period of time.
- **Types:** Common types include interest rate swaps and commodity swaps.
  - **Interest Rate Swap Example:** One party pays a fixed rate while the other pays a floating rate.
  - **Commodity Swap Example:** An airline company pays a fixed price for kerosene while a bank pays the spot price.
- **Use Case:** Swaps are used to manage exposure to fluctuations in interest rates or commodity prices.

#### 4. Options

- Contracts that provide the holder the right, **but not the obligation, to buy (call) or sell (put) an underlying asset at a predetermined price (strike price) within a specified time frame.**
- **Types of Settlements:**
  - **Physical Delivery:** The underlying asset is delivered upon exercising the option.
  - **Cash Settlement:** The difference between the spot price and the strike price is paid in cash.
- **Positions:**
  - **In the Money (ITM):** Strike price is more favorable than the spot price.
  - **At the Money (ATM):** Strike price is equal to the spot price.
  - **Out of the Money (OTM):** Strike price is less favorable than the spot price.
- **Use Case:** Options are widely used for hedging purposes, offering the potential for profit with limited risk.

### Proposal forward by French economist Gabriel Zucman of Minimum Annual Tax

**Sub: Economy**

**Sec: Fiscal Policy**

The proposal put forward by French economist Gabriel Zucman revolves around imposing a minimum annual tax of 2% on individuals with wealth exceeding \$1 billion.

## Proposal Overview

- **Annual 2% Tax on Billionaires:**
  - Gabriel Zucman recommends a global minimum tax standard where individuals holding wealth above \$1 billion would be required to pay annually 2% of their total wealth.
  - This tax is aimed at **ensuring effective taxation of ultra-high-net-worth individuals (UHNWIs) globally.**
- **Revenue Potential:**
  - It is estimated that such a tax could generate \$200-\$250 billion annually globally from approximately 3,000 individuals.
  - **If extended to cover individuals with a net worth exceeding \$100 million, it could add \$100-\$140 billion annually in global tax revenue.**
- **Rationale:**
  - Ultra-high-net-worth individuals currently benefit from very low effective tax rates, ranging between 0% and 0.5% of their wealth.
  - The proposal aims to address wealth concentration and ensure fair contributions towards public goods and services.
  - Progressive taxation is seen as crucial for social cohesion, trust in governance, and funding essential investments such as climate action.

## Relevance to India

- **Wealth Inequality:** India has seen **significant wealth concentration at the top**, with the top 1% holding substantial shares of income and wealth.
- **Potential Revenue:** A proposed '**super tax**' on the wealthiest families in India could yield significant revenue, enhancing fiscal capacity for essential social expenditures.

## Union Government's Financial Transfers to States

### Sub: Eco

### Sec: Fiscal Policy

#### Context:

- Tamil Nadu CM alleged the Union government is withholding funds for vital state projects.
- Concerns arise over tax policies **reducing financial transfers to states, potentially weakening cooperative federalism.**

#### Historical Financial Transfers:

- **Fourteenth Finance Commission (2015-16):**
  - Recommended devolving 42% of Union tax revenues to states.
- **Fifteenth Finance Commission:**
  - Retained 41% (excluding Jammu & Kashmir and Ladakh).

#### Decline in States' Share:

- **Gross vs. Net Tax Revenue:**
  - Net tax revenue is calculated after deducting collections under cess, surcharge, Union Territories' revenue, and tax administration expenditure.
- **Revenue from Cess and Surcharge:**
  - Increased from 5.9% in 2015-16 to 10.8% in 2023-24.
  - These collections are not shared with states and are used for specific Union government schemes.
- **Grants-in-Aid to States:**
  - Declined from ₹1.95 lakh crore in 2015-16 to ₹1.65 lakh crore in 2023-24.
- **Combined Share:**
  - Statutory financial transfers declined from 48.2% to 35.32% of the gross tax revenue of the Union government.

#### Centralisation of Public Expenditure:

- **Centrally Sponsored Schemes (CSS):**
  - Increased from ₹2.04 lakh crore in 2015-16 to ₹4.76 lakh crore in 2023-24.
  - States must commit matching finances to avail grants, affecting inter-state equity.
- **Central Sector Schemes (CSec):**
  - Fully funded by the Union government, allocation increased from ₹5.21 lakh crore in 2015-16 to ₹14.68 lakh crore in 2023-24.

- Only ₹60,942 crore devolved to states in 2023-24.

### Impact on Cooperative Federalism:

- **Non-Statutory Transfers:**
  - CSS and CSec schemes are non-statutory, forming 12.6% of gross tax revenue.
  - Total financial transfers as a proportion of gross tax revenue were 47.9% in 2023-24.
  - Tied grants reduce states' expenditure freedom.
- **Fiscal Power of Union Government:**
  - Retains more than 50% of gross tax revenue.
  - Incurs a fiscal deficit of 5.9% of GDP.

### Centrally Sponsored Schemes (CSS)

Centrally Sponsored Schemes are schemes funded by the Union government but implemented by state governments.

#### Key Features:

1. **Funding Pattern:** The funding is shared between the Union and state governments, with the Union government typically providing a significant portion of the funding while the states contribute the remainder.
2. **Implementation:** These schemes are implemented by state governments, which means that while the central government designs and funds these schemes, the responsibility for their execution lies with the states.
3. **Objective:** CSS aims to ensure that national priorities are addressed through state-level implementation, often focusing on sectors like health, education, agriculture, and rural development.
4. **Types of CSS:** CSS can be broadly categorized into core schemes (national priorities like health and education), core of the core schemes (most crucial schemes like MNREGA), and optional schemes (schemes of lesser priority).

#### Examples:

- Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)
- Pradhan Mantri Awas Yojana (PMAY)
- Swachh Bharat Mission (SBM)
- National Health Mission (NHM)

### Central Sector Schemes

Central Sector Schemes are schemes entirely funded and implemented by the Union government.

#### Key Features:

1. **Funding Pattern:** These schemes are fully funded by the Union government, with no financial contribution required from the states.
2. **Implementation:** The implementation of these schemes is directly managed by central government agencies or departments.
3. **Objective:** CSec Schemes are designed to address issues that fall within the exclusive jurisdiction of the central government or to achieve objectives that are national in scope.
4. **Focus Areas:** These schemes often focus on areas such as defense, space technology, infrastructure development, and other strategic sectors.

#### Examples:

- Pradhan Mantri Kaushal Vikas Yojana (PMKVY)
- National Highways Development Project (NHDP)
- Digital India
- Make in India

### 45-Day MSME Payment Rule

**Sub: Eco**

**Sec: Fiscal Policy**

#### Context:

- The SME Chamber of India has urged Finance Minister to continue the **45-day payment rule for MSMEs**.
- Section 43B(h) of the Income Tax Act was **introduced in the Finance Act 2023 to address delayed payments to MSMEs**.

#### Key Points:

- **45-Day Payment Rule:**
  - Larger companies must pay MSMEs within 45 days if there is a written agreement.

- **Failure to pay on time disqualifies the expense from being deducted from taxable income.**
- **Objective:**
  - The rule aims to alleviate the issue of delayed payments, which is a significant challenge for MSMEs.
- **Industry Body's Request:**
  - The SME Chamber of India emphasized not changing this rule despite pressure from larger corporates and multinational companies.
  - **Timely payments are crucial for the survival and growth of the MSME sector.**

#### Section 43B(h) of the Income Tax Act:

- **Mandate:**
  - Reinforces timely payments by making it a condition for expense deduction.
- **Implications:**
  - Ensures that companies are incentivized to pay MSMEs on time to avoid higher tax liabilities.
- **Support for MSMEs:**
  - Helps MSMEs maintain cash flow and avoid financial stress caused by delayed payments.
- **Economic Impact:**
  - MSMEs contribute significantly to the economy, and timely payments help sustain their operations and growth.

#### The 45-Day MSME Payment Rule

To ensure timely payments to the Micro, Small, and Medium Enterprises (MSME) sector, **a new regulation was implemented on April 1, 2024. This regulation mandates companies to settle their dues with MSMEs within 45 days.**

#### Section 43B(h):

- **Introduction:** The Finance Act 2023 amended the Income Tax Act by adding clause (h) to Section 43B.
- **Stipulation:** Any payments owed to MSMEs not resolved within 45 days will not qualify for tax deductions until the payment is made.
- **Objective:** This clause aims to motivate larger entities to prioritize their settlements with MSME counterparts, thereby promoting a more robust economic environment for these smaller businesses.
- **Applicability:** Section 43B(h) applies to transactions involving the purchase of goods or services from enterprises registered under the MSMED Act, 2006.

#### Failure to Comply:

- **Penalties:** Failure to adhere to the 45-day timeframe results in penalties, including compounded interest penalties at three times the bank rate set by the Reserve Bank of India (RBI).
- **Tax Implications:** Businesses risk losing the ability to deduct payments made to MSEs from their taxable income.

#### Corporate tax cut

##### Sub: Eco

##### Sec: Fiscal Policy

##### Context:

Opposition party alleged that the corporate tax cut has put over Rs 2 lakh crore in the pockets of billionaires, while the middle class continues to bear the weight of heavy taxation in light of CBDT data.

Data released by Central Board of Direct Taxes (CBDT)

As of July, 2024:

India's net direct tax collection recorded a significant growth of 19.54 % in FY25 to 5.7 Lakh crore.

Net direct tax collection	Rs 5,74,357 crore
Corporation Income Tax	Rs 2,10,274 crore
Personal Income Tax	Rs 3,46,036 crore

Recent Data shows that **Individuals are paying more tax than companies**

#### Corporate tax cut

- **Corporate tax rates were slashed in September 2019 from 30% to 22%** in the hope that it would trigger a private investment boom.
- However, **private investment is said to have collapsed from 35% of GDP in 2014 to below 29% in 2024.**

#### Corporate Tax (Corporation tax)

- Direct tax paid by public and private companies registered under Companies Act 1956, on net income or profit.



- Levied on both domestic and international companies.

## Finance Ministry eases procurement rules for scientific research equipment

**Subject: Economy**

**Sec: Fiscal policy**

**Context:**

- Ahead of the presentation of the **Union Budget**, the **Finance Ministry** has announced changes that will provide **greater flexibility to scientific Ministries to import and buy equipment necessary for research.**

**More about News:**

- In the **General Finance Rules (GFR)**, follow **demands** made for years by scientists, who have often said that **restrictive rules on the purchase of research equipment had slackened the pace of research productivity.**
- The **GFR**, which are prescribed by the **Finance Ministry**, define the conditions under which **public procurement is conducted**, and they are **periodically updated.**
- **New exemptions** are specific to the “**scientific Ministries**”
  - **Department of Science and Technology**
  - **Department of Biotechnology**
  - **Department of Scientific and Industrial Research**
  - **Department of Atomic Energy**
  - **Department of Space**
  - **Ministry of Earth Sciences**
  - **Defence Research and Development Organisation**
  - **Indian Council of Agricultural Research**
  - **Department of Health Research including Indian Council of Medical Research, and institutions conducting post-graduate research affiliated to Ministries.**

**Changes in Threshold Price of goods:**

- The first of the **changes are in raising the threshold price of goods** that may be bought without going through a tendering process. The relaxations came into effect, the threshold was **₹25,000**. It has now been **raised to ₹1,00,000.**
- The **second** is that for **goods priced between ₹25,000 to ₹250,000**, a **purchase committee** consisting of **three members** nominated by the **Head of Department** must survey the market to establish that it offers the most value for **money and quality**. That limit has now been **raised from ₹100,000 to ₹10,00,000.**

However, and this is the catch most scientists are **not quite happy** with, these relaxations are only **applicable once it is established that the required goods are unavailable** on the **Government e-Marketplace (GeM).**

The **GeM** is a **government mandated website**, such as the **Amazon online marketplace**, which lists **sellers of India-made or assembled goods**, and is administered by the **Ministry of Micro, Small and Medium Enterprises**

**General Finance Rules (GFR):**

- **Government has amended the General Financial Rules, 2017.**
- General Financial Rules (GFRs) are a **compilation of rules and orders of Government of India to be followed by all while dealing with matters involving public finances.**
- These rules and orders are treated as **executive instructions** to be observed by all **Departments and Organisations under the Government and specified Bodies**
- General Financial Rules were **issued for the first time in 1947** bringing together in one place all existing orders and instructions pertaining to financial matters.
- These have subsequently been **modified and issued as GFRs 1963 and GFRs 2005.**

**Government e-Marketplace:**

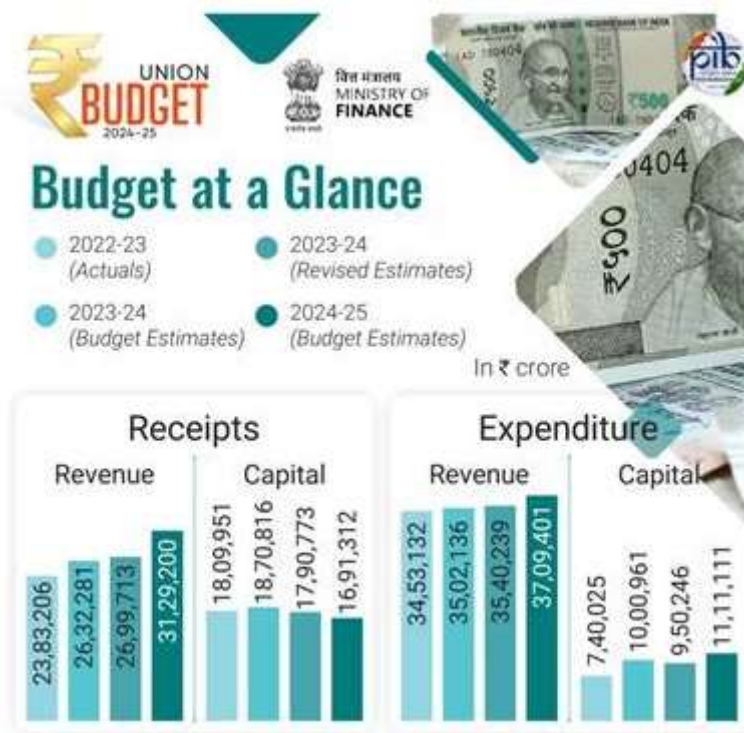
- **GeM** facilitates **online procurement of common use Goods & Services** required by various Government Departments / Organisations / PSUs.
  - The initiative was launched in **August 2016**, by the **Ministry of Commerce and Industry, Government of India.**
  - The current version of GeM, i.e., **GeM 3.0** was launched on **January 26, 2018.**
- It provides the **tools of e-bidding, reverse e-auction and demand aggregation** to facilitate the government users, achieve the best value for their money and aims to **enhance transparency, efficiency and speed in public procurement.**

## HIGHLIGHTS OF THE UNION BUDGET 2024-25

**Sub: Eco**

**Sec: Fiscal Policy**

The Union Minister of Finance and Corporate Affairs Smt. Nirmala Sitharaman presented the Union Budget 2024-25 in Parliament today. The highlights of the budget are as follows:



### Part-A

#### **Budget Estimates 2024-25:**

- Total receipts other than borrowings: ₹32.07 lakh crore.
- Total expenditure: ₹48.21 lakh crore.
- Net tax receipt: ₹25.83 lakh crore.
- Fiscal deficit: 4.9 per cent of GDP.
- Government aims to reach a deficit below 4.5 per cent next year.
- Inflation continues to be low, stable and moving towards the 4% target; Core inflation (non-food, non-fuel) at 3.1%.
- The focus of budget is on **EMPLOYMENT, SKILLING, MSMEs, and the MIDDLE CLASS.**

#### **Package of PM's five schemes for Employment and Skilling**

- Prime Minister's Package of 5 Schemes and Initiatives for employment, skilling and other opportunities for 4.1 crore youth over a 5-year period.
- 1. **Scheme A - First Timers:** One-month salary of up to ₹15,000 to be provided in 3 installments to first-time employees, as registered in the EPFO.
- 2. **Scheme B - Job Creation in manufacturing:** Incentive to be provided at specified scale directly, both employee and employer, with respect to their EPFO contribution in the first 4 years of employment.
- 3. **Scheme C - Support to employers:** Government to reimburse up to ₹3,000 per month for 2 years towards EPFO contribution of employers, for each additional employee.
- 4. **New centrally sponsored scheme for Skilling**
  - 20 lakh youth to be skilled over a 5-year period.
  - 1,000 Industrial Training Institutes to be upgraded in hub and spoke arrangements.
- 5. **New Scheme for Internship in 500 Top Companies to 1 crore youth in 5 years**

#### **Nine Budget Priorities in pursuit of 'Viksit Bharat':**

1. Productivity and resilience in Agriculture
2. Employment & Skilling



3. Inclusive Human Resource Development and Social Justice
4. Manufacturing & Services
5. Urban Development
6. Energy Security
7. Infrastructure
8. Innovation, Research & Development and
9. Next Generation Reforms

#### **Priority 1: Productivity and resilience in Agriculture**

- Allocation of `1.52 lakh crore for agriculture and allied sectors.
- New 109 high-yielding and climate-resilient varieties of 32 field and horticulture crops to be released for cultivation by farmers.
- 1 crore farmers across the country to be initiated into natural farming, with certification and branding in next 2 years.
- 10,000 need-based bio-input resource centres to be established for natural farming.
- Digital Public Infrastructure (DPI) for Agriculture to be implemented for coverage of farmers and their lands in 3 years.

#### **Priority 2: Employment & Skilling**

- As part of the Prime Minister's package, 3 schemes for 'Employment Linked Incentive' to be implemented - Scheme A - First Timers; Scheme B - Job Creation in manufacturing; Scheme C - Support to employers.
- To facilitate higher participation of women in the workforce,
  - working women hostels and crèches to be established with industrial collaboration
  - women-specific skilling programmes to be organized
  - market access for women SHG enterprises to be promoted

#### **Skill Development**

- New centrally sponsored scheme for Skilling under Prime Minister's Package for 20 lakh youth over a 5-year period.
- Model Skill Loan Scheme to be revised to facilitate loans up to `7.5 lakh.
- Financial support for loans upto `10 lakh for higher education in domestic institutions to be provided to youth who have not been eligible for any benefit under government schemes and policies.

#### **Priority 3: Inclusive Human Resource Development and Social Justice**

##### **Purvodaya**

- Industrial node at Gaya to be developed along the Amritsar-Kolkata Industrial Corridor.
- Power projects, including new 2400 MW power plant at Pirpainti, to be taken up at a cost of `21,400 crore.

##### **Andhra Pradesh Reorganization Act**

- Special financial support through multilateral development agencies of `15,000 crore in the current financial year.
- Industrial node at Kopparthy along Vishakhapatnam-Chennai Industrial Corridor and at Orvakal along Hyderabad-Bengaluru Industrial Corridor.

##### **Women-led development**

- Total allocation of more than `3 lakh crore for schemes benefitting women and girls.

##### **Pradhan Mantri Janjatiya Unnat Gram Abhiyan**

- Socio-economic development of tribal families in tribal-majority villages and aspirational districts, covering 63,000 villages benefitting 5 crore tribal people.

##### **Bank branches in North-Eastern Region**

- 100 branches of India Post Payment Bank to be set up in the North East region.

#### **Priority 4: Manufacturing & Services**

##### **Credit Guarantee Scheme for MSMEs in the Manufacturing Sector**

- A credit guarantee scheme without collateral or third-party guarantee in term loans to MSMEs for purchase of machinery and equipment.

##### **Credit Support to MSMEs during Stress Period**

- New mechanism to facilitate continuation of bank credit to MSMEs during their stress period.

##### **Mudra Loans**

- The limit of Mudra loans under 'Tarun' category to be enhanced to `20 lakh from `10 lakh for those who have successfully repaid previous loans.

### **Enhanced scope for mandatory onboarding in TReDS**

- Turnover threshold of buyers for mandatory onboarding on the TReDS platform to be reduced from `500 crore to `250 crore.

### **MSME Units for Food Irradiation, Quality & Safety Testing**

- Financial support to set up 50 multi-product food irradiation units in the **MSME sector**.

### **E-Commerce Export Hubs**

- E-Commerce Export Hubs to be set up under public-private-partnership (PPP) mode for MSMEs and traditional artisans to sell their products in international markets.

### **Critical Mineral Mission**

- **Critical Mineral Mission** to be set up for domestic production, recycling of critical minerals, and overseas acquisition of critical mineral assets.

### **Offshore mining of minerals**

- Auction of the first tranche of offshore blocks for mining, building on the exploration already carried out.

### **Digital Public Infrastructure (DPI) Applications**

- Development of DPI applications in the areas of credit, e-commerce, education, health, law and justice, logistics, MSME, services delivery, and urban governance.

### **Priority 5: Urban Development**

#### **Transit Oriented Development**

- Formulation of **Transit Oriented Development plans** and strategies to implement and finance 14 large cities above 30 lakh population.

#### **Urban Housing**

- Investment of `10 lakh crore, including the central assistance of `2.2 lakh crore in next 5 years, under PM Awas Yojana Urban 2.0 proposed to address the , housing needs of 1 crore urban poor and middle-class families.

#### **Street Markets**

- New scheme to support the development of **100 weekly 'haats'** or street food hubs every year for the next 5 years in select cities.

### **Priority 6: Energy Security**

#### **Energy Transition**

- Policy document on 'Energy Transition Pathways' to balance the imperatives of employment, growth and environmental sustainability to be brought out.

#### **Pumped Storage Policy**

- Policy for promoting pumped storage projects for electricity storage to be brought out.

#### **Research and development of small and modular nuclear reactors**

- Government to partner with private sector for R&D of Bharat Small Modular Reactor and newer technologies for nuclear energy, and to set up Bharat Small Reactors.

#### **Advanced Ultra Super Critical Thermal Power Plants**

- Joint venture proposed between NTPC and BHEL to set up a full scale 800 MW commercial plant using Advanced Ultra Super Critical (AUSC) technology.

#### **Roadmap for 'hard to abate' industries**

- Appropriate regulations for transition of 'hard to abate' industries from the current 'Perform, Achieve and Trade' mode to 'Indian Carbon Market' mode to be put in place.

### **Priority 7: Infrastructure**

#### **Infrastructure investment by Central Government**

- `11,11,111 crore (3.4 % of GDP) to be provided for capital expenditure.

#### **Infrastructure investment by state governments**

- Provision of `1.5 lakh crore for long-term interest free loans to support states in infrastructure investment.

#### **Pradhan Mantri Gram Sadak Yojana (PMGSY)**

- Launch of phase IV of PMGSY to provide all-weather connectivity to 25,000 rural habitations.

#### **Irrigation and Flood Mitigation**

- Financial support of `11,500 crore to projects such as the **Kosi-Mechi intra-state link** and other schemes in Bihar.
- Government to provide assistance to Assam, Himachal Pradesh, Uttarakhand and Sikkim for floods, landslides and other related projects.

## Tourism

- Comprehensive development of Vishnupad Temple Corridor, Mahabodhi Temple Corridor and Rajgir.
- Assistance for development of temples, monuments, craftsmanship, wildlife sanctuaries, natural landscapes and pristine beaches of Odisha.

## Priority 8: Innovation, Research & Development

- **Anusandhan National Research Fund** for basic research and prototype development to be operationalised.
- Financing pool of `1 lakh crore for **spurring private sector-driven research and innovation at commercial scale.**

## Space Economy

- Venture capital fund of `1,000 crore to be set up for **expanding the space economy by 5 times in the next 10 years.**

## Priority 9: Next Generation Reforms

### Rural Land Related Actions

- **Unique Land Parcel Identification Number (ULPIN)** or Bhu-Aadhaar for all lands
- Digitization of cadastral maps
- Survey of map sub-divisions as per current ownership
- Establishment of land registry
- Linking to the farmers registry

### Urban Land Related Actions

- Land records in urban areas to be digitized with GIS mapping.

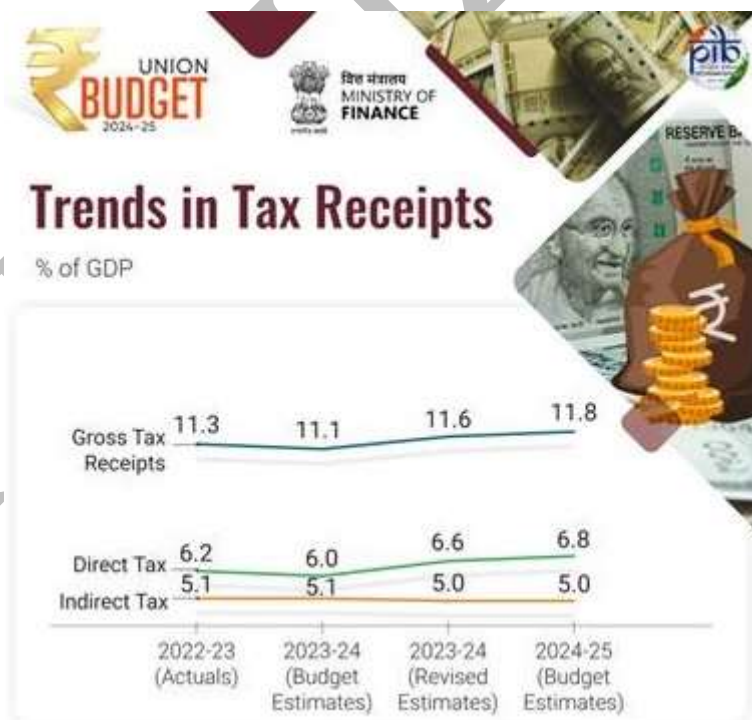
### Services to Labour

- Integration of **e-shram portal** with other portals to facilitate such one-stop solution.
- Open architecture databases for the rapidly changing labour market, skill requirements and available job roles.
- Mechanism to connect job-aspirants with potential employers and skill providers.

### NPS Vatsalya

- **NPS-Vatsalya** as a plan for contribution by parents and guardians for minors.

## PART B



## Indirect Taxes

### GST

- Buoyed by GST's success, tax structure to be simplified and rationalised to expand GST to remaining sectors.

### Sector specific customs duty proposals

### Medicines and Medical Equipment

- Three cancer drugs namely **TrastuzumabDeruxtecan, Osimertinib** and **Durvalumab** fully exempted from custom duty.
- Changes in **Basic Customs Duty (BCD)** on x-ray tubes & flat panel detectors for use in medical x-ray machines under the Phased Manufacturing Programme.

#### **Mobile Phone and Related Parts**

- BCD on mobile phone, mobile Printed Circuit Board Assembly (PCBA) and mobile charger reduced to 15 per cent.

#### **Precious Metals**

- Customs duties on gold and silver reduced to 6 per cent and that on platinum to 6.4 per cent.

#### **Other Metals**

- BCD removed on ferro nickel and blister copper.
- BCD removed on ferrous scrap and nickel cathode.
- Concessional BCD of 2.5 per cent on copper scrap.

#### **Electronics**

- BCD removed, subject to conditions, on oxygen free copper for manufacture of resistors.

#### **Chemicals and Petrochemicals**

- BCD on ammonium nitrate increased from 7.5 to 10 per cent.

#### **Plastics**

- BCD on PVC flex banners increased from 10 to 25 per cent.

#### **Telecommunication Equipment**

- BCD increased from 10 to 15 per cent on PCBA of specified telecom equipment.

#### **Trade facilitation**

- For promotion of domestic aviation and boat & ship MRO, time period for export of goods imported for repairs extended from six months to one year.
- Time-limit for re-import of goods for repairs under warranty extended from three to five years.

#### **Critical Minerals**

- **25 critical minerals** fully exempted from customs duties.
- BCD on two critical minerals reduced.

#### **Solar Energy**

- Capital goods for use in manufacture of solar cells and panels exempted from customs duty.

#### **Marine products**

- BCD on certain broodstock, polychaete worms, shrimp and fish feed reduced to 5 per cent.
- Various inputs for manufacture of shrimp and fish feed exempted from customs duty.

#### **Leather and Textile**

- BCD reduced on real down filling material from duck or goose.
- BCD reduced, subject to conditions, on methylene diphenyl diisocyanate (MDI) for manufacture of spandex yarn from 7.5 to 5 per cent.

#### **Direct Taxes**

- Efforts to simplify taxes, improve tax payer services, provide tax certainty and reduce litigation to be continued.
- Enhance revenues for funding development and welfare schemes of government.
- 58 per cent of corporate tax from simplified tax regime in FY23, more than two-thirds taxpayers availed simplified tax regime for personal income tax in FY 24.

#### **Simplification for Charities and of TDS**

- Two tax exemption regimes for charities to be merged into one.
- 5 per cent TDS rate on many payments merged into 2 per cent TDS rate.
- 20 per cent TDS rate on repurchase of units by mutual funds or UTI withdrawn.
- TDS rate on e-commerce operators reduced from one to 0.1 per cent.
- Delay for payment of TDS up to due date of filing statement decriminalized.

#### **Simplification of Reassessment**

- Assessment can be reopened beyond **three years upto five years from the end of Assessment Year** only if the escaped income is ₹ **50 lakh or more**.

- In search cases, time limit reduced from ten to six years before the year of search.

### **Simplification and Rationalisation of Capital Gains**

- **Short term gains** on certain financial assets to attract a tax rate of **20 per cent**.
- **Long term gains** on all financial and non-financial assets to attract a tax rate of 12.5 per cent.
- **Exemption limit of capital gains** on certain financial assets increased to **₹ 1.25 lakh per year**.

### **Tax Payer Services**

- All remaining services of Customs and Income Tax including rectification and order giving effect to appellate orders to be digitalized over the next two years.

### **Litigation and Appeals**

- ‘**Vivad Se Vishwas Scheme, 2024**’ for resolution of income tax disputes pending in appeal.
- Monetary limits for filing **direct taxes, excise and service tax** related appeals in Tax Tribunals, High Courts and Supreme Court increased to **₹60 lakh, ₹2 crore and ₹5 crore respectively**.
- **Safe harbour rules** expanded to reduce litigation and provide certainty in international taxation.

### **Employment and Investment**

- Angel tax for all classes of investors abolished to bolster start-up eco-system,.
- Simpler tax regime for foreign shipping companies operating domestic cruises to promote cruise tourism in India.
- Safe harbour rates for foreign mining companies selling raw diamonds in the country.
- Corporate tax rate on foreign companies reduced from 40 to 35 per cent.

### **Deepening tax base**

- Security Transactions Tax on futures and options of securities increased to 0.02 per cent and 0.1 per cent respectively.
- Income received on buy back of shares in the hands of recipient to be taxed.

### **Social Security Benefits.**

- **Deduction of expenditure** by employers towards NPS to be increased from **10 to 14 per cent** of the employee’s salary.
- Non-reporting of small movable foreign assets up to ₹20 lakh de-penalised.

### **Other major proposal in Finance Bill**

- **Equalization levy** of 2 per cent withdrawn.

### **Changes in Personal Income Tax under new tax regime**

- **Standard deduction** for salaried employees increased from ₹50,000 to ₹75,000.
- **Deduction** on family pension for pensioners enhanced from ₹15,000/- to ₹25,000/-
- Revised tax rate structure:

0-3 lakh rupees	0 per cent
3-7 lakh rupees	5 per cent
7-10 lakh rupees	10 per cent
10-12 lakh rupees	15 per cent
12-15 lakh rupees	20 per cent
Above 15 lakh rupees	30 per cent

- Salaried employee in the new tax regime stands to save up to ₹ 17,500/- in income tax.



## Tax Clearance Certificate Requirement for Travel Abroad

**Sub: Eco**

**Sec: Fiscal Policy**

- **Clarification by Government:**
  - The government clarified that **not all residents** need to obtain a tax clearance certificate for traveling abroad.
  - This requirement applies only to individuals accused of **financial irregularities** or those with **significant tax arrears**.
- **Union Budget Proposal:**
  - The Union Budget proposal initially suggested mandatory tax clearance certificates for all residents going abroad, causing public concern.
  - However, this requirement is limited to specific cases, particularly under the **Black Money Act, 2015**, as mentioned in the Finance Bill.
- **Existing Provisions:**
  - **Section 230 of the Income Tax Act, 1961**, does not require all individuals to obtain a tax clearance certificate.
  - The **Income Tax Department's 2004 notification** specifies that the certificate is necessary only in cases of:
    - **Serious financial irregularities**

- **Investigations under the Income Tax or Wealth Tax Act** that require the individual's presence and may result in a tax demand.
- **Direct-tax arrears exceeding ₹10 lakh**, provided these arrears have not been stayed.
- **Approval Process:**
  - A person may be asked to obtain a tax clearance certificate only after the Income Tax Department has recorded the reasons and obtained approval from the **Principal Chief Commissioner of Income-tax** or the **Chief Commissioner of Income-tax**.

## Can States Tax Mining Activities?

**Sub: Eco**

**Sec: Fiscal Policy**

**Recent Supreme Court Ruling:**

- On July 25, the Supreme Court **affirmed that States have the legislative authority to impose taxes on minerals** in addition to the royalty levied by the Centre.
- This ruling, delivered in an **8:1 decision**, emphasized the **principles of federalism**.
- It clarified that the power of State legislatures to tax mineral activities is **not constrained by Parliament's Mines and Minerals (Development and Regulation) Act, 1957 (1957 Act)**.
- **Chief Justice of India (CJI) D.Y. Chandrachud** authored the majority opinion, with **Justice B.V. Nagarathna dissenting**, concerned about potential negative impacts on mineral resource development.

**Case Background:**

- **Section 9 of the 1957 Act** requires mining leaseholders to pay royalty for extracted minerals.
- The key issue was whether **royalties are classified as "tax"** and which entity (Centre or States) has the authority to impose such charges.
- The dispute began with **India Cement Ltd challenging a cess imposed by Tamil Nadu**, arguing it effectively taxed royalties, which they contended was beyond the State's legislative power.

**Historical Precedents:**

- A **seven-judge Bench in 1989** ruled that **States could collect royalties but not impose additional taxes on mining activities**.
- The ruling was based on the **Union's overriding authority under Entry 54 of the Union List** to regulate mines.
- A **five-judge Bench in 2004** questioned the 1989 ruling but could not amend it due to the smaller bench size.
- The issue was referred to a **nine-judge Bench in 2011** due to conflicting judgments.

**Royalty vs. Tax:**

- The Supreme Court distinguished **royalty** as a "contractual consideration" paid by the mining lessee to the lessor for mineral extraction rights.
- In contrast, a **tax** is an "**imposition by a sovereign authority**" and can only be levied by public authorities for public funding.
- **Royalties are not classified as taxes**, hence they do not fall under the category of "taxes on mineral rights" in Entry 50 of the State List.

**Legal Provisions and State Authority:**

- **Entry 50 of the State List** grants States the authority to legislate on "taxes on mineral rights", subject to any laws Parliament enacts on mineral development.
- **Entry 54 of the Union List** provides the Centre with the power to regulate mines and mineral development.
- The 1957 Act **does not prevent States from imposing taxes on mineral rights**, although Parliament can set limitations or prohibitions.

**Dissenting Opinion:**

- Justice Nagarathna argued that **royalties under the 1957 Act should be considered a tax**, emphasizing the Act's intention to promote mineral development.
- She warned that allowing States to impose additional levies could lead to **uncoordinated and uneven increases in mineral costs**, potentially disrupting market stability.

**Next Steps:**

- The court will decide on **July 31** whether the ruling should apply **retroactively or prospectively**, impacting potential financial benefits for mineral-rich States such as West Bengal, Odisha, and Jharkhand.

**Background:**



- **Royalties and Their Nature:**
  - Royalties are payments made to the owner of a product for the right to use that product. In mining, royalties are fees paid by entities holding mining leases to the landowner, which can be the state government.
  - The debate over whether royalties constitute a tax has been ongoing, with previous legal interpretations causing confusion.
- **Historical Context:**
  - In the *India Cement* case, the Supreme Court mistakenly labeled royalties as taxes, leading to legal debates that were later revisited in the 2004 *State of West Bengal v. Kesoram Industries Ltd.* case, which attempted to correct the error but could not overrule the earlier decision due to the smaller size of the bench.
- **Recent Clarification:**
  - The recent ruling in the *Mineral Area Development Authority* case clarified the nature of royalties, resolving ambiguities and affirming that royalties are not taxes.

#### About MMDRA 1957:

The Mines and Minerals (Development and Regulation) Act, 1957 regulates *the mining sector in India. It outlines procedures for granting mining rights, classifies minerals, and aims for sustainable development and management of mineral resources.*

### Why the Latest RBI Jobs Data Show a Bump Up in Employment

#### Sub: Economy

#### Sec: Inflation and employment

#### Significant Increase in Employment

- **Employment Growth:** Employment growth in India jumped by nearly 6% in FY24, compared to an increase of 3.2% in FY23.
- **Workforce Increase:** The workforce increased by approximately 4.67 crore to 64.33 crore in FY24, up from 59.67 crore in FY23.

#### RBI's Data Insights

- **KLEMS Database:** The employment growth data comes from the RBI's India KLEMS (Capital, Labour, Energy, Material, and Services) database.
- **Industry Coverage:** The KLEMS database covers 27 industries, providing estimates at broad sectoral levels (agriculture, manufacturing, services) and all-India levels.
- **Historical Data:** Employment growth rates in previous years were 5.1% in FY21 and 3.3% in FY22.

#### Key Metrics Tracked

- **Metrics Included:** The KLEMS database tracks various metrics, including Gross Value Added (GVA), Gross Value of Output (GVO), Labour Employment (L), Labour Quality (LQ), Capital Stock (K), Capital Composition (KQ), consumption of Energy (E), Material (M), Services (S) inputs, Labour Productivity (LP), and Total Factor Productivity (TFP).

#### Contrasting Perspectives

- **Citigroup Report:**
  - **Skepticism on Employment Growth:** Citigroup's report suggested that even with a 7% GDP growth rate, India might struggle to create sufficient employment opportunities due to its demographic dividend.
  - **Unemployment and Job Quality:** The report highlighted issues around the quality of jobs and possible underemployment, noting that agriculture, which accounts for 46% of all employment, contributes less than 20% of GDP.
- **Labour Ministry's Rebuttal:**
  - **Positive Employment Data:** The Ministry of Labour and Employment refuted Citigroup's claims, citing comprehensive employment data from the PLFS and RBI's KLEMS.
  - **Employment Opportunities:** The Ministry pointed out that more than 8 crore employment opportunities were created between 2017-18 and 2021-22, averaging over 2 crore jobs per year.
  - **EPFO Subscribers:** Additionally, over 6.2 crore net subscribers joined the Employees' Provident Fund Organisation (EPFO) from September 2017 to March 2024.

#### Implications and Observations

- **Growth Amid Challenges:** Despite macroeconomic challenges, including the impact of demonetization, GST rollout, and the COVID-19 pandemic, the data suggests significant employment growth.
- **Sectoral Contributions:** The agriculture, manufacturing, and services sectors have contributed differently to employment and GDP, highlighting structural issues in job creation and economic contributions.



- **Formalization of Economy:** The rise in formalization has led to robust tax collections but has implications for the informal sector's employment generation capabilities.

## Rising EPFO and NPS Subscribers Point to Surge in Formal Jobs

### Sub: Economy

#### Sec: Unemployment and Inflation

**Context: Formal employment in India is increasing**, as evidenced by the significant rise in new subscribers to both the Employees Provident Fund Organisation (EPFO) and the National Pension System (NPS).

- This trend indicates **growing formalization of the workforce** and highlights the importance of statutory compliance by large employers to maintain an organized and productive workforce.

#### **EPFO Trends**

- **Subscriber Growth:**
  - New EPFO subscribers increased from **61.1 lakh in 2018-19 to over 1.31 crore in 2023-24**.
  - From September 2017 to March 2024, **more than 6.2 crore new subscribers were added**.
  - Despite a dip in new subscribers for 2023-24 compared to the previous fiscal year, the long-term trend shows substantial growth.
- **Mandatory Enrollment:**
  - **Organizations with 20 or more employees** are required to enroll their workers under EPF.
  - EPF registration is **mandatory for salaried employees earning at least ₹15,000 per month**.
- **Workforce Formalization:**
  - The number of contributing members to the provident fund has been growing at a **CAGR of over 20% since 2018**.
  - The overall workforce has grown at about 2%, indicating significant formalization.
- **Factors Driving Formalization:**
  - Large employers seek to **maintain an engaged and productive workforce with low attrition rates**.
  - **Payment of statutory compliances for social security** is seen as a key factor in retaining employees.
  - **Industries such as FMCG, healthcare, retail, and industrial manufacturing** have prioritized workforce formalization post-pandemic.
- **Youth Employment:**
  - In April, the EPFO recorded its **highest-ever monthly increase of 18.92 lakh net members**, marking a 10% year-on-year growth.
  - Over 55% of new subscribers are in the **18-25 age group**, indicating a high number of first-time job seekers entering the organized workforce.

#### **NPS Trends**

- **Subscriber Growth:**
  - In 2023-24, the NPS registered more than **75 lakh new subscribers**, marking a 30% increase from the previous year.

#### **Economic Implications**

- **Impact on Low-Income Jobs:**
  - EPFO data primarily capture low-income jobs. The **declining share of low-income jobs** suggests an increase in better-paid job opportunities in the economy.
- **Future Prospects:**
  - The anticipated **implementation of new labour codes** could further accelerate the formalization of the workforce.

#### **Conclusion**

The significant rise in EPFO and NPS subscribers underscores the **increasing formalization of employment in India**. This trend is driven by **large employers' need for a stable and compliant workforce**, along with government efforts to ensure **timely payments and social security benefits** for employees. The growth in formal employment, particularly among the youth, is a positive sign for the Indian economy, suggesting **better job opportunities** and improved workforce management.

## Flare-Up in Vegetable Prices Stalls Overall Disinflationary Trend

### Sub: Eco

#### Sec: Inflation and Unemployment

- **Consumer Price Inflation:**
  - **Consumer price inflation rose to 5.1% in June from 4.8% in May.**
  - The increase in inflation was primarily due to a surge in **vegetable prices**.
  - The **28 basis points (bps)** rise in inflation stemmed from a **positive momentum of 133 bps**, outweighing a favorable base effect of **106 bps**.
- **Factors Affecting Inflation:**
- **Food Inflation:**
- **Food inflation firmed up to 8.4% in June from 7.9% in May.**
- The positive price momentum of **269 bps in food** significantly contributed to the rise.
- **Fuel Inflation:**
- Fuel inflation saw a slight **positive momentum of 6 bps**.
- **Deflation in LPG prices continued**, while growth in kerosene and electricity prices moderated.
- **Core Inflation:**
- **Core inflation saw a positive momentum of 12 bps.**
- **Vegetable Prices:**
  - **Vegetable prices continued to record a double-digit rise year-on-year (YoY).**
  - The persistent rise in **vegetable prices** played a significant role in halting the disinflationary trend.
- **Insights and Observations:**
  - The view that **food price shocks are transitory** is not supported by the past year's experience.
  - The past year's prolonged **food price shocks** suggest that these shocks cannot be considered transitory.
  - **Sporadic spikes in various vegetable prices** have contributed to a persistent inflationary trend in the food category.
- **Implications:**
  - **Food prices are dominating the behavior of headline inflation.**
  - The gains achieved through the **reduction of core and fuel inflation**, facilitated by a combination of **monetary policy and supply management**, are being undermined by the surge in food prices.

#### Conclusion:

- The recent **spike in vegetable prices** has interrupted the overall disinflationary trend in the Indian economy.
- Despite efforts to control core and fuel inflation, **food prices, particularly vegetables**, have shown persistent and sporadic spikes, challenging the notion that food price shocks are merely transitory.
- This highlights the need for more robust measures to manage **food price volatility** and sustain the disinflationary momentum.

#### Inflation

Inflation is the rate at which the *general level of prices for goods and services rises, eroding purchasing power over time.*

#### Core and Headline Inflation

Aspect	Headline Inflation	Core Inflation
<b>Definition</b>	Total inflation in the economy including all items such as food, energy, and other goods and services.	<b>Excludes volatile items</b> such as food and energy prices to provide a clearer picture of long-term inflation trends.
<b>Measurement</b>	Calculated based on the overall changes in the Consumer Price Index (CPI).	Calculated by <b>removing food and energy prices from the CPI</b> .
<b>Importance</b>	Reflects the overall cost of living, directly affecting consumers. Used to understand the general inflation trend and its immediate impact.	Identifies long-term inflationary trends, focusing on less volatile and more persistent prices.
<b>Implications for Monetary Policy</b>	Considered by central banks to set interest rates and other policy measures. <b>High headline inflation may lead to tighter monetary policy (higher interest rates).</b>	Relied upon by central banks to gauge the effectiveness of policy measures. <b>Persistent core inflation can indicate long-term inflationary pressures, influencing monetary policy.</b>
<b>Examples</b>	Increase in oil prices due to geopolitical tensions causes a sharp rise in headline inflation. Seasonal variations in food prices due to harvest	Excludes the sharp increase in oil prices, focusing on stable price changes in goods and services. Provides a consistent measure by removing the

periods lead to fluctuations in headline inflation.

temporary impact of seasonal food price changes.

- **Demand-Pull Inflation**
  - **Definition:** Occurs when the *demand for goods and services exceeds supply, leading to higher prices.*
  - **Causes:** Increased consumer spending, government spending, or investment.
  - **Example:** An economic boom where consumers and businesses are spending more, driving up prices.
- **Cost-Push Inflation**
  - **Definition:** Happens when the *costs of production increase, leading to higher prices for final goods and services.*
  - **Causes:** Rising wages, increased prices for raw materials, and supply chain disruptions.
  - **Example:** A spike in oil prices leading to higher transportation and production costs.
- **Hyperinflation**
  - **Definition:** Extremely rapid and out-of-control inflation, often exceeding 50% per month.
  - **Causes:** Severe economic instability, excessive money supply, loss of confidence in the currency.
  - **Example:** Zimbabwe in the late 2000s, where inflation reached astronomical levels.
- **Deflation**
  - **Definition:** A *decrease in the general price level of goods and services.*
  - Actual decrease in price levels. Disinflation is still positive inflation, just at a slower pace.
  - **Causes:** Reduced consumer spending, lower demand, excess supply.
  - **Example:** The Great Depression in the 1930s, where prices fell significantly due to decreased demand.
- **Stagflation**
  - **Definition:** A situation *where the economy experiences stagnant growth, high unemployment, and high inflation* simultaneously.
  - **Causes:** Supply shocks, inappropriate monetary policies.
  - **Example:** The 1970s oil crisis, *where oil prices soared, leading to high inflation and economic stagnation.*
- **Reflation**
  - **Definition:** Measures taken by the government to *increase inflation to counteract deflationary pressures.*
  - **Causes:** Monetary policies like lowering interest rates, fiscal stimulus.
  - **Example:** Post-recession policies aimed at *boosting economic activity and prices.*
- **Disinflation**
  - **Definition:** Disinflation refers to a slowdown in the rate of inflation. In other words, it represents a *decrease in the rate at which prices are rising.*
  - Unlike deflation, which is a decrease in the general price level of goods and services, *disinflation still involves increasing prices, but at a slower rate than before.*

## End of indexation benefit on property sale has ignited a debate

**Subject: Eco**

**Sec: Inflation**

**Context:**

The Budget proposed to remove the indexation benefit available for calculation of any long-term capital gains available for property, gold and other unlisted assets.

**More about News:**

- Several quarters against the **capital gains tax regime** announced in Budget 2024-25.
- **Nominal real estate returns** are generally in the **region of 12-16 per cent per annum, much higher than inflation.**
- Proposed to **remove the indexation benefit available for calculation of any long-term capital gains available for property, gold and other unlisted assets.**
- It also **proposed to rationalise capital gains tax on these assets at 12.5 per cent as against 20 per cent earlier that came with indexation benefit.**
- Tax incidence for the **new rate without indexation may be lower for properties held for shorter durations.**

**Indexation benefit:**

- Indexation is used to **adjust the purchase price of an investment to reflect the effect of inflation on it.** The government has clarified that the **indexation benefit for properties bought after 2001 will be removed while retaining it for properties bought before 2001.**

### Capital gain:

- Capital gain is denoted as the **net profit that an investor makes after selling a capital asset exceeding the price of purchase.**

### Major changes brought about in the taxation of capital gains by the Finance Bill, 2024:

- The taxation of capital gains has been **rationalised and simplified**. There are **5 broad parameters to this rationalisation and simplification**, namely:-
  1. **Holding period has been simplified.** There are only two holding periods now, viz. **1 year and 2 years.**
  2. Rates have **been rationalised and made uniform for majority of assets.**
- Indexation has been done away with for **ease of computation with simultaneous reduction of rate from 20% to 12.5%.**
  1. **Parity between Resident and Non-resident.**
  2. **No change in roll over benefits.**

### Overall rationale for changes:

- **Simplification of any tax structure** has benefits of **ease of compliance viz computation, filing, maintenance of records.** This also **removes the differential rates for various classes of assets.**

## Current State of Employment in India

### Sub: Eco

### Sec: Inflation and unemployment

The Union Budget for 2024-25 places a **strong emphasis on employment, highlighting several initiatives aimed at addressing job creation and unemployment.**

- **Workforce Composition:** As of 2022-23, India's workforce is approximately 56.5 crore, with 45% in agriculture, 11.4% in manufacturing, 28.9% in services, and 13% in construction.
- **Unemployment Rate:** The official unemployment rate was 3.2%, but this figure may not fully capture underemployment and the large number of people in informal sectors.
- **Urban and Youth Unemployment:** Urban unemployment was 6.7%, and youth unemployment stood at 10%.
- **Salaried Workers:** The proportion of regular salaried workers decreased from 22.8% in 2017-18 to 20.9%, with many lacking formal contracts or social security benefits.

### Budget Schemes for Employment Generation

- **First-Time Employee Subsidy:**
  - Provides a wage subsidy of up to ₹15,000 for hiring first-time employees, paid in three instalments, covering up to one crore people.
- **Manufacturing Sector Incentives:**
  - Offers wage subsidies for hiring in the manufacturing sector, with up to 24% of a ₹25,000 monthly wage covered for four years.
- **Employer Subsidies for New Hires:**
  - Reimburses employers up to ₹3,000 of their monthly EPFO contribution for hiring new workers.
- **Industrial Training and Skilling:**
  - Plans to upgrade Industrial Training Institutes and enhance skilling efforts, benefiting approximately 20 lakh students.
- **On-the-Job Skilling:**
  - Aims to provide internships to one crore youth with a monthly allowance of ₹5,000, with companies bearing training costs and 10% of the allowance.

### Expert Opinions and Challenges

- **Implementation Challenges:** Experts point out that the conditions and procedures for these schemes may hinder effective implementation, such as requiring financial literacy courses for employees to receive subsidies.
- **Structural Constraints:** Economists argue that the primary issue isn't high wage costs but insufficient demand and lack of private investment. They suggest focusing on stimulating demand by raising wages and investing in the MSME sector.
- **MSME Sector Focus:** There is a call for more **targeted support for MSMEs and labour-intensive sectors, which can have a multiplier effect on job creation.**

### Recommendations for Job Creation

- **Increase Wages in Key Sectors:** Raising wages in the MSME sector and labour-intensive industries can stimulate demand and consumption.

- **Enhance Employment Guarantee Schemes:** Expanding schemes like MGNREGA and creating similar programs for urban workers could provide direct support and boost consumption.
- **Focus on Formalizing Employment:** Creating formal jobs and ensuring social security benefits are crucial for absorbing the workforce exiting agriculture and informal sectors.

## Remittances to India Projected to Reach \$160 Billion by 2029: RBI

**Sub: Eco**

**Sec: Inflation and unemployment**

**Current and Projected Remittance Levels:**

- Remittances to India are expected to rise to **\$160 billion by 2029**, up from **\$115 billion in 2023**, according to the **RBI's latest Report on Currency and Finance (RCF)**.
- India is the world's largest recipient of remittances, accounting for **13.5% of the global total**.

**Significance to India's Economy:**

- The **remittances-GDP ratio** for India has grown from **2.8% in 2000 to 3.2% in 2023**.
- This ratio now surpasses the ratio of gross FDI inflows to GDP, which was **1.9% in 2023**, indicating the significant role of remittances in bolstering India's external sector.

**Labour Market Dynamics:**

- India is positioned to become the leading global supplier of labor as its **working-age population is expected to grow until 2048**, even as this demographic is declining in major advanced economies.
- This trend, coupled with the ongoing **skill upgradation of the workforce**, is likely to sustain high demand for Indian workers abroad, boosting inward remittances.

**Impact of Digitalisation:**

- The cost of sending remittances globally has decreased over time, largely due to **digitalisation**, making it **easier and cheaper for the diaspora to send money back to India**.

These insights from the RBI's report underline the growing **importance of remittances to India's economy and the potential for continued growth driven by demographic trends and digital advancements**.

## Private Sector Fuels Growth of NPS Assets

**Sub: Eco**

**Sec: Inflation and unemployment**

**Overall NPS Growth:**

- As of July 20, National Pension System (NPS) assets reached **₹12.69 lakh crore**, reflecting a **28.33% year-on-year (YoY) increase**, according to the latest PFRDA data.
- In the fiscal year 2023-24, NPS assets saw a **robust 30.5% YoY growth**, reaching **₹11.73 lakh crore** by the end of March 2024.

**Private Sector Contribution:**

- The private sector significantly contributed to this growth, with NPS assets in this sector growing by a remarkable **39.62% YoY** as of July 20, totaling **₹2.52 lakh crore**.
- The number of subscribers in the private sector rose to **57.44 lakh**, an increase of **9.12 lakh YoY**.

**Atal Pension Yojana (APY) Performance:**

- APY assets reached **₹38,827 crore** as of July 20, representing a **31.03% increase**.
- The Pension Fund Regulatory & Development Authority (PFRDA) onboarded **1.2 crore APY subscribers** in the fiscal year 2023-24, with a target of **1.3 crore** for the current fiscal year.
- So far, there has been a net addition of approximately **20 lakh APY subscribers** this fiscal year.

**Future Projections:**

- PFRDA stated that the pension regulator aims to reach **overall NPS assets of ₹15 lakh crore by March 2025**.
- New registrations for the National Pension Scheme and APY subscribers till July 23 in the current fiscal year stood at **2,58,957**.

These points highlight the robust growth in NPS assets, **particularly driven by the private sector, along with the expansion of APY, indicating strong participation and confidence** in India's pension schemes.

## Centre Likely to Move ILO Against India Employment Report

**Sub: Eco**

**Sec: Inflation and unemployment**

**Context:**

- India, a founding member of the International Labour Organization (ILO), is reportedly considering raising a complaint against the UN agency regarding its **India Employment Report, 2024**.
- **Report Details:**
  - **Released in March 2024**, the report by the ILO and the Institute of Human Development (IHD) claims that **83% of India's unemployed workforce** comprises youth.
  - The report also highlights that the proportion of unemployed youth with secondary or higher education has nearly doubled from **35.2% in 2000 to 65.7% in 2022**.
- **Government's Response:**
  - A senior official from the Union Labour Ministry expressed concerns that **the ILO's model for assessing employment does not accurately reflect India's situation**.
  - The Ministry plans to address these concerns with the ILO, noting that **India's employment landscape includes a growing number of entrepreneurs and formal employment**, as evidenced by increased participation in the Employees' Provident Fund Organisation and the Employees' State Insurance Corporation.
- **Data Discrepancy:**
  - The Indian government has previously questioned the accuracy of data from private agencies like the Centre for Monitoring Indian Economy (CMIE).
  - The government prefers **data from the Periodic Labour Force Surveys, which it claims provides a more accurate depiction of India's employment situation**.
- **Official Statement:**
  - Minister of State for Labour mentioned in the Lok Sabha that the **unemployment rate for youth in India** is showing a declining trend.
  - The government emphasizes that **employment generation and improving employability** are key priorities, with various initiatives being undertaken to address these issues.

## Is viability gap funding enough to power India's offshore wind dreams?

**Sub: Economy**

**Sec: Infrastructure**

### Government of India's Viability Gap Funding (VGF) Scheme for Offshore Wind Energy:

- The **Government of India** approved a **viability gap funding (VGF) scheme** worth **Rs 7,453 crore (\$890 million)** to promote offshore wind energy projects.
- **Rs 6,853 crore (~\$820 million)** is allocated for the **installation and commissioning of 1 GW of offshore wind energy projects**, with **500 MW** each off the coasts of **Gujarat and Tamil Nadu**.
- **Rs 600 crore (~\$70 million)** is designated for upgrading **ports Pipavav and Thoothukudi** to support these projects.
- The **Union Ministry of New and Renewable Energy (MNRE)** and the **Union Ministry of Power** will handle the cost and construction of power evacuation infrastructure.

### About the Viability Gap Funding (VGF) for Wind Energy in India:

- **VGF is a financial support mechanism to ensure infrastructure projects are commercially viable**, attracting **private investment** by **reducing the gap** between the project's cost and expected returns.
- The **1 GW offshore wind projects** are expected to generate approximately **3.72 billion units of renewable electricity annually**, reducing **2.98 million tonnes of CO2 emissions** per year for **25 years**.
- This initiative **aims to create a robust ecosystem for offshore wind energy**, facilitating the development of **37 GW** with an estimated investment of **Rs 4,500 billion**.

### Implementation Mechanism of VGF:

- Private developers will execute the projects through a bidding process, with the **Power Grid Corporation of India Limited** constructing the necessary power evacuation infrastructure.
- The **Ministry of New and Renewable Energy** will coordinate with other ministries and departments to ensure seamless implementation, while the **Ministry of Ports, Shipping and Waterways** will **support port development**.

### Anticipated Challenges:

- Concerns exist about whether the **VGF amount is sufficient** for **Independent Power Producers (IPPs)** to generate and sell offshore wind power at competitive rates to state DISCOMs.
- Considerations include **waiving customs duty on offshore wind turbine generators, submarine cables, and foundations** to address **supply chain limitations in India**.



- The **MNRE** may extend the **RLMM waiver** for **offshore wind turbines** or provide higher tariff restrictions to encourage manufacturing in India.

#### Conclusion

- The VGF scheme is a significant step towards a **greener, more sustainable India**, encouraging **state governments** to provide **additional subsidies** to **transform coastal areas** and create **employment opportunities**.
- The success of **offshore wind energy** in **India** requires **resolving power procurement risks** from **DISCOMs** and defining environmental standards for offshore wind.
- **Sectoral policies** need to enhance **domestic manufacturing, logistics, transport, employment generation, and security** in the **Indian Ocean**.
- Strengthening the **National Institute of Wind Energy's institutional capacity**, with offices in **Gujarat and Tamil Nadu**, is crucial for smooth project approval and development.

### NABARD Launches ₹750-Crore Agri Fund to Boost Innovation

#### Sub: Economy

#### Sec: Infrastructure

The National Bank for Agriculture and Rural Development (NABARD) has *introduced a new initiative aimed at fostering innovation in agriculture and rural enterprises*.

The initiative, known as the **Agri-SURE fund**, is designed to support start-ups and rural enterprises with a substantial financial backing.

- **Fund Size:** ₹750 crore
- **Managing Entity:** Nabventures, a wholly owned subsidiary of NABARD
- **Funding Contributors:**
  - NABARD: ₹250 crore
  - Agriculture Ministry: ₹250 crore
  - Other Institutions: ₹250 crore

#### Purpose and Structure

- **Objective:** The Agri-SURE fund aims to promote innovation in the agriculture sector by providing financial support to start-ups and rural enterprises.
- **Target Beneficiaries:** The fund is structured to support **approximately 85 start-ups**.
- **Investment Size:** Each start-up can receive **investments of up to ₹25 crore** by the end of the fund's term.

#### Implications

- **Innovation in Agriculture:** The fund is expected to **stimulate innovation in the agriculture sector by providing essential capital to start-ups** working on new technologies and methodologies.
- **Rural Development:** By supporting rural enterprises, the fund aims to contribute to the overall development of rural areas, **creating new jobs and enhancing the local economy**.
- **Collaboration:** The initiative highlights a collaborative approach between NABARD, the agriculture ministry, and other financial institutions, **pooling resources to create a substantial impact**.

### RBI Joins 'Project Nexus' for Instant Cross-Border Retail Payments

#### Sub: Economy

#### Sec: Monetary Policy

#### Overview:

The Reserve Bank of India (RBI) has joined "Project Nexus", an international initiative to enable instant cross-border retail payments by interlinking domestic Fast Payment Systems (FPSs).

#### About Project Nexus:

- **Conceptualization:** Developed by the Innovation Hub of the Bank for International Settlements (BIS).
- **Objective:** To connect the FPSs of four ASEAN countries (Malaysia, Philippines, Singapore, and Thailand) and India.
- **Founding Members:**
  - Bank Negara Malaysia (BNM)
  - Bank of Thailand (BOT)
  - Bangko Sentral ng Pilipinas (BSP)
  - Monetary Authority of Singapore (MAS)
  - Reserve Bank of India (RBI)

- **Special Observer:** Indonesia, involved from the early stages.

#### Significance:

- **Launch Timeline:** The platform is expected to go live by 2026.
- **Efficiency:** Aims to make retail cross-border payments efficient, faster, and more cost-effective.

#### RBI's Participation:

- **Collaboration:** RBI has been working bilaterally with various countries to link India's FPS – the Unified Payments Interface (UPI), with their respective FPSs for cross-border person-to-person (P2P) and person-to-merchant (P2M) payments.
- **Multilateral Approach:** Joining Project Nexus will enhance India's efforts in expanding the international reach of Indian payment systems beyond bilateral connections.

#### Impact:

- **Enhanced Efficiency:** Once operational, Nexus will significantly streamline cross-border retail payments, benefiting consumers and businesses alike.
- **Broader Reach:** The platform's scalability allows for the potential inclusion of more countries in the future, broadening the network and impact of efficient cross-border payments.

### Is the Bad Loan Problem Shifting to Individuals from Industries?

#### Sub: Economy

#### Sec: Monetary Policy

**Though Indian banks are in the pink of health, the RBI is worried about slippages and delinquencies.**

- **Historical Context:**
  - Until the mid-2010s, banks primarily lent massive loans to big industries.
  - Failures in these businesses resulted in significant bad loans that were initially hidden.
  - In 2015, the RBI carried out a review, uncovering these hidden bad loans.
  - **The share of bad loans reached as high as 10% in 2017, indicating that nearly one in every 10 loans had turned bad.**
- **Recovery Measures:**
  - Various debt recovery channels, including the Insolvency and Bankruptcy Code, 2016, were employed.
  - Banks managed to recover more bad loans, improving their financial health.
  - **As a result, Gross Non-Performing Assets (GNPA) reached a decadal low of 2.8%, and Net Non-Performing Assets (NNPA) was 0.6% in March 2024**
- **Shift to Retail Loans:**
  - **Reducing loans to industries meant banks had to look elsewhere to lend and earn.**
  - The mid-2010s saw an increase in loans to the retail sector, including personal loans, credit card receivables, and housing loans.
  - Proliferation of instant loan apps enticed consumers, leading to a debt trap.
  - **The share of retail loans grew significantly, surpassing loans to industries and services.**
- **Current GNPA Trends:**
  - **The GNPA ratio of personal loans has been reducing consistently, reaching 1.2% in March 2024** — the lowest across sectors
- **RBI's Concerns:**

Despite a generally positive outlook, the RBI has highlighted two signs of incipient stress:

- **Slippages:** Fresh additions of bad loans in a year.
  - **In FY24, slippages from retail loans (excluding home loans) formed 40% of fresh additions of NPAs**
- **Delinquency Levels:** Persistent delinquency can eventually turn an account into an NPA.
  - **Delinquency levels among small borrowers with personal loans below ₹50,000 remain high.**
  - Most of these loans were sanctioned by NBFC-Fintech lenders, major drivers behind digital lending apps.
  - **High delinquency levels persist in small finance banks and NBFC-Fintechs**
- **Future Outlook:**
  - **While the banking system appears mostly disease-free, the RBI is worried about the symptoms of slippages and delinquencies.**
  - This time, the focus of concern has shifted from industries to individuals.

## Summary:

- GNPA and NNPA trends from March 2015 to March 2024, showing a decadal low in March 2024.
- GNPA ratio by sector, with personal loans having the lowest ratio at 1.2% in March 2024.
- Bank-type wise split of slippages from retail loans in new NPAs, with retail loan slippages forming 40% of new NPAs in FY24.
- Delinquency levels for personal loans below ₹50,000, highlighting persistent high levels in small finance banks and NBFC-Fintechs.

## VRR: Banks Park Less than Notified Sum

### Sub: Economy

#### Sec: Monetary Policy

#### Key Highlights:

- **Surplus Liquidity Absorption:** The Reserve Bank of India (RBI) has observed that banks have parked significantly less than the notified amount for three consecutive days since the beginning of July.
- **Implication:** This indicates that while the *RBI is attempting to absorb surplus liquidity from the banking system in line with its "withdrawal of accommodation" monetary policy stance*, banks do not have a significant surplus to park.

#### Auction Details:

1. **Two-Day VRRR Auction (₹50,000 crore) - July 3, 2024:**
  - **Funds Deployed by Banks:** ₹25,145 crore
  - **Weighted Average Rate (WAR):**49%
2. **Three-Day VRRR Auction (₹75,000 crore) - July 2, 2024:**
  - **Funds Deployed by Banks:** ₹38,227 crore
  - **WAR:**49%
3. **Four-Day VRRR Auction (₹75,000 crore) - July 1, 2024:**
  - **Funds Deployed by Banks:** ₹4,200 crore
  - **WAR:**49%

#### Analysis:

- **Liquidity and Monetary Policy:** The overall system liquidity remains somewhat positive due to ongoing government spending.
- **Monetary Policy Objective:** The RBI's VRRR auctions aim to maintain the weighted average call rate (WACR) at or above 6.50%, aligning with its monetary policy stance.

#### Conclusion:

The recent VRRR auction results reflect a lower-than-notified participation by banks, suggesting **limited surplus liquidity in the banking system**. Despite the RBI's efforts to absorb excess liquidity, the banks' responses indicate a cautious approach, **influenced by the current economic and monetary policy environment**.

#### Variable Repo Rate:

- Variable Repo Rate allows **banks to borrow funds from RBI at rates determined through auctions, which may vary but typically remain above the Reverse Repo Rate**.
- **Example:** If RBI conducts a Variable Repo auction and the prevailing market rates are lower than the standard Repo Rate (6.5%), banks may bid to borrow funds from RBI at rates slightly above the Reverse Repo Rate (e.g., 3.5%). This allows banks to access liquidity at competitive rates for short-term needs.
- **Purpose:** Variable Repo Rate supports RBI's efforts to manage liquidity by providing banks with an alternative to the standard Repo operations. It ensures that banks can access funds at rates reflective of market conditions, facilitating smoother liquidity management in the banking system.

#### Variable Reverse Repo Rate (VRRR):

- VRRR allows RBI to conduct auctions **where banks bid to deposit excess funds at rates determined by market demand, rather than a fixed rate set by RBI**.
- **Example:** During a VRRR auction, banks bid to deposit funds with the RBI for a specified duration (e.g., 14 days). If market conditions suggest higher rates, banks may bid higher than the standard Reverse Repo Rate to earn a better return on their excess funds.
- **Purpose:** VRRR provides flexibility for RBI to manage liquidity effectively, especially when market rates differ significantly from the fixed Reverse Repo Rate. It ensures that RBI can absorb liquidity at rates aligned with prevailing market conditions, thereby enhancing the effectiveness of monetary policy operations

## Withdrawal of Accommodation

**Sub: Eco**

**Sec: Monetary Policy**

**Why in news?**

State Bank of India's economic research department said RBI will revisit its "withdrawal of accommodation" policy stance around September 2024, in line with its expectations.

**What does it mean?**

- An **accommodative stance** means the central bank is prepared to expand the **money supply to boost economic growth**.
- Withdrawal of accommodation means **reducing the money supply in the system** which will rein in inflation.
- **RBI has maintained a withdrawal of accommodation stance since June 2022**, to ensure that inflation remains within target, going forward, while supporting growth.
- Correspondingly, repo rate has been kept unchanged at 6.5%.

**Change in stance**

- RBI has maintained its stance of "to remain focused on withdrawal of accommodation to ensure that inflation progressively aligns to the target, while supporting growth" in June 2024.
- Decline in US inflation, creates ground for Fed rate cut by September 2024. This is expected to make RBI rethink its stance.

**Expansionary vs Contractionary Monetary Policy**

	<b>Expansionary</b>	<b>Contractionary</b>
<b>Goal</b>	To stimulate economic growth and increase aggregate demand.	Aims to slow down the economy and control inflation.
<b>Interest rate</b>	Interest rate is lowered to make borrowing affordable, which encourages spending and investment	Raising interest rate to make borrowing more expensive, to discourage spending.
<b>Impact on inflation</b>	Potentially lead to higher inflation.	Control inflation by reducing money supply.
<b>Employed during</b>	Economic slowdown or recession	Periods of high inflation
<b>Also called</b>	Loose money policy	Tight money policy

## Banks' Deposit Growth Dips to 10.6%; Credit Growth at 13.9% as of June 28

**Sub: Eco**

**Sec: Monetary Policy**

**Overview:**

- **Deposit growth of commercial banks** has slowed to **10.64%** for the fortnight ending June 28.
- **Credit growth** also saw a decline during this period.

**Key Statistics:**

- **Credit Growth:**
  - **13.88% year-on-year (Y-o-Y)** increase, reaching **Rs 163.8 trillion** as of June 28.
- **Deposit Growth:**
  - **10.64% Y-o-Y** increase, totaling **Rs 211.95 trillion**.

**Exclusion of HDFC Merger Impact:**

- The figures do not account for the impact of the **HDFC-HDFC Bank merger** which took effect on July 1, 2023.

**Comparative Data:**

- For the previous fortnight ending June 14:
  - **Deposit growth:** 12.1%
  - **Credit growth:** 15.6%

**RBI Concerns:**

- **RBI Governor** has highlighted the persistent gap between **credit and deposit growth** in a meeting with bank chief executives.

- Banks are encouraged to **enhance their liability franchise** to prevent deposit growth from constraining credit offtake.

#### Credit to Deposit (C/D) Ratio:

- **CareEdge Ratings** noted that the **C/D ratio** has hovered around **80%** since September 2023.
- For the fortnight ending June 14, 2024:
  - **C/D ratio:** 79.9%
  - **Excluding HDFC merger impact:** 77.9% compared to 75.5% on June 16, 2023.

#### Implications:

- The slowdown in deposit growth coupled with relatively high credit growth indicates potential pressures on **banks' ability to meet credit demand**.
- Efforts by banks to **shore up deposit growth** will be crucial in ensuring sustained credit offtake and maintaining financial stability.

#### Credit-Deposit Ratio Simplifier

The Credit-Deposit (CD) ratio is a *key banking metric that measures the proportion of a bank's total deposits given out as loans*. It reflects *how efficiently a bank uses its deposits to generate income*.

- **Regulatory Guidelines:**
  - The Reserve Bank of India (RBI) does not prescribe any specific CD ratio.
- **Ideal Range:**
  - An optimal CD ratio generally falls between **80-90%**.
- **Above 90%:** May indicate aggressive lending practices.
- **Below 80%:** Suggests underutilization of deposit base.
- **Implications:**
  - **High CD Ratio:** Indicates significant lending, which can lead to liquidity issues if not managed properly.
  - **Low CD Ratio:** Suggests insufficient lending, potentially reducing profitability.
- **Factors Influencing the CD Ratio:**
  - **Credit Growth:** Rising demand for loans increases the CD ratio.
  - **Deposit Growth:** Higher deposits can lower the CD ratio if lending does not grow proportionately.
  - **Economic Conditions:** Booms or recessions affect loan demand and deposit growth.

#### PPF Returns Still Languishing Lower than Formula-Based Rates

**Sub: Eco**

**Sec: Monetary Policy**

- **Interest Rates Below Formula-Based Rates:**
  - The Public Provident Fund (PPF) and five-year recurring deposits (RD) are earning rates lower than the formula-based system adopted since April 2016.
  - PPF Rate Static at 7.1% since April 2020.
  - Five-Year RD Rate gradually increased from 5.8% to 6.7% in the first three quarters of 2023-24.
- **RBI's Observation:**
  - RBI noted that PPF returns were 41 basis points (bps) lower than the formula-based rates for October to December 2023.
  - Five-year RD rates were 21 bps lower than the formula-based rates for the same period.
- **Formula for Quarterly Rate Resets:**
  - A panel led by former RBI Deputy Governor Shyamala Gopinath linked small savings rates to secondary market yields on government securities of comparable maturities.
- **Historical Rate Adjustments:**
  - Last PPF rate hike in October 2018 to 8%, reduced to 7.9% in July 2019, and further slashed to 7.1% in 2020-21.
  - Government reduced rates on all small savings instruments in the range of 50 to 140 bps at the onset of 2020-21.
- **Recent Rate Hikes Before Elections:**
  - Sukanya Samridhi Account Scheme (SSAS): Rate raised from 8% to 8.2%.
  - Three-Year Time Deposit: Rate increased from 7% to 7.1%.
  - No changes in PPF rate despite successive rate hikes on other small savings schemes.
- **Current Status:**



- Rates on most small savings schemes are aligned with formula-based rates except for PPF and five-year RD.
- The gap between the formula-based rate and the PPF and five-year RD rates was not quantified in the latest RBI report.
- **Tax-Free Scheme Defense:**
  - Finance Ministry defends PPF rate stasis by emphasizing its tax-free status, offering higher tax-adjusted returns.
  - Similar tax treatment for SSAS, which had its rate frozen at 7.6% from April 2020 to March 2023, then raised to 8% last April and 8.2% from January 2024.

## RBI introduces PCA framework to improve financial health of UCBs

**Subject: Eco**

**Sec: Monetary policy**

**Context:** The Reserve Bank of India (RBI) on Friday prescribed a Prompt Corrective Action (PCA) framework for relatively weak urban co-operative banks (UCBs), with deposits above ₹100 crore (upper tier category), to nurse them back to health.

**Details:**

- As per the framework, a financially unsound and ill-managed UCB can be brought under PCA if it breaches the risk thresholds of identified indicators pertaining to capital and profitability (net profit).
- Currently, there are around 1,500 UCBs in the country. RBI classifies UCBs as **Tier-I (deposits up to ₹100 crore); Tier-2 (more than ₹100 crore and up to ₹1,000 crore); Tier-3 (deposits more than ₹1,000 crore and up to ₹10,000 crore); and Tier-4 (above ₹10,000 crore). Tiers 2 to 4 come under the upper Tier.**
- RBI said the objective of the PCA Framework is to enable supervisory intervention at an appropriate time and require the UCBs to initiate and implement remedial measures in a timely manner, to restore their financial health
- The provisions of the PCA Framework will be effective from April 1, 2025.

### PCA matrix: Parameters, indicators and risk thresholds

Parameter	Indicator	Risk threshold 1	Risk threshold 2	Risk threshold 3
(1)	(2)	(3)	(4)	(5)
Capital (Breach of CRAR) <sup>2</sup>	CRAR - Minimum Regulatory Requirement, as applicable*	Up to 250 bps below the Indicator prescribed at column (2)	More than 250 bps but not exceeding 400 bps below the Indicator prescribed at column (2)	In excess of 400 bps below the Indicator prescribed at column (2)
Asset Quality	Net Non-Performing Advances (NNPA) Ratio	>=6.0% but <9.0%	>=9.0% but < 12.0%	>=12.0%
Profitability	Net profit	Incurred losses during two consecutive years	-	-

\* For Tier 2 to 4 UCBs, as per the glide path provided for achieving the regulatory minimum CRAR of 12% by March 31, 2026.

- RBI has prescribed three risk thresholds for invoking PCA for breach of CRAR (10 per cent as of March-end 2024, 11 per cent as of March-end 2025 and 12 per cent as of March-end 2026) below the regulatory minimum – up to 250 basis points (bps); more than 250 bps but not exceeding 400 bps; and more than 400 bps.
- In the case of NNPA, too three risk thresholds have been prescribed – greater than or equal to 6 per cent but below 9 per cent; greater than or equal to 9 per cent but below 12 per cent; and greater than or equal to 12 per cent.
- In the case of profitability, RBI has prescribed only one parameter “incurred losses during two consecutive years” for breach. In SAF too this was this parameter was prescribed.

## Mudra Loans: New Developments with Budget Boost

**Sub: Eco**

**Sec: Monetary Policy**

- **Introduction:**
  - Mudra loans, part of the Pradhan Mantri Mudra Yojana (PMMY), have been a crucial source of funding for small businesses, particularly benefiting women entrepreneurs.
- **Loan Categories:**
  - The Mudra scheme offers loans in three categories:



- **Shishu:** Loans up to ₹50,000
  - **Kishore:** Loans above ₹50,000 and up to ₹5 lakh
  - **Tarun:** Loans above ₹5 lakh and up to ₹10 lakh
- **Recent Budget Announcement:** Finance Minister Nirmala Sitharaman announced an increase in the **Tarun loan limit to ₹20 lakh** for entrepreneurs who have successfully repaid previous loans under this category.
- **Impact of the Budget Increase:**
  - The increase is anticipated to significantly enhance business growth, especially for those who have already benefitted from the scheme.
  - Women entrepreneurs, who constitute **70% of the beneficiaries**, are likely to see expanded opportunities.
- **Loan Disbursement Trends:**
  - **Steady Disbursement:** In the first quarter of FY25, Mudra loan disbursals exceeded ₹1 lakh crore, a rise from ₹81,957 crore in the previous year.
  - **Record Growth in FY24:** Disbursements reached a record **₹5 lakh crore**, surpassing the previous year's figure of ₹4.4 lakh crore.
- **Cumulative Impact:**
  - Since its inception in 2015, Mudra loans have totaled over **₹30 lakh crore** in disbursements.
- **Regional and Institutional Performance:**
  - **State Performance:** States like **Uttar Pradesh, Bihar, and Tamil Nadu** lead in Mudra loan disbursals.
  - **Institutional Leaders:** Public sector banks, especially the **State Bank of India, Punjab National Bank, and Canara Bank**, have been at the forefront of Mudra loan disbursements.
- **Factors Driving Growth:**
  - **Bank Initiatives:** Public sector banks are actively promoting these loans and ensuring proper fund utilization through regular follow-ups and customer interactions.
  - **Guarantee Support:** The **National Credit Guarantee Trustee Company Ltd. (NCGTC)** provides guarantees for eligible micro-units under PMMY, boosting lender confidence.

The Mudra scheme's expansion and increased loan limits are poised to **foster further growth and empowerment among small business owners, particularly women, while also ensuring that more resources are available to sustain and expand their enterprises.**

## How Can State Capacity Be Measured?

### Sub: Economy

#### Sec: National Income

**State capacity** refers to the ability of a state to successfully deliver public goods and services to its citizens. It is considered by many public policy experts to be the **major factor that explains why some countries are rich or developed while others remain underdeveloped.**

#### Common Measures of State Capacity

- **Tax Revenues:**
  - **Tax to GDP Ratio:** The most common way to measure state capacity is by its ability to collect sufficient tax revenues.
  - Countries with a higher tax to GDP ratio, typically rich countries, are considered to possess greater state capacity.
  - **Example:** Developing countries like India are often urged to boost their tax to GDP ratio to build state capacity.
- **Employment in Public Sector:**
  - **Number of Public Officials:** Another indicator is the number of people employed by the state.
  - **Police Officials per Capita:** Indicates the state's capacity to maintain law and order.
  - **Judges and Courts per Capita:** Reflects the state's ability to deliver justice.

#### Criticisms of Traditional Measures

- **Efficiency vs. Size:**
  - **Efficiency Argument:** More efficient states may deliver public goods with lower taxes and fewer staff.
  - Critics argue that the number of public employees and the amount of taxes collected only reflect the state's size, not its effectiveness.
- **Causal Link Between State Capacity and Success:**

- **Tautological Attribution:** Critics like U.S. economist Bryan Caplan argue that attributing the success of rich countries solely to strong state capacity is tautological.
- **Economic Growth Argument:** It could be that strong economic growth allowed developed countries to fund larger states, rather than large states causing economic success.

#### Alternative Measures

- **Upholding Rule of Law:**
  - **Delivering Efficient Justice:** A better way to measure state capacity, according to critics, is to gauge a state's ability to uphold the rule of law and deliver efficient justice to its citizens, regardless of its size as measured by tax collections or headcount.

## India Faces High Debt but Sustainable for Now: NCAER

### Sub: Economy

#### Sec: National Income

India's public debt is very high, almost 82% of GDP, but the country doesn't face a debt-sustainability issue due to its high growth rate and the higher share of local-currency debt, according to NCAER.

#### Key Points:

- **High Debt Levels:**
  - **Current Situation:** India's public debt stands at nearly 82% of GDP.
  - **Sustainability:** Despite high debt levels, the situation is sustainable for now because of higher real or nominal GDP and the fact that most of the debt is held in rupees.
- **State-Level Debt:**
  - **Proportion of Debt:** States collectively hold one-third of the total debt.
  - **Future Projections:** In a 'business-as-usual' scenario, state debt levels are expected to increase over the next five years.
  - **Example:** In states like Punjab and Himachal Pradesh, the **Debt-to-GDP ratio could increase by 50%**.
- **Factors Supporting Debt Sustainability:**
  - **Implicit Guarantee:** States, including the most indebted ones, do not face sustainability issues due to the implicit guarantee of the Centre.
  - **Debt Characteristics:** States cannot hold debt in foreign currency or at a floating rate, reducing associated risks.
- **Comparison of States:**
  - **Interest Rates:** Most indebted states ironically fare better because the interest rate is similar for all states.
  - **Debt Maturity:** More indebted states often hold longer maturity debt and pay little premium.
- **Policy Recommendations:**
  - **Incentives for Prudent States:** NCAER highlighted the need for more prudent states to receive a better deal as they are effectively subsidising the more indebted states.
  - **Finance Commission's Role:** NCAER suggested that the **Finance Commission should reward fiscally prudent states and incentivise profligate ones to become more fiscally responsible.**

**Summary:** India's public debt is high but sustainable due to its economic growth and local currency debt structure. State-level debt is projected to increase, but the implicit central guarantee and debt characteristics support sustainability. Policy changes are recommended to reward fiscally prudent states and promote fiscal responsibility among more indebted ones.

#### National Council for Applied Economic Research (NCAER)

- **Established:** 1956
- **Nature:** India's oldest and largest independent, non-profit, economic policy research institute.
- **Function:** Undertakes grant-funded research and commissioned studies for governments and industry. It is one of the few think tanks globally that also collect primary data.

#### Key Thematic Areas of Work:

- **Growth, Macro, Trade, and Economic Policy:**
  - Focuses on macroeconomic stability, economic growth, trade policies, and overall economic policy formulation.
- **Investment Climate, Industry, Infrastructure, Labor, and Urban:**
  - Analyzes the business environment, industrial performance, infrastructure development, labor markets, and urbanization.

- **Agriculture and Rural Development, Natural Resources, and Environment:**
  - Studies agricultural policies, rural development strategies, sustainable use of natural resources, and environmental conservation.
- **Poverty, Equity, Human Development, and Consumers:**
  - Investigates issues related to poverty alleviation, social equity, human capital development, and consumer behavior and protection.

#### Significance:

- **Independent and Non-Profit:** NCAER operates independently without any profit motive, ensuring unbiased and rigorous research output.
- **Primary Data Collection:** Unlike many think tanks, NCAER collects primary data, which enhances the accuracy and reliability of its research findings.
- **Policy Impact:** The institute's research supports informed policy-making that addresses India's socio-economic challenges and fosters sustainable development.

### Behind Russia's High Income

#### Sub: Economy

#### Sec: National Income

#### Recent Upgrade by the World Bank

- **Russia's Status:** Upgraded from an 'upper-middle income' to a 'high-income' country.
- **Previous Status:** Last had high-income status in 2014.
- **Determining Factors:**
  - **Growth in Trade:** +6.8%
  - **Financial Sector:** +8.7%
  - **Construction:** +6.6%
  - **Real GDP:** Increased by 3.6%
  - **Nominal GDP:** Increased by 10.9%

#### Economic Context

- **Impact of War Economy:** The growth is attributed to a significant increase in military-related activities.
- **IMF Assessment:** Signs of overheating in the Russian economy.

#### Classification Criteria

- **World Bank's Classification:** Based on per-capita gross national income (GNI) in US dollars.
- **Threshold for High-Income:** \$14,005 or more.
- **Russia's Per-Capita GNI:** \$14,250.
- **Other New High-Income Countries:** Bulgaria (\$14,460) and Palau (\$14,250).

#### Ukraine's Economic Upgrade

- **New Status:** From lower-middle-income to upper-middle-income.
- **Growth Factors:**
  - **Resumption of Economic Activity:** Especially in western and northern parts of Ukraine.
  - **Real GDP Growth:** 5.3% in 2023.
  - **Population Decline:** More than 15% since the invasion.
  - **Construction Activity:** 24.6% increase.
  - **Investment Spending:** 52.9% increase.

#### Global Context

- **2023 Income Levels:**
  - **South Asia:** Only 13% low-income.
  - **Middle East and North Africa:** 10% low-income.
  - **Latin America and the Caribbean:** 44% high-income.
  - **Europe and Central Asia:** 69% high-income.

#### Resilience of Russia's Economy

- **Sanctions Impact:** Russia under more individual sanctions than Iran, Cuba, and North Korea combined.
- **Recovery Factors:**

- **Fiscal Stimulus:** Including military spending and credit expansion.
- **Trade Diversion:** Shift to China, India, Türkiye, Central Asia, and the South Caucasus.
- **Currency Shift:** Trade in sanctioning countries' currencies fell from 80% in 2021 to less than 30% in 2023.
- **Job Market:** Strong with record low unemployment and rising wages.
- **Consumer Spending:** Propelled by a strong labor market.

### Why Sanctions Haven't Worked

- **Oil Sector:**
  - **Sanctions Design:** Not as tight as those on Venezuela or Iran.
  - **Global Oil Prices:** Elevated prices and reduced discount on Russian oil.
  - **Export Volumes:** Steady with increased exports to China and India.
- **Investments:**
  - **Corporate Investment:** Recovered since 2022, contributing 4.5% to GDP growth.
  - **Manufacturing and Defense:** Increased investments.
  - **Domestic Goods Substitution:** Investments in new production facilities.
  - **Multinational Corporations:** Some have stayed, anticipating an end to the war.
- **Consumption:**
  - **Private Consumption:** Recovered strongly, adding 2.9% to GDP growth.
  - **Government Spending:** Fiscal impulse of 1.2% of GDP in 2023, with 7% of GDP on defense spending.

### World Bank Group Country Classifications by Income Level

The World Bank classifies economies into four income groups based on **Gross National Income (GNI) per capita**.

The four income groups are:

#### Low-Income Countries (LICs)

- **GNI per Capita:** \$1,135 or less.
- **Characteristics:** These countries often face significant challenges related to poverty, infrastructure, healthcare, and education. **Economic growth is typically slow, and they rely heavily on agriculture and basic industries.**

#### Lower-Middle-Income Countries (LMCs)

- **GNI per Capita:** \$1,136 to \$4,465.
- **Characteristics:** These countries are usually in a transitional phase, experiencing moderate economic growth. Industrialization is increasing, and **there are improvements in infrastructure and education, but challenges remain in addressing widespread poverty and inequality.**

#### Upper-Middle-Income Countries (UMCs)

- **GNI per Capita:** \$4,466 to \$13,845.
- **Characteristics:** These countries have more advanced industrial bases and diversified economies. They typically have better infrastructure, healthcare, and education systems, and a significant portion of their populations enjoys a higher standard of living. **However, disparities in wealth distribution can still be a concern.**

#### High-Income Countries (HICs)

- **GNI per Capita:** \$13,846 or more.
- **Characteristics:** These countries have **highly developed economies with strong industrial and service sectors.** They offer high standards of living, advanced infrastructure, comprehensive healthcare, and education systems. Economic growth is often stable, though some high-income countries may face challenges such as aging populations and maintaining economic competitiveness.

### Purpose and Utilization

- Policy Formulation and Aid Allocation:
- Comparative Analysis for economic performance and development progress

### Note Ban, GST, COVID Cost ₹11.3 Lakh Crore and 1.6 Crore Informal Jobs

#### Sub: Economy

#### Sec: National Income

#### Economic Impact Overview

- **Cumulative Economic Loss:** The cumulative impact of demonetization, GST rollout, and the COVID-19 pandemic is estimated at ₹11.3 lakh crore, equivalent to 4.3% of GDP in 2022-23, according to India Ratings and Research.

- **Affected Sector:** The informal sector has been severely impacted by these macroeconomic shocks.

#### Impact on Informal Sector

- **Shutdowns and Job Losses:** Between 2015-16 and 2022-23, 63 lakh informal enterprises shut down, resulting in the loss of approximately 1.6 crore jobs.
- **Gross-Value Added (GVA):** In FY23, GVA by unincorporated businesses was 1.6% below FY16 levels.
- **Growth Rate Decline:** The compounded annual growth rate (CAGR) for these enterprises was 7.4% between FY11 and FY16, but contracted by 0.2% since then.

#### Sectoral Data

- **Establishments and Employment:** Non-agricultural sector establishments rose to 6.5 crore in FY23 from 5.97 crore in FY22. Employment increased to 10.96 crore from 9.79 crore workers. However, this was lower than the 11.13 crore employed in FY16.
- **Manufacturing Jobs:** Declined to 3.06 crore in FY23 from 3.6 crore in FY16.

#### Real GVA of Unincorporated Firms

- **Manufacturing, Trade, and Other Services (MTO):** The real GVA was ₹9.51 lakh crore in FY23, contributing 18.2% to India's real MTO GVA, down from 25.7% in FY16.

#### Shrinkage in Informal Sector

- **Sectoral Shrinkage:**
  - **Other Services and Trade:** Informal sector share dropped to 32.3% and 21.2% in FY23 from 46.9% and 34.3% in FY16, respectively.
  - **Manufacturing:** Share fell to 10.2% from 12.5% during the same period.
- **Overall Contribution:** The unorganised sector contributes over 44% to India's GVA and employs almost 75% of the workforce in non-agricultural enterprises.

#### Unincorporated Sector Enterprises (USE) Growth

- **Size and Growth Rate:** The size of USE was ₹15.4 lakh crore in FY23, growing at a CAGR of 4.3% between FY16 and FY23, compared with a CAGR of 12.9% recorded between FY11 and FY16.

#### MSMEs Need Outlays for Technology Upgrades to Aid in Green Transition

##### Sub: Eco

##### Sec: National Income

**Union Minister for MSMEs** has identified **six pillars** crucial for the growth of the Micro, Small, and Medium Enterprises (MSME) sector:

- **Formalization and Access to Credit:** Ensuring MSMEs have access to necessary financial resources.
- **Increased Market Access and E-commerce Adoption:** Facilitating broader market reach through digital platforms.
- **Higher Productivity through Modern Technology:** Encouraging the adoption of advanced technologies.
- **Enhanced Skill Levels and Digitalization in the Service Sector:** Improving skills and digital capabilities.
- **Support to Khadi, Village, and Coir Industry:** Promoting traditional industries on a global scale.
- **Empowerment of Women and Artisans:** Fostering enterprise creation among these groups.

#### Budget Priorities

- The upcoming budget should balance growth, curb inflation, generate employment, support MSMEs, and promote the ease of doing business.
- Infrastructure development, particularly in industrial clusters, is critical for sustainable economic growth.

#### Export Growth and Employment

- Exports have grown with a CAGR of 8.5% over the past six years, from \$478 billion in FY18 to \$778 billion in FY24.
- The goal is to reach \$2 trillion in exports by FY30, requiring a CAGR of 14.4%.
- Supporting MSMEs is vital as they are key employment generators and crucial for sustaining and growing the economy.

#### Recommendations for MSMEs

- **NPA Timeline Extension:** Extend the NPA recognition period from 90 to 180 days to provide relief to struggling MSMEs.
- **Credit Guarantee Scheme Revamp:** Revise the scheme for micro and small enterprises in the manufacturing sector to better support these businesses.
- **Interest Equalisation Scheme:** Extend this **export-supporting scheme for five years.**

- **Sector-Specific Support:** Extend the **RoDTEP and RoSCTL** schemes for the textile and garment sector, predominantly MSMEs, for another five years.
- **Emergency Credit Line Guarantee Scheme:** Reintroduce this scheme for MSME exporters for another two years to support export activities.
- **Payment Timeline Extension:** Extend the payment timeline for MSME job work to 120 days from 45 days to ease fund flow issues.
- **PLI Scheme Adjustments:** Lower the investment limit to ₹25 crore and the turnover limit to ₹70 crore under the PLI scheme for the textile and garment sector to help MSMEs upgrade technology and compete internationally.

#### **Green Transition and R&D**

- **Climate Change Adaptation:**
- Allocate more soft funds for MSMEs to aid in green transition efforts and fuel growth with sustainable resources.
- **Research and Development:**
  - Increase the weighted tax deduction under Section 35(2AB) to 300%.
  - Extend R&D benefits under Section 35(2AB) to LLPs, partnership firms, and proprietary firms to encourage innovation within MSMEs.

#### **Scheme for Remission of Duties and Taxes on Exported Products (RoDTEP)**

The Scheme for Remission of Duties and Taxes on Exported Products (RoDTEP) is a key initiative aimed at supporting Indian exporters. It became operational on **January 1, 2021**, replacing the **Merchandise Exports from India Scheme (MEIS)** following a **World Trade Organization (WTO)** ruling that deemed MEIS non-compliant with WTO regulations due to its provision of export subsidies across a wide range of goods.

- **Objective:**
  - The primary objective of RoDTEP is to provide comprehensive support to exporters by remitting duties and taxes incurred during the production and distribution of exported products. It covers taxes, duties, and levies at central, state, and local levels that are not refunded through other mechanisms.
- **Rebate Mechanism:**
  - The rebate is based on a **percentage of the FOB (Freight On Board) value of exports**.
  - It is issued in the form of transferable duty credit/electronic scrip (e-scrip), with details maintained in a digital ledger by the Central Board of Indirect Taxes and Customs (CBIC).
- **Validity and Extension:**
  - Initially notified until September 30, 2023, the *RoDTEP scheme has been extended until June 30, 2024, with the same rates applicable to existing export items.*
- **Implementation and Management:**
  - The RoDTEP Committee operates within the **Department of Revenue** and is responsible for reviewing and recommending ceiling rates for different export sectors.
- **Financial Allocation:**
  - For the financial year 2023-24, the Indian Government has allocated Rs. 15,070 crores to support the RoDTEP scheme.
- **Stakeholder Engagement:**
  - The RoDTEP Committee engages with Export Promotion Councils (EPCs) and Chambers of Commerce to ensure the scheme meets the needs of exporters and addresses sector-specific concerns.

#### **Rebate of State and Central Taxes and Levies (RoSCTL) Scheme**

The Rebate of State and Central Taxes and Levies (RoSCTL) Scheme is **designed to reimburse all embedded State and Central Taxes/Levies for the export of manufactured goods and garments**. This scheme has succeeded the previous **Rebate of State Levies (RoSL) Scheme**, extending benefits to include both state and central taxes and levies.

- **Objective:**
  - To compensate for State and Central Taxes and Levies in **addition to the Duty Drawback Scheme on the export of apparel/garments and made-ups by providing a rebate**.
- **Rebate Form:**
  - The rebate under the scheme is provided in the form of duty credit scrips.
- **Issuance of Scrips:**
  - These scrips are issued electronically **through the Customs system**.
- **Usage of Scrips:**
  - Duty credit scrips can be used for the **payment of Basic Customs Duty on the import of goods**.



- These scrips are freely transferable.
- The duty credit available in an e-scrip must be transferred in its entirety at one time; partial transfers are not permitted.
- **Validity of E-Scrips:**
  - E-scrips are **valid for one year from their creation date**, and this period remains unchanged even if the e-scrip is transferred.

#### **Implementing Agency**

- The scheme has been **notified by the Ministry of Textiles**.
- It is **implemented by the Department of Revenue**.

#### **Industry to Offer Ideas to Ease Compliance Burden**

##### **Sub: Eco**

##### **Sec: National Income**

Union Commerce and Industry Minister addressed the FICCI National Executive Committee meeting emphasizing the *government's efforts to reduce the compliance burden on businesses and decriminalize laws to ease investment inflows*.

- **Jan Vishwas Law 2.0:**
  - The government is working on a **second iteration of the Jan Vishwas law** to further reduce compliance burdens and decriminalize laws.
  - The first iteration in 2023 **decriminalized 182 sections across laws governed by 18 central government departments**.
  - **Urging businesses to be more proactive and demanding in providing feedback and suggestions, to provide ideas on reducing the compliance burden and decriminalizing laws.**
  - Urged the industry to **share practical, result-oriented ideas** that can be implemented without compromising health, safety, or security.
  - He emphasized that the industry must provide a balanced view on necessary changes, suggesting how issues like fraud or misuse could be tackled through fines or other measures.
- **Foreign Direct Investment (FDI):**
  - Net inward FDI inflows declined to \$26.5 billion in 2023-24 from \$42 billion in 2022-23, according to the RBI's Annual Report for 2023-24.
  - Goyal's visit to Switzerland on July 14 aims to work towards **achieving the \$100 billion FDI goal under the India-EFTA Trade & Economic Partnership Agreement**.
- **Sector-Specific Example: Entertainment Industry:**
  - Goyal cited the entertainment industry, **which has significant potential, as an example of where easing licensing procedures could help**.
  - He proposed the idea of a **single portal to handle all approvals to counter harassment faced by industry players** for licenses and approvals.

#### **Jan Vishwas Act, 2023**

The Jan Vishwas (Amendment of Provisions) Act, 2023 *aims to enhance the business environment in India by reducing compliance burdens and removing the fear of imprisonment for minor offences, fostering trust-based governance*.

- **Decriminalization of Offences:**
  - Minor offences not involving harm to public interest or national security are decriminalized, replacing them with civil penalties or administrative actions.
  - 183 provisions across 42 Central Acts are decriminalized, **such as under the IT Act, 2000, where disclosing personal information in breach of a lawful contract** now attracts a penalty of up to ₹25 lakh instead of imprisonment.
- **Removal of Offences:**
  - Certain offences are fully removed, including all offences under the Indian Post Office Act, 1898.
- **Periodic Revision of Penalties:**
  - Fines and penalties will increase by 10% of the minimum amount every three years.
- **Adjudicating Officers:**
  - The government may **appoint one or more adjudicating officers to determine penalties** through an adjudication mechanism, imposing monetary penalties.
- **Appellate Mechanisms:**

- An appellate mechanism is **introduced for grievance redressal regarding decisions made by adjudicating officers.**

## SJM Seeks 'Robot Tax' for AI-Induced Job Loss

**Sub : Eco**

**Sec: National Income**

The Swadeshi Jagran Manch (SJM), affiliated with the Rashtriya Swayamsevak Sangh (RSS), has *proposed a 'robot tax' to mitigate job losses caused by the adoption of Artificial Intelligence (AI).*

- **Robot Tax:**
  - **Purpose:** To cross-subsidize employees who lose jobs due to AI adoption.
  - **Usage:** The tax proceeds would *create a fund to help displaced workers upskill and adapt to new technologies.*
  - **Rationale:** While not opposing AI and cutting-edge technology, *acknowledges the short-term job displacement caused by such technologies* and seeks economic measures to address the human cost.
- **Incentives for Job Creation:**
  - **Proposal:** Tax incentives for industries generating more employment, assessed based on an employment-output ratio.
  - **Objective:** To encourage industries to create more jobs, addressing the unemployment concerns highlighted during the recent Lok Sabha election campaign.
- **Subsidies for Small Farmers:**
  - **Proposal:** Subsidies for micro-irrigation projects to boost productivity on small farms.
  - **Objective:** To combat food inflation by increasing agricultural productivity.
- **Wealth Tax on Vacant Land:**
  - **Proposal:** Imposition of a wealth tax on individuals holding vacant land.
  - **Objective:** To discourage unnecessary land holding and address housing shortages by making more land available for development.

### Context and Justification

- **Economic Measures for AI Impact:** Need for economic measures to cope with AI-induced job losses, highlighting the importance of upskilling workers to adapt to technological changes.
- **Job Creation and Unemployment:** Aim to stimulate job creation through fiscal incentives and support for labour-intensive industries.
- **Food Inflation:** By providing subsidies for micro-irrigation, the proposal seeks to support small farmers and enhance food production, thereby stabilizing food prices.
- **Housing for All:** The proposed wealth tax on vacant land is *intended to make land available for housing projects, contributing to the government's goal of housing for all.*

### Robot Tax: An Overview

The concept of a robot tax emerged in response to the **increasing automation driven by advanced robotics and artificial intelligence (AI).** This wave of automation is expected to **replace a significant portion of human labor, potentially leading to widespread job displacement and economic disruption.**

A robot tax is a proposed tax on companies that use robots and AI to replace human workers. **The idea is to generate revenue that can be used to mitigate the negative impacts of automation on the workforce and the broader economy.**

### Rationale Behind the Robot Tax

- **Income Displacement:**
  - Automation can lead to job losses, reducing the income of individuals who are replaced by robots.
  - *Consequently, governments may lose income tax revenue from these individuals.*
- **Fiscal Necessity:**
  - A robot tax can provide governments with the necessary funds to support social programs, such as welfare for the elderly, education, and retraining programs for displaced workers.

## Deregulating Non-Subsidised Fertilisers

**Sub: Economy**

**Sec: National Income**

Urea, a crucial fertiliser, has had its maximum retail price (MRP) fixed since 2012 and is unlikely to be decontrolled or see a price hike soon.

Similarly, other non-urea fertilisers under the nutrient-based subsidy (NBS) regime, though technically decontrolled, face informal price controls.

## Why Deregulate Non-Subsidised Fertilisers?

- **Expand the Market:**
  - Deregulating non-subsidised fertilisers can help expand the market for innovative and high-efficiency fertiliser products.
- **Reduce Bureaucratic Delays:**
  - The registration process for **new fertiliser products in India is lengthy, taking an average of 804 days.** Deregulation could streamline this process and make it easier for new products to enter the market.
- **Encourage Innovation:**
  - By reducing regulatory barriers, companies can introduce new nutrient products more quickly, providing farmers access to advanced fertilisers used in other countries.

## Case for Deregulation

- **Current Fertiliser Sales:**
  - The majority of fertiliser sales are dominated by a few products, **with 94% of overall sales in 2022-23 and 2023-24 comprising seven main fertilisers, including urea and DAP.**
- **Precedent in Water-Soluble Fertilisers (WSF):**
  - The government has already implemented a deregulation model for WSFs. **These fertilisers, which are 100% soluble in water, can be applied through drip irrigation or spraying and are subject to automatic registration** if they meet basic quality standards and labeling requirements.
- **Potential Benefits of Deregulation:**
  - **Increased Access to Innovative Products:** Farmers could access the latest fertiliser technologies without waiting for prolonged registration processes.
  - **Higher Nutrient Absorption:** WSFs and liquid fertilisers offer higher nutrient use efficiency compared to traditional bulk fertilisers, improving crop yield and quality.
  - **Cost Efficiency:** While WSFs are more expensive, their higher nutrient absorption rates make them more cost-effective in the long run.

## Implementation Challenges

- **Quality Control:**
  - Ensuring that deregulated fertilisers meet minimum nutrient content and maximum contaminant limits is crucial. This requires robust enforcement mechanisms.
- **Market Dynamics:**
  - Deregulation may affect the prices and availability of subsidised fertilisers, which could have implications for small and marginal farmers reliant on these subsidies.

## About the PM-PRANAM Scheme (PM Programme for Restoration, Awareness, Generation, Nourishment, and Amelioration of Mother Earth) scheme

The main objective of the PM-PRANAM scheme is to **reduce the use of chemical fertilizers by incentivizing states to adopt alternative fertilizers, thus encouraging a balanced use of fertilizers in conjunction with bio-fertilizers and organic fertilizers.**

- **Incentives for States:**
  - States that adopt alternative fertilizers will be **incentivized with the subsidy saved by reducing the use of chemical fertilizers.**
  - Half of the subsidy savings will be passed on to the state that saves the money as a grant.
- **Utilization of Grants:**
  - **70% of the grant** can be used to create assets related to the technological adoption of alternate fertilizers and alternate fertilizer production units at the village, block, and district levels.
  - **30% of the grant** can be used to reward and encourage farmers, panchayats, and other stakeholders involved in fertilizer reduction and awareness generation.
- **Evaluation Mechanism:**
  - The government will evaluate the utilization of fertilizers in terms of increase or decrease in overall consumption in a year vis-a-vis consumption over the past three years.
  - The **Integrated Fertilizers Management System (iFMS) will be the platform used to track the use of fertilizers.**

## Funding Mechanism:

- The PM-PRANAM scheme will not have a separate budget.

- It will be **financed by the savings from existing fertilizer subsidies under current schemes.**
- The scheme ensures that the **saved subsidies are used effectively to promote the adoption of alternative fertilizers.**

The PM-PRANAM scheme is a significant initiative aimed at promoting sustainable agriculture by **reducing the reliance on chemical fertilizers and encouraging the use of bio-fertilizers and organic fertilizers.**

### The Problem with Billionaire Consumption

**Sub: Eco**

**Sec: National Income**

**Introduction:**

- The lavish wedding celebrations of billionaire Mukesh Ambani's youngest son highlight the issue of **conspicuous consumption** by the rich.
- This raises questions about the impact of such private wealth displays in a society with high inequality.

**Perspectives on Billionaire Consumption:**

**A. Right-Wing View:**

- **Billionaire consumption is seen as a legitimate exercise of private freedom** in a liberal capitalist democracy.
- Inequality is viewed as a result of flawed policies rather than the fault of billionaires.
- **Market access** is believed to ensure adequate wealth distribution for all.

**B. Left-Wing (Marxist) View:**

- **Profits are viewed as unfair extraction of value** since value is created solely by labor.
- **Billionaire consumption is seen as illegitimate**, as it represents a denial of workers' rightful claims.
- **Structural imbalances** in capitalism continually enrich a few at the expense of many.

**Economic Impact of Billionaire Consumption:**

**A. Positive Economic Impact:**

- **Domestic consumption by billionaires can increase demand for locally-made goods**, boosting domestic employment and incomes.
- In economies with employment concerns, **rich individuals' private consumption can boost aggregate demand.**

**B. Investment vs. Consumption:**

- **Long-term growth depends on investment rather than consumption.**
- Example: Buying clothes (consumption) vs. buying sewing machines (investment) — the latter increases labour productivity and per capita incomes.
- **Investment spending increases demand in both the investment and consumption sectors.**

**The Keynesian Perspective:**

- **Capitalist societies operate on a social contract**, allowing wealth control and production provided capitalists ensure high levels of investment.
- **Investment drives economic welfare**; the rate of growth is highest when profits are entirely invested.
- **Conspicuous consumption reduces resources available for investment**, thus reducing welfare.

**Modern Capitalism's Peculiar Problems:**

- **Profits are accrued privately, and investment decisions are taken privately.**
- Capitalists may choose not to invest due to risks or may engage in lavish consumption.
- **Workers lack control over investments**, affecting their employment and living standards.
- **Monopoly prices further reduce real wages and purchasing power** for workers.

**Conclusion:**

- The purpose is not to criticize specific instances of conspicuous consumption but to highlight broader economic issues.
- **Keynesian view:** Lavish consumption is problematic if it leads to insufficient investment and high monopoly prices.
- The stark inequalities, youth unemployment, stagnant real wages, and job losses in the informal sector present significant public policy challenges.

**Keynesian Economics**

Named after British economist John Maynard Keynes, **Keynesian economics is a theory that emphasizes the role of government intervention in stabilizing the economy.** Keynesianism gained prominence during the Great Depression of the 1930s.

**Core Principles:**

**Aggregate Demand:** Keynesian economics asserts that **aggregate demand (total spending in the economy) is the primary driver of economic activity and employment.**

**Government Intervention:** It advocates for **active government intervention to manage economic cycles.** This includes fiscal policies (government spending and tax policies) to influence demand.

**Short-Run Focus:** Keynesians believe that in the short run, **economic output is influenced by demand, and that economies can be below full employment for extended periods.**

**Key Concepts:**

**Fiscal Policy:** Use of government spending and taxation to influence the economy. **During a recession, Keynesians advocate for increased government spending and/or tax cuts to boost demand.**

**Multiplier Effect:** The idea that an **initial amount of spending (usually by the government) leads to increased consumption and thus greater total economic output.**

**Liquidity Preference:** The preference for **holding cash rather than investing in uncertain assets,** particularly during times of economic uncertainty.

**Marginal Propensity to Consume (MPC):** The proportion of additional income that a consumer will spend rather than save. **High MPC suggests that fiscal policy will be more effective.**

**Economic Policies:**

**Counter-Cyclical Policies:** To counteract economic fluctuations, Keynesians recommend expansionary fiscal policy during recessions and contractionary policy during booms.

**Deficit Spending:** Keynesians argue that during economic downturns, governments should run budget deficits to stimulate demand and reduce unemployment.

**Public Works Programs:** Investment in infrastructure and public projects to create jobs and spur economic activity.

**Criticisms:**

**Long-Term Debt:** Critics argue that persistent government intervention and deficit spending can lead to high levels of public debt and long-term economic issues.

**Inflation:** Excessive government spending can lead to inflation if the economy is at or near full capacity.

**Crowding Out:** Increased government borrowing may lead to higher interest rates, potentially crowding out private investment.

**Poor performance of India's most populated states to end hunger & empower women slows down national, global SDG progress**

**Sub: Economy**

**Sec: National Income**

**Context:**

- **India** has performed the worst on **SDG 2 (Zero Hunger)** and **SDG 5 (Gender Equality)** among the **15 Sustainable Development Goals (SDGs) monitored,** according to NITI Aayog's **SDG Index, 2023-24.**
- **SDG 14 (Life Below Water)** and **SDG 17 (Partnerships for the Goals)** were not included in the ranking criteria, as **SDG 14 applies only to coastal states.**



**SDG 5: Gender Equality:**

- The **national average score for SDG 5 is the lowest at 49 out of 100.**
- **13 states and one Union Territory** scored below the national average, including **Odisha, Uttar Pradesh, Jharkhand, Bihar, and West Bengal.**



- **Odisha** performed the **worst** with a score of **39**, particularly struggling with the **female-to-male wage ratio** at **0.56**, followed by **Jharkhand (0.6)**.

#### SDG 2: Zero Hunger:

- The **national average score** for **SDG 2** is the **second lowest** at **52** out of **100**.
- **10 states and one Union Territory** scored **below the national average**.
  - **These include:** Odisha, Dadra & Nagar Haveli and Daman and Diu, Assam, Uttar Pradesh, Jharkhand, Bihar, Manipur, West Bengal, Tripura, Haryana, Punjab, Madhya Pradesh, Chandigarh and Telangana.
- **Bihar** scored the **lowest at 24**, followed by **Jharkhand at 28**.
- **Bihar's performance** was notably **poor**, with **42.9% of children under five** being stunted against a **national target of 23.7%**.

#### State Performance Analysis:

- **Uttar Pradesh, Bihar, and Madhya Pradesh**, some of India's largest states by population, performed **poorly** on both **SDG 2 and SDG 5**.
- **Bihar**, despite improvements from a score of **32 in 2020-21** to **57 in 2023-24**, remained the **poorest performer**, lagging in **five SDGs** including **SDG 2 and SDG 5**.

Indicator (under SDG 2)	India's target	India's performance	Bihar's performance
Percentage of children (under 5 years) who are underweight	13.3	37.1	41
Percentage of children (under 5 years) who are stunted	23.7	35.5	42.9
Percentage of pregnant women (15-49 years) who are anaemic	25.2	52.2	63.1

#### Global Perspective:

- **India's global rank** improved to **109** out of **166 countries**, yet the country still faces major challenges under **SDG 2 and SDG 5**.
- The **Sustainable Development Report 2024** indicated **India's progress on ending hunger has stagnated**, despite dismissing the findings of the **Global Hunger Index**, which reported the **highest child wasting rate**.

#### SDG India Index:

- The **SDG India Index** is a tool developed by **NITI Aayog** to **measure and track India's progress** towards the **SDGs** set by the **United Nations**.
- The **Index** supports the **localisation of SDGs**, encouraging states to integrate these goals into their development plans.
- It serves as a benchmark for policymakers to identify gaps and prioritise actions towards achieving **sustainable development by 2030**.
- **Methodology:** The Index assesses the performance of states and union territories (UTs) across **16 SDGs** using a set of indicators aligned with national priorities.
- The **SDG India Index** measures **national progress** using **113 indicators** aligned to the **National Indicator Framework**.
- **Goal-wise scores** are computed for the **16 SDGs**, and overall composite scores are derived for each **State/UT**. **Goal 14 (Life Below Water)** has not been included in the calculation of the **Composite Score** for the Index as it solely pertains to the nine coastal States.
- Scores range from **0-100**, with **higher scores** indicating **greater progress** toward **SDG targets**.
- **State/UTs** are categorised based on their **SDG India Index** score as follows: **Aspirant: 0-49**, **Performer: 50-64**, **Front-Runner: 65-99**, and **Achiever: 100**.

#### What is the economic survey

##### Sub: Eco

##### Sec: National Income

The Economic Survey is a detailed annual document prepared by the Economic Division of the **Department of Economic Affairs in the Ministry of Finance**. It is formulated under the supervision of the **Chief Economic Advisor** (V Anantha Nageswaran is the current CEA of India) and provides a statistical and analytical overview of the economy.

The survey covers a range of topics, including GDP growth, inflation, employment, sectoral performance, and budget deficits. Its primary purpose is to inform policymakers, businesses, and the public about the economic conditions and the challenges ahead.

The first Economic Survey was introduced in **1950-51** and was initially part of the budget documents. In the 1960s, it was separated from the budget and presented a day before the Union Budget. Over the years, the survey has evolved to include various themes that reflect the country's economic priorities.



## Economic Survey 2023-24 key takeaways

### Sub: Eco

#### Sec: National Income

#### The key takeaways of Economic Survey 2023-24

##### Economic Growth

- The survey projects a **real GDP growth rate** for the current financial year (FY 2024-25) between **6.5% and 7%**, **slightly lower than the 8.2 per cent growth** estimated for the previous financial year.
- Domestic growth drivers supported economic growth in FY24 despite uncertain global economic performance.
- To sustain post-pandemic recovery, there has to be heavy lifting on the domestic front.

##### Inflation

- While the **overall headline inflation rate** is largely under control, specific food items have seen elevated prices.
- The survey projects the inflation rate to be 4.5 per cent in FY25 and 4.1 per cent in FY26.

##### Government Policy

- India's policy adeptly steered through challenges, ensuring price stability despite global uncertainties.
- Tax compliance gains, expenditure restraint, and digitisation helped India achieve fine balance in govt's fiscal management.
- Reaching agreements on key global issues like trade, investment, and climate has become extraordinarily difficult.

##### Agriculture

- The survey describes agriculture as **“one area ripe for and in need of a pan-India dialogue”**.
- **Smallholder farmers** need to shift from **traditional crops to high-value agriculture**, including fruits, vegetables, fisheries, poultry, dairy, and meat.
- This shift is seen as essential for **increasing farmers' incomes** and spurring a manufacturing revolution, similar to what China experienced between 1978 and 1984 when the real incomes of farmers doubled in just six years.
- The survey also highlights the growing significance of allied sectors such as animal husbandry, dairying, and fisheries in enhancing farmers' incomes.
- The performance of the agriculture sector has been growing at an average rate of 4.18% over the last five years

##### Financial Sector

- Outlook for **India's financial sector appears bright**.
- Improved balance sheets in the private sector will strengthen private investment.
- However, Private capital formation may turn more cautious due to fears of cheaper imports from countries that have excess capacity.
- Capital markets becoming prominent in India's growth story; market resilient to global geopolitical, economic shocks.

##### Private sector

- The survey advocates for a tripartite compact involving the central government, state governments, and the private sector to achieve the higher aspirations of Indians and complete the journey to a developed India by 2047.
- “Job creation happens mainly in the private sector. Many issues influencing economic growth, job creation, and productivity are in the domain of state governments.”
- As much as 54 per cent of disease burden due to unhealthy diets; need transition towards balanced, diverse diet. The survey suggests that embracing traditional practices can help the private sector lead in the global market.

##### Retail investment

- The Economic Survey highlights the significant increase in **retail investors in the stock market, calling for careful consideration to avoid overconfidence and speculation**.
- It warns against the **over-financialization of the economy**, which has historically led to crises in developing countries.

##### Remittances

- Remittances to India to grow at **3.7 per cent to \$124 billion in 2024, 4 per cent in 2025 to reach \$129 billion**.

##### China Challenge

- India continues to be **overly dependent on China for imports**, especially for **renewable energy**.
- China has not let go of the **low-skills manufacturing space** that India wanted to occupy.

##### AI threat

- The Survey notes that while there has been a **boom in telecommunications** and **Internet facilitated business process outsourcing (BPO)**, the next wave of technological evolution might bring the curtains down on it.

### Employment:

- The Indian economy needs to generate an average of **nearly 78.5 lakh jobs annually until 2030 in the non-farm sector to cater to the rising workforce.**

### Regulatory bottlenecks

- The Licensing, Inspection and Compliance requirements that all levels of the government continue to impose on businesses is an onerous burden.
- MSME is one sector that needs to be relieved of regulatory burden the most.

### Building state capacity

- What is needed in the economy now is not big reforms but the grunt work.
- To this end it advocated building up state capacity for sustaining and accelerating India's progress.

### China Plus One strategy

- The Economic Survey suggests that India can benefit from the **China Plus One strategy by integrating into China's supply chain or promoting Chinese foreign direct investment (FDI).**
- This strategy would help India reduce its trade deficit with China and boost its exports to advanced economies.

### About China-plus one strategy

- China Plus One, also known simply as Plus One, is the **business strategy to avoid investing only in China and diversify business into other countries.**
- It was coined in 2013 as a global business strategy.
- Many overseas companies once moved operations to China due to the low cost of labor, but companies are now reevaluating their setup in this country and diversifying their manufacturing strategies.
- The driving factors range from **China's cost advantage diminishing in recent years to growing geopolitical distrust between China and the West.**

### Need for sustainable reforms

- Focus on **sustainable and inclusive growth** is essential for addressing the challenges of **job creation, productivity improvement, and economic growth.**
- "Big-ticket reforms have been initiated and done. The Government's focus must turn to bottom-up reform and the strengthening of the plumbing of governance."

### Finance Minister Nirmala Sitharaman will present the first Budget of the third successive government under the leadership of Prime Minister Narendra Modi

#### Subject: Economy

#### Sec: National Income

#### Context:

- Budget presentation is **typically a quinquennial event in India.**
- Once **every five years**, the **Union Budget is presented twice** — first as an **interim budget** (in February) by the outgoing government and then as a full budget by the newly-formed government.
- Sitharaman had presented an **interim Budget for the current financial year (2024-25) on February 1.**

#### What is the Budget?

- An exercise where the government tells the Parliament (and through it, the whole country) about the health of its **finances.**
- This means coming clean on **three main things:**
  - **Income**
  - **Expenditure**
  - **Borrowing**
- Typically comes at the **end of one financial year and the start of another.**
- **Essentially discusses the citizen's money. The government's borrowing (the fiscal deficit) is, in no uncertain terms, an addition to a debt that citizens and their future generations will have to pay back.**

#### Why does it matter?

- The fact is that there is no such thing as government money — it is all **taxpayer's money. Conservative British Prime Minister Margaret Thatcher** once explained in the **House of Commons of the UK:**
- **"The state (government) has no source of money other than the money people earn themselves. If the state (government) wishes to spend more, it can do so only by borrowing your savings or by taxing you more. It is no good thinking that someone else will pay. That someone else is you."**

### Union Budget influence the economy:

- **One is by tweaking who it taxes and how much.**
- If a government **wants to incentivise businesses in one segment of the economy** — presumably because it believes such a move will leverage India's demographic profile, create jobs and bring prosperity — **it can lower the tax rate.**
- **Lowering the tax rate may not necessarily lead to lower revenues;** it is quite possible that the **increased economic activity (thanks to the lower tax rate) leads to higher overall revenues despite a lower tax rate.**
- **Second is by tweaking where a government spends and how much.** While the **budget is only for a year, budgets at the start of a new government's term (as is the case this time) can often signal a broader shift in how the government wants to spend its money.**
- The **biggest macroeconomic policy shift of the last government (2019-2024) was the focus on incentivising investments by the private sector.**

### Interim Budget:

- An Interim Budget is presented by a government that is going through a transition period or is in its **last year in office ahead of general elections.**
- The purpose of the interim budget is to **ensure the continuity of government expenditure and essential services** until the new government can present a **full-fledged budget** after taking office.

### Union Budget:

- According to **Article 112 of the Indian Constitution, the Union Budget of a year, also referred to as the annual financial statement, is a statement of the estimated receipts and expenditure of the government for that particular year.**

### Terms related to budget

#### Budget and Revised Estimate

- **Budget Estimates** represent the idea of upcoming government projects and their progression. The revised Estimate explains the expenses that are going to happen.
- Budget estimates work like a critical process and show the transparency work and budget fund of the government. The budget estimates session committee asks every finance minister and public services about their action decisions and advice for upcoming projects for public benefit.
- **Revised estimates** only get sanction permission if the previous original sanctioned estimates go more than 5% due to material quality matter and rates. It also covers the fact of material quantity.
- It is an evaluation that is presented in the middle of the year.

#### Deficits in the budget

- **Fiscal deficit** by definition is the difference between total expenditure and the sum of revenue receipts and non-debt receipts. It indicates how much the Government is spending in net terms.
- Since positive fiscal deficits indicate the amount of expenditure over and above revenue and non-debt receipts, it needs to be financed by a debt-creating capital receipt.
- **Primary deficit** is the difference between fiscal deficit and interest payments.
- **Revenue deficit** is derived by deducting capital expenditure from fiscal deficits.

#### FRBM Act and amendment

- It was enacted in August 2003.
- It aims to make the Central government responsible for ensuring inter-generational equity in fiscal management and long-term macro-economic stability.
- The Act envisages the setting of limits on the Central government's debt and deficits.
- It limited the fiscal deficit to 3% of the GDP and mandates that the revenue deficit should be brought down to zero.
- To ensure that the States too are financially prudent, the 12th Finance Commission's recommendations in 2004 linked debt relief to States with their enactment of similar laws.
- The States have since enacted their own respective Financial Responsibility Legislation, which sets the same 3% of Gross State Domestic Product (GSDP) cap on their annual budget deficits.
- It also mandates greater transparency in fiscal operations of the Central government and the conduct of fiscal policy in a medium-term framework.
- The Budget of the Union government includes a Medium Term Fiscal Policy Statement that specifies the annual revenue and fiscal deficit goals over a three-year horizon.
- The rules for implementing the Act were notified in July 2004.

### Amendment in 2018

- The rules were amended in 2018, and most recently to the setting of a target of 3.1% for March 2023.
- The NK Singh committee (set up in 2016) recommended that the government should target a fiscal deficit of 3% of the GDP in years up to March 31, 2020 cut it to 2.8% in 2020-21 and to 2.5% by 2023.

### Expenditure

- **Capital expenditure:**
  - Capital expenditure is incurred with the purpose of increasing assets of a durable nature or of reducing recurring liabilities.
  - Consider the expenditure incurred for constructing new schools or new hospitals. All these are classified as capital expenditure as they lead to creation of new assets.
- **Revenue expenditure:**
  - Revenue expenditure involves any expenditure that does not add to assets or reduce liabilities.
  - Expenditure on the payment of wages and salaries, subsidies or interest payments would be typically classified as revenue expenditure.

### Receipts

- The receipts of the Government have three components —**revenue receipts, non-debt capital receipts and debt-creating capital receipts.**
- **Revenue receipts** involve receipts that are not associated with increase in liabilities and comprise revenue from **taxes and non-tax sources.**
- **Non-debt receipts** are part of capital receipts that do not generate additional liabilities. Recovery of loans and proceeds from disinvestments would be regarded as non-debt receipts since generating revenue from these sources does not directly increase liabilities, or future payment commitments.
- **Debt-creating capital receipts** are ones that involve higher liabilities and future payment commitments of the Government.

### Centre to amend rules on mandatory declaration of product details on bulk retail packets

**Subject: Economy**

**Sec: Msc**

**Context:**

The Rules mandate declaration of name and address of the manufacturer/ packer/ importer, country of origin, common or generic name of the commodity, etc. on all pre-packaged commodities.

More About News:

- The **Department of Consumer Affairs** has decided to amend the Legal Metrology (Packaged Commodities) Rules, 2011 to ensure mandatory declaration of all information on pre-packaged commodities used for retail sale.
- Department of Consumer Affairs, administers the Legal Metrology Act 2009. The act provides for application of legal requirements to measurements and measuring instruments.
- The objective of Legal Metrology is to ensure public guarantee from the point of view of security and accuracy of the weighments and measurements.
- The Legal Metrology (Packaged Commodities), Rules 2011 are primarily intended to ensure that the consumers are able to make informed choices by being informed of essential declarations on the pre-packed commodities.

**Why amendment?**

- The decision comes in the wake of information that the packaged commodities above **25 kg are available** in the market for retail sale without mandatory declarations on the packages.
- The rules, however, are not applicable to the packaged commodities meant for industrial consumers or institutional consumers.
- This revised provision will help in establishing uniform standards/ requirements for packaged commodities, promoting consistency and fairness across different brands and products and will help consumers in making informed choices based on complete information.
- The Legal Metrology (Packaged Commodities) Rules, 2011 mandate declaration of information such as name and address of the manufacturer/ packer/ importer, country of origin, common or generic name of the commodity, net quantity, month and year of manufacture, maximum retail price, unit sale price, best before/ use by date, consumer care details etc. on all pre-packaged commodities in the interest of consumers.

**Legal Meterology:**

Legal Metrology treats units of weight and measurement, methods of weight and measurement and weighing and measuring instruments, in relation to the mandatory technical and legal requirements which have the object of ensuring public guarantee from the point of view of security and accuracy of the weightings and measurements.

**The Rules are applicable on all pre-packaged commodities except the following:**

- (a) packages of commodities containing quantity of more than 25 kilogram or 25 litre
- (b) cement, fertilizer and agricultural farm produce sold in bags above 50 kilograms
- (c) packaged commodities meant for industrial consumers or institutional consumers.

## Environment

### Should India focus on natural farming?

**Sub: Env**

**Sec: Agri**

**Context:**

- Union Finance Minister Nirmala Sitharaman announced plans to **involve one crore farmers in natural farming** over the next two years, supported by **certification and branding**.
- Implementation will involve **scientific institutions** and **gram panchayats**, with **10,000 bio-input resource centres to be established**.

**National Mission on Natural Farming (NMNF):**

- NMNF aims to encourage farmers to **adopt chemical-free farming** using **locally-produced, cow-based inputs**.
- The **natural farming scheme**, under the **‘Bharatiya Prakritik Krishi Paddhati,’** has a budget of **₹4,645.69 crore** for six years (2019-20 to 2024-25).

**What is Natural Farming?**

- **Natural farming** avoids **chemical fertilizers** and **pesticides**, using **traditional practices** like **biomass recycling, cow dung-urine formulations, and on-farm botanical concoctions**.
- It focuses on **natural nutrient cycling** and **increasing soil organic matter, integrating crops, trees, and livestock**.



**Natural farming practice:**

- Natural farming is an ecological farming approach where farming system works with the natural biodiversity, encouraging the soil's biological activity and managing the complexity of living organisms both plant and animal to thrive along with food production system. Important practices, essential for adoption of natural farming includes:
  - No external inputs,
  - Local seeds (use of local varieties), .
  - On-farm produced microbial formulation for seed treatment (such as bijamrita),
  - On-farm made microbial inoculants (Jivamrita) for soil enrichment,
  - Cover crops and mulching with green and dry organic matter for nutrient recycling and for creating a suitable micro-climate for maximum beneficial microbial activity in soil.
  - Mixed cropping,
  - Managing diversity on farm through integration of trees
  - Management of pests through diversity and local on-farm made botanical concoctions (such as neemstra, agniastra, neem ark, dashparni ark etc);
  - Integration of livestock, especially of native breed for cow dung and cow urine as essential inputs for several practices and

- Water and moisture conservation.

#### AIMS AND OBJECTIVES FOR NATURAL FARMING PROMOTION:

- Preserve natural flora and fauna
- Restore soil health and fertility and soil's biological life
- Maintain diversity in crop production
- Efficient utilization of land and natural resources (light, air, water)
- Promote natural beneficial insects, animals and microbes in soil for nutrient recycling and biological control of pests and diseases
- Promotion of local breeds for livestock integration
- Use of natural / local resource-based inputs
- Reduce input cost of agricultural production
- Improve economics of farmers

#### Challenges and Concerns:

- Experts express concerns about **transitioning from chemical to natural farming** on a large scale in **India**, given the **country's food security needs**.
- An academic paper highlights mixed outcomes from different studies on **Zero Budget Natural Farming (ZBNF)**, with **Andhra Pradesh** showing **positive results**, while another study notes **significant yield declines in key crops like wheat and basmati rice**.
- **Sri Lanka's complete shift to organic farming** led to **economic and political turmoil**, highlighting the **risks of a sudden transition without adequate preparation and study**.

#### What is a People's Biodiversity Register?

**Sub : Environment**

**Sec: Biodiversity**

**Context:**

- In April 2024, **Bengaluru's Biodiversity Management Committee (BMC)** decided to record a **century-old woodland** near **Manyata Tech Park** in the city's **People's Biodiversity Register (PBR)**.
- The **woodland** hosts over **20 tree species** and various **bird species**, and documenting such areas in the **PBR** is crucial for **conservation** and **traditional knowledge** sharing amidst **rapid urbanization**.

#### What is a People's Biodiversity Register?

- The **People's Biodiversity Register (PBR)** is a **repository of flora and fauna, local livelihoods, and traditional knowledge** under the **Biological Diversity (BD) Act, 2002**.
- **PBRs** serve as informal inventories and databases, protecting intellectual property rights and supporting conservation efforts.
- Local communities, BMC members, students, teachers, and volunteers contribute to documenting local biodiversity.
- **National Biodiversity Authority (NBA)** is a **statutory body** established to carry out the provisions of the **Biodiversity Act 2002**.

#### How has PBR Raised Awareness of Biodiversity?

- **PBRs aim to conserve biological diversity, ensure sustainable use of resources, and equitably share benefits from biological knowledge**.
- They document indigenous knowledge to prevent **biopiracy** and **support local ownership claims**.
- **Examples** include villagers in **Udupi** realizing the **economic value of non-timber forest produce** and **conservation efforts** for **Bengaluru's Madiwala Lake**.

#### How Can PBR be Employed to Uplift Economies?

- **PBRs** can serve as **legal evidence** of **traditional knowledge** and help uplift **Indigenous communities**, though practical implementation remains limited.
- For instance, **medicinal plant knowledge** in **Tamil Nadu** has not resulted in **economic benefits for local residents**.
- The **Access and Benefit Sharing (ABS) mechanism** mandates sharing profits from traditional knowledge with local communities, but implementation has been inconsistent.

#### New study puts spotlight on neglected mammal, bird pollinators

**Sub : Environment**

**Sec: Biodiversity**



### Context:

- New research reveals that **mammal and bird pollinators in India** face significant threats, with **hotspots** and **extinction risks** identified.

### Details:

- **Mammal pollinator hotspots** are in the **south** of the **Western Ghats** (**Kollam** and **Pathanamthitta** in **Kerala** and **Kanyakumari** in **Tamil Nadu**), while **bird pollinator diversity** is **more widespread**.
- An analysis of the hotspots of threatened **vertebrate pollinator species**- based on the **IUCN Red List of conservation status of plants, animals and other organisms**- shows that **only mammal pollinators** such as certain **bats, monkeys and squirrels** are currently classified as **threatened** in **India**.
- The study found multiple hotspots of population declines for birds and mammal pollinators mainly in the south of Western Ghats.

### Threats to Pollinators:

- **Human activities** such as **agriculture, logging, and hunting** pose **major threats** to pollinators.
- These threats have **ecological and economic consequences**, including **reduced food production, plant extinction, and economic damage**.
- The study emphasizes the need for **vertebrate pollinators' protection** in **conservation agendas**.

### Importance of Bats and Mammal Pollinators:

- **Bats** are highlighted as **vital and economically important pollinators**, with their decline due to **inadequate protection**.
- **Fruit-bat species** (For example- the **Indian flying fox**, the **greater short-nosed fruit bat**, and **Leschenault's rousett**) are crucial for **pollinating** and **seed-dispersing economically important plants**.
  - **Indian giant squirrel *Ratufa indica*** and the **jungle palm squirrel *Funambulus tristriatus*** in **India** are **endemic** to the **Western Ghats**.
- Of the **13 fruit-bat species of India**, all but ***Latidens salimalii*** or **Salim Ali's fruit-bat**, considered **one of the three rarest bats in the world**, are listed as **pests or vermin** under the **Indian Wildlife Protection Act 1972**.
- **Mammal pollinator species endemic to the Western Ghats**, like the **Indian giant squirrel**, face **habitat destruction and harvesting pressures**.

### Pollinator-Friendly Conservation Methods:

- The study highlights gaps in **pollinator distribution**, indicating **habitat fragmentation** and its **ecological implications**.
- It suggests **implementing conservation methods** such as **establishing pollinator corridors** and **planting pollinator-friendly plants**.
- These practices are common in **Europe** but **not yet widely implemented in India**.

### Significance of the Study:

- This study is the **first comprehensive analysis** of the **species richness and extinction risk of bird and mammal pollinators in India**.
- It fills a knowledge gap, as prior research focused primarily on **insect pollinators**.
- The study reinforces the need for prompt conservation actions for vertebrate pollinators due to their significant ecosystem and agricultural impacts.

## Central India's land-use patterns, roads fragmenting gaur & sambar populations, threatening genetic diversity

**Sub: Env**

**Sec: Biodiversity**

### Context:

- **Land use patterns** and **roads** in **central India** are **disrupting the genetic connectivity of Gaur and Sambar**.
- The study by the **National Centre for Biological Sciences (NCBS)** indicated **high genetic differentiation**, suggesting **small populations with little gene flow**.

### Study and Findings:

- Researchers collected samples from tiger reserves and wildlife sanctuaries in **Madhya Pradesh** and
- Using **next-generation sequencing (NGS)** and **genetic tools**, they identified **921 samples as gaur** and **504 samples as sambar**.
- The study found that **gaur was most impacted by land-use changes, roads, and dense infrastructure**, showing **low genetic diversity**.
- **Sambar**, also affected by **human presence**, showed **less differentiation** but had **low genetic diversity**, likely due to their large population size.

### Threats to Connectivity:

- **Central India** faces threats from growing linear infrastructure like **highways, railway lines, mining activities, and other development projects.**
- Such infrastructure creates **fragmented populations** confined within **small habitat patches.**

### Conservation Implications

- **Gaur** and **sambar** are **crucial prey species** for **large carnivores** like
- Both species face threats from habitat fragmentation, habitat loss, illegal poaching, and other anthropogenic impacts.

### Sambar deer:

- The **sambar** (*Rusa unicolor*) is a **large deer native** to the **Indian subcontinent, South China** and **Southeast Asia** that has been listed as a **vulnerable species** on the IUCN Red List since 2008.
- **Distribution:** **South Asia** as far **north** as the **south-facing slopes of the Himalayas** in **Nepal, Bhutan** and **India**, in **mainland Southeast Asia** including **Burma, Thailand, Indochina, the Malay Peninsula, Indonesia** (Sumatra and Borneo), **Taiwan**, and **South China, including Hainan.**
- Prefers the dense cover of deciduous shrubs and grasses.
- Sambar are **nocturnal** or **crepuscular.**

### Gaur:

- The **gaur** is a **bovine native to South Asia and Southeast Asia** and has been listed as **Vulnerable** on the **IUCN Red List** since
- The **global population** was estimated at a **maximum of 21,000 mature individuals** in **2016**, with the **majority of those existing in India.**
- It is the **largest species** among the **wild cattle** and the **domesticated form of the gaur** is called **gayal (*Bos frontalis*)** or **Mithun.**
- **IUCN status:** Vulnerable

### Protected Areas:

- **Kanha Tiger Reserve-** Madhya Pradesh
- **Pench Tiger Reserve-** Madhya Pradesh
- **Umred Karhandla Wildlife Sanctuary-** Khaksi, Maharashtra
- **Nagzira-Nawagaon Tiger Reserve-** Maharashtra
- **Bor Tiger Reserve-** Maharashtra
- **Tadoba-Andhari Tiger Reserve-** Maharashtra

### IUCN Red List update: Invasive species and illegal trade push reptiles and cacti closer to extinction

#### Sub: Env

#### Sec: Biodiversity

#### Context:

- The IUCN Red List highlights **severe threats** to **island reptiles** from **invasive species.**

#### Invasive Species and Reptile Declines:

- The **Ibiza wall lizard (*Podarcis pityusensis*)** is now **endangered** due to a **50% population decline** caused by the **invasive horseshoe whip snake (*Hemorrhois hippocrepis*).**
- The **Gran Canaria giant lizard (*Gallotia stehlini*)** and **Gran Canaria skink (*Chalcides sexlineatus*)** found in **Gran Canaria**, an island in **Spain**, face **extinction** from the introduced **California kingsnake (*Lampropeltis californiae*),** with population declines of over **50%** since 2014.
- Both species have been **reclassified** from **least concern** to

#### Illegal Trade and Cactus Endangerment:

- The **illegal trade of ornamental cacti** poses a significant threat to species in **Chile's Atacama desert.**
- **82%** of **Copiapoa cacti** species are now **critically endangered**, up from **55%** in **2013**, driven by **high demand** in **Europe** and
- **Climate change** exacerbates the threat, disrupting the **oceanic fog** crucial for their **hydration.**
- **Poached cacti** are distinguishable by their **grey tone** and **dusty bloom**, unlike the **greener cultivated plants.**

#### IUCN Recommendations

- International collaboration is necessary to prevent the transportation of poached plants.
- Greenhouses offer a sustainable alternative for cultivating **Copiapoa cacti.**

- Urgent action is needed to address the **rising extinction risk of Copiapoa cacti**, with **82%** now at risk compared to **55%** in the last major assessment.

## New Study Links CO2 Increase to Rainfall Changes, Impacts on Biodiversity Hotspots

**Sub: Environment**

**Sec: Climate Change**

**Context:**

- Research by scientists from the **Birbal Sahni Institute of Palaeosciences (BSIP)** suggests that **evergreen forests** in the **Western Ghats, northeast India**, and the **Andaman Islands** may be replaced by **deciduous forests** due to these climate shifts.

**Details:**

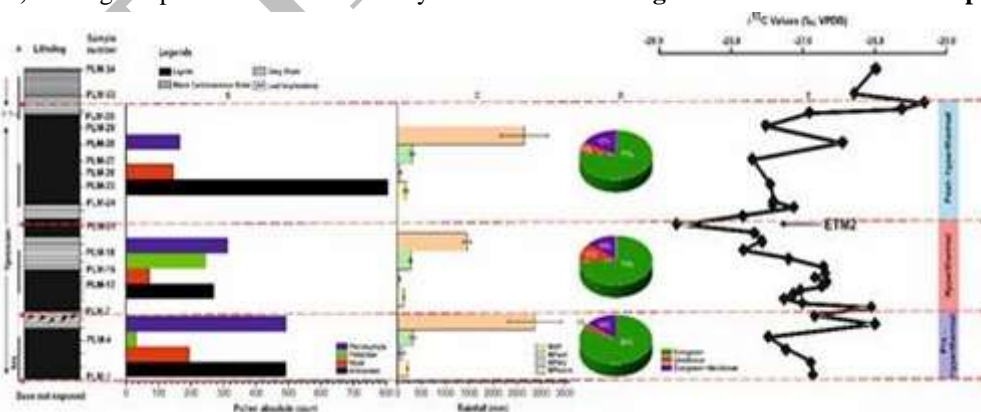
- Rising greenhouse gas levels** could significantly **alter rainfall patterns** in **equatorial regions**, potentially **transforming India's biodiversity hotspots**.
- The study examined **fossil pollen** and **carbon isotope data** from the **Eocene Thermal Maximum 2 (ETM-2)**, a period of **global warming** that occurred approximately **54 million years ago**.
- This era serves as a potential analogue for **future climate scenarios**, offering valuable insights into the effects of increased atmospheric carbon dioxide on tropical ecosystems.

**Research Focus and Findings:**

- Researchers focused on the **Panandhro Lignite Mine in Gujarat**, which provided a unique opportunity to study **vegetation-climate relationships** near the **equator** during the **ETM-2**.
- Analysis of **fossil pollen** revealed that **when atmospheric CO2 concentrations exceeded 1000 ppmv** near the **paleo-equator**, **rainfall decreased significantly**, leading to an **expansion of deciduous forests**.
- The study raises important questions about the **survival of equatorial/tropical rainforests** and **biodiversity hotspots** under **increased carbon emissions**.
- It helps understand the relationship between **CO2** and the **hydrological cycle** and aids in the future conservation of biodiversity hotspots.

**Deep-Time Hyperthermal Events as Climate Analogs:**

- Deep-time hyperthermal events** are considered **potential analogues for future climate predictions**. However, data on these hyperthermal events are mainly known from the **mid- and high-latitude regions**.
- There is a lack of quantitative data from the **equatorial or tropical regions**.
- Researchers from **BSIP**, an autonomous institute of the Department of Science and Technology, used **fossil pollen** and **carbon isotope data** from the **ETM-2** to **quantify the terrestrial hydrological cycle during that period**.
- During the **ETM-2**, the **Indian plate lingered near the equator** during its journey from the **southern to the northern hemisphere**, making it a perfect natural laboratory to understand the **vegetation-climate relationship near the equator**.



**Biodiversity Hotspots:**

- There are currently **36 recognized biodiversity hotspots**. These are Earth's most biologically rich—yet threatened—terrestrial regions.
- To qualify as a biodiversity hotspot, a region must meet two strict criteria:**
  - It must have at least 1,500 vascular plants as endemics — which is to say, it must have a high percentage of plant life found nowhere else on the planet. A hotspot, in other words, is irreplaceable.
  - It must have 30% or less of its original natural vegetation. In other words, it must be threatened.
- There are 4 BHs in India:**

1. The Himalayas.
2. Indo-Burma Region.
3. The Western Ghats.
4. Sundaland.

## The shape of a five-year climate agenda for India

### Sub: Environment

#### Sec: Climate change

##### Impact of Government's Climate Action Choices:

- Choices will affect all Ministries and sectors.
- Influences India's economic sustainability and global position.
- Focus on climate finance and justice over the next five years.

##### India's Transformation:

- Significant progress in climate action over the last decade.
- Established global institutions like the **International Solar Alliance**, Coalition for Disaster Resilient Infrastructure, and the Global Biofuels Alliance, as well as shaped the **Green Development Pact** under its **G-20 presidency** last year.
- The **2070 net-zero target** and ambitious **Nationally Determined Contributions (NDC)**.
- Domestic policies now include sustainability, such as the **Indian emissions carbon trading scheme**.

##### Future Goals for the Government:

- Accelerate sustainable economic development.
- Adopt the mantra '**go higher, go wider, go deeper**' to align climate leadership with economic growth.

##### Global Leadership (Go Higher):

- 'Go higher' relates to India's global leadership.
- Host significant international climate summits, potentially the **UN Conference of Parties in 2028**.
- **Aim** for consensus on issues like **halting new oil and gas investments post-2030** and securing **adaptation finance**.
- Promote **equity** in international forums and lead global institutions for climate finance.

##### Broaden Targets Beyond Power Sector (Go Wider):

- '**Go wider**' means **India** has to adopt and strongly communicate sectoral emission reduction targets that go beyond the power sector.
- Set sectoral emission reduction targets beyond the **power sector**.
- Focus on **zero-carbon mobility**, including **two- and four-wheelers**, to boost rural mobility and clean energy jobs.
- Use the **2035 NDC submission** as an opportunity to expand **energy transition targets**.

##### State-Level Climate Action (Go Deeper):

- **Going deeper** implies that **sub-national climate action and resilience** must come to the fore in this term of the government.
- Collaborate with States like Tamil Nadu and Bihar on **net-zero plans**.
- Create a **Centre-State coordination group** and **incentivize State-level actions** through the **Sixteenth Finance Commission**.
- Promote scientific modelling in policymaking and establish unified data measurement and reporting architecture.

##### Long-Term Vision:

- Aim for sustained climate leadership over the next four to five years.
- Strengthen India's position at international tables and demonstrate climate action prowess.

## Strategic planting of 'energy' crops could mitigate biodiversity loss, study finds

### Sub: Environment

#### Sec: Climate change

##### Context:

- Study titled '**Balancing bioenergy expansion and restoration: Global shifts in biodiversity intactness**' emphasised that prioritising degraded or abandoned agricultural land for energy crops offers greater benefit.

##### About Bioenergy Crops:

- Refer to **plants specifically grown for the purpose of producing biomass** that can be converted into **energy**. It includes **energy grasses, oilseeds, and lignocellulosic crops**.

- Classified into **three development stages**:
  - **First Generation:** Energy conversion technologies exist like sugar crops, starch, and oil crops, etc.
  - **Second Generation:** Energy Conversion technologies are under development. Involves switching from food to non-food lignocelluloses like polysaccharides cellulose, etc.
  - **Third Generation:** Involves future technologies such as genetically modified crops, etc.
- **Challenges in Bioenergy crop production:** Land use conflicts, food security (conversion of agricultural land for bioenergy), transporting wet biomass from the plantation to the production site becomes energetically unfavorable and costly, etc.

#### Key Findings from the Study

- Prioritizing degraded or abandoned agricultural land for energy crops offers the greatest benefit.
- Planting energy crops in areas with high natural vegetation cover significantly reduces biodiversity, especially in tropical regions.
- Energy crop plantations can be more beneficial for biodiversity than current agricultural practices, particularly with diverse plant mixes in agriculturally dominated areas.
- Increasing landscape complexity can have ecological advantages.

#### Importance of Strategic Land-Use Planning:

- Essential for achieving **bioenergy, climate change mitigation, and biodiversity restoration goals**.
- Energy crops on existing agricultural land reduce biodiversity losses compared to converting natural habitats.

#### Impact on Biodiversity

- Restoring priority areas for **natural vegetation** has the most significant positive impact on biodiversity.
- Strategically planting energy crops on existing agricultural land is less harmful than converting natural habitats.
- The **Biodiversity Intactness Index (BII)** was used to measure the impact, comparing current native species abundance with pre-human impact levels.
- **Energy crops** could be least detrimental to **BII** in places like Central Europe, and the east coasts of the **USA** and **China**, with potential small benefits in **West Africa**.

#### India's Initiatives for Bio-Energy:

- **National Bioenergy Programme** (By Union Ministry of New and Renewable Energy)
- **Comprises 3 sub-schemes**:
  1. **Waste to Energy Programme:** Programme on Energy from Urban, Industrial, and Agricultural Wastes /Residues.
  2. **Biomass Programme:** Scheme to Support the Manufacturing of Briquettes & Pellets and Promotion of Biomass (non-bagasse) based cogeneration in Industries.
  3. **Biogas Programme:** For setting up of biogas plants.

#### Why rising Arctic wildfires are a bad news for the world

##### Sub: Environment

##### Sec: Climate change

##### Recent Arctic Wildfires:

- **Wildfires** have darkened the skies over the **Arctic** for the **third time in five years**.
- Most fires are in **Sakha, Russia**, with over **160 wildfires** burning **nearly 460,000 hectares** by June 24.
- June 2024 carbon emissions from these wildfires were **6.8 megatonnes**, the **third highest in two decades**.

##### Increasing Frequency and Scale:

- **Wildfires** have been a **natural part** of the **Arctic's boreal forest** or **snow forest** and **tundra (treeless regions) ecosystems**.
- **Arctic wildfires** are increasing due to **global warming**.
- The **Arctic** is **warming four times faster** than the **global average (1.1 degree celsius)**, now **3 degrees Celsius warmer** than in **1980**.
- **Increased warming** leads to more frequent **lightning** and **wildfires**.
- **Soaring temperatures** slow the **polar jet stream**, causing unseasonably warm weather and heatwaves, which further increase wildfire risk.
- By **2050**, **wildfires** in the **Arctic** and **globally** could **increase by one-third**.

##### Exacerbating Global Warming:

- **Wildfires** release **greenhouse gases** like **CO2**, contributing to climate change.



- The greater concern is the carbon stored in **Arctic permafrost**, which holds around **1,700 billion metric tons of carbon**.
- **Wildfires** make **permafrost** more vulnerable to **thawing**, releasing this **stored carbon into the atmosphere**.
- **Large-scale thawing** could release massive amounts of carbon, making it impossible to limit **global warming to 1.5 degrees Celsius**, resulting in **catastrophic consequences**.

#### Europe's Copernicus Climate Change Service (C3S):

- It supports society by providing authoritative information about the **past, present and future climate in Europe and the rest of the World**.
- The **C3S mission** is to support **adaptation and mitigation policies of the European Union** by providing consistent and authoritative information about **climate change**.
- **C3S offer free and open access to climate data and tools** based on the best available science.

#### As ocean surfaces acidify, a deep-sea acidic zone is expanding: Marine habitats are being squeezed

**Sub: Env**

**Sec: Climate change**

#### Carbon compensation depth (CCD):

- In the **deepest parts of the ocean**, below **4,000 metres**, the **combination of high pressure and low temperature** creates conditions that **dissolve calcium carbonate**, the material marine animals use to make their shells.
- This zone is known as the **carbonate compensation depth (CCD)** – and it is **expanding** causing **more areas where calcium carbonate dissolves**.
- **Rising carbon dioxide levels lower ocean pH, increasing ocean acidity and raising the lysocline**, where **calcium carbonate becomes unstable**.

#### Impact on Ocean Floor:

- The **lysocline** has **risen nearly 100 meters** since **pre-industrial times** and is expected to rise several hundred meters more this century.
- Millions of square kilometres of ocean floor will **transition to chemically unstable**, leading to **sediment dissolution**.

#### Distinct Habitats and Rising Boundaries:

- The **calcite saturation depth (upper limit)** and **calcite compensation depth (lower limit)** define **zones with and without calcium carbonate**.
- Currently, **41%** of the **ocean floor** is **below the calcite compensation depth**, a figure that could **increase to 51%** with a **300-meter rise**.
- Different species dominate habitats above and below the **calcite compensation depth**, with more **calcified organisms above and non-calcified ones below**.

#### Additional Climate Change Effects:

- **Marine habitats** are **shrinking** due to **rising calcite compensation depth** and **warming waters at low latitudes**.
- **Decreased oxygen levels and rising temperatures** further **threaten marine species**.

#### Island Nations Most Affected:

- **Island nations' exclusive economic zones (EEZs)** will be significantly impacted by **rising calcite compensation depth**.
- **Bermuda's EEZ** could see **68%** of its **seabed affected**, compared to **6%** of the **US EEZ** and **39%** of the **Russian EEZ**.

#### Global Implications:

- Currently, **41%** of the **deep sea** is **effectively acidic**, a figure that may reach **50%** by the **century's end**.
- The first study on the effects of this acidity on marine life was published only recently.

#### India's first green steel initiative

**Sub: Environment**

**Sec: Climate change**

#### Why in news?

A consortium headed by the **Institute of Minerals and Materials Technology (IMMT)** has expressed interest to **pilot India's first green steel-making initiative** using **100 per cent hydrogen-based DRI production method**. The project will be partly supported by the steel ministry.

#### What is Green Steel?

Green steel is the eco-friendly production of steel with substantially **lower carbon emissions**.

The pilots will use hydrogen as an alternative to conventional coking coal.



### Three steel-making methods:

1. 100 per cent hydrogen-based DRI production
2. Injecting hydrogen into an existing blast furnace
3. Blending of hydrogen with natural gas in an existing DRI plant so as to gradually bring down fossil fuel usage.

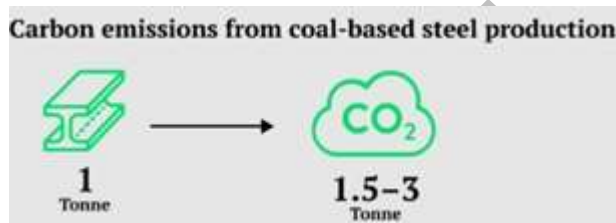
Recently IIT-Roorkee came up with bio-coke as an alternative to coking coal.

### **What is Direct Reduction of Iron (DRI)**

In industrial-scale hydrogen-iron making, also known as direct reduction of iron (DRI) using hydrogen, the oxygen is removed from the iron-ore. But instead of using high carbon emitting fossil fuels, it is done using hydrogen with the waste gas being water. The DRI so produced, also called **sponge iron**, is then fed into an electric arc furnace where electrodes generate a current to use it to produce steel.

### **Need for green steel**

- Steel production in India remains **heavily dependent on coking coal** in traditional blast furnaces, which produces **huge amounts of carbon**
- **Electric arc furnaces** typically used in the recycling of scrap or final stages of steel production are less carbon-intensive. But can also be **highly polluting**.
- Steel production is calculated to be responsible for **7-9 per cent of the world's annual CO<sub>2</sub> emissions**, according to the World Steel Association.
- **India's domestic steel sector** contributes **12%** of the country's greenhouse gas emissions, with an emission intensity of **55 tonnes of CO<sub>2</sub> per tonne** of crude steel, higher than the global average of 1.9 tonnes of CO<sub>2</sub>.



### **Green Steel Initiatives**

<b>India</b>	<b>Steel Ministry</b> is developing a comprehensive <b>green steel policy</b> , encompassing the manufacturing process, required skill set, and funding support, as part of a complete <b>decarbonization strategy</b> .
<b>Global</b>	<b>1. First Movers Coalition</b> initiative of the <b>World Economic Forum</b> to decarbonize industrial sectors like steel. <b>2.</b> By 2030, the <b>European Union</b> is projected to host nearly 50 green and low-carbon steel projects, driven by policies like <b>Carbon Border Adjustment Mechanism</b> .

### **Air pollution harms pollinators more than pests, study finds**

**Sub: Environment**

**Sec: Climate**

A study by researchers from University of Reading found that:

- Pollinators including bees, moths and butterflies experienced a **39% decline in foraging efficiency** after being exposed to elevated air pollution levels.
- In contrast, plant-eating aphids and other pests were not significantly impacted.

### **How pollutants affect insects?**

- Beneficial insects such as bees and wasps are more affected by air pollution due to their **reliance on scent-based communication**.
- Insects use **airborne chemical signals to locate flowers, find mates, or hunt their prey**.
- Air pollutants can chemically alter these scent trails or interfere with insects' ability to detect them, essentially disrupting their sensory landscape.
- In contrast, many pests rely less on long-distance scent cues and more on direct contact or visual cues, making them less vulnerable to air pollution's effects on airborne chemical signals.
- The study focused on various aspects, including feeding, growth, survival, reproduction, and ability to locate food sources.

- Of all these factors, **insects' ability to find food was most severely impaired by air pollution**, declining by about one-third on average.

#### **Detrimental Air Pollutants**

- Among air pollutants, **ozone** emerged as particularly harmful to beneficial insects, reducing their ability to thrive and carry out their roles in the ecosystem by 35%.
- Even low ozone levels below current air quality standards can cause significant damage.
- **Nitrogen oxides** also substantially impaired beneficial insects.

### **India-Japan Carbon Crediting Mechanism**

#### **Sub : Env**

#### **Sec: Climate change**

- **Objective:**
  - **India plans to enter into a carbon trading and carbon credit adjustment mechanism with Japan.**
  - **Joint Crediting Mechanism (JCM)** with shared emission-reduction credits.
- **Memorandum of Cooperation (MoC):**
  - **India and Japan** plan to sign an MoC to establish the JCM.
  - **MoEFCC (Ministry of Environment, Forest and Climate Change)** authorized to sign the MoC.
- **Carbon Credits Allocation:**
  - Carbon credits will be allocated through a structured process.
  - Registry to track these credits.
  - Credits allocated to respective registries of India and Japan.
  - **Used towards the Nationally Determined Contribution (NDC)** of both countries.
  - **Credits can be used for NDCs and international mitigation purposes.**
- **Economic and Financial Impact:**
  - **Boost job creation by attracting investments in low-carbon and clean technologies.**
  - Financial implications included in project planning.
- **Technological Facilitation:**
  - Japan to facilitate the **transfer of technology, finance, and capacity building.**
- **Paris Agreement Compliance:**
  - **JCM formed under Article 6.2 of the Paris Agreement.**
  - Implementation according to relevant domestic laws and regulations.
- **Joint Committee Responsibilities:**
  - Develop rules, guidelines, and procedures for JCM.
  - Cover project cycle **procedures, methodologies, design documents, monitoring, and third-party entities designation.**
  - **Decisions require prior confirmation from both governments unless specified otherwise.**
- **Emission Reductions Recognition:**
  - **Credits contribute to the NDCs of both countries while avoiding double counting.**

#### **Key Points:**

- **India and Japan** collaborate on a carbon trading and credit adjustment mechanism.
- **Joint Crediting Mechanism (JCM)** established with shared emission-reduction credits.
- **Projects approved by a Joint Committee** and credits tracked via a registry.
- Credits allocated to **India and Japan's registries** and used for NDCs.
- **Boost job creation by attracting investments in low-carbon and clean technologies.**
- **Japan facilitates the transfer of technology, finance, and capacity building.**
- **JCM formed under Article 6.2 of the Paris Agreement** and follows domestic laws.
- **Joint Committee develops rules and guidelines for JCM implementation.**

#### **Carbon Credits and Carbon Credit Mechanisms**

##### **Purpose of Carbon Credits:**

- **Carbon Credit:** A financial instrument issued to an **entity (company or body) for activities that avoid the emission of CO<sub>2</sub> or absorb already emitted CO<sub>2</sub> (sequestration).**

- **Permit:** Allows the holder to emit a certain amount of CO<sub>2</sub> or other greenhouse gases. One credit equals one ton of CO<sub>2</sub>.
- **Mechanism:** Devised to reduce greenhouse gas emissions through market-oriented approaches.
- **Cap-and-Trade System:**
  - **Credits Allocation:** Companies receive a set number of credits, which decline over time.
  - **Trade:** Companies can sell excess credits to other companies.
  - **Incentive:** Encourages companies to reduce emissions as they can profit from selling surplus credits.

#### History and Development:

- **Kyoto Protocol (1997):** Created a market for reducing greenhouse gases by assigning monetary value to emission reductions.
  - **Clean Development Mechanism (CDM):** One of the flexible mechanisms defined by the Kyoto Protocol.
  - **Reduction Targets:** Signatory countries agreed to specific reduction targets.
  - **Carbon Credits Trading:** Credits can be sold to governments or companies failing to meet reduction targets.
- **Durban Climate Change Conference (2011):** Expanded and updated goals from the initial Kyoto Protocol agreement.
- **Paris Agreement (2020):** Replaced the Kyoto Protocol, **continuing the carbon markets.**

#### Mechanisms Under Kyoto Protocol:

- **Removal Unit (RMU):** Based on land use, land-use change, and forestry activities like reforestation.
- **Emission Reduction Unit (ERU):** Generated by a joint implementation project.
- **Certified Emission Reduction (CER):** From a clean development mechanism project activity.
- **Registry Systems:** Track and record transfers and acquisitions of these units.

#### Internationally Transferred Mitigation Outcomes (ITMO):

- **New Mechanism:** For international emissions trading between Parties to the Paris Agreement.
  - **Article 6(2) of Paris Agreement:** Stipulates general rules but details are still to be established.
- **Adjustment Mechanism:** Ensures only one party takes credit for emission reductions.
- **NDC Compliance:** Countries can include emission reductions from other countries in their NDC.
- **Financial Flexibility:**
  - **Buyer Country:** Can finance lower-cost emissions reductions in another country to meet its own commitment.
  - **Seller Country:** Can finance domestic mitigation beyond its resources.

#### A green wealth tax in Budget 2024

**Sub: Env**

**Sec: Climate change**

Indian Green Deal (IGD)	
<b>About</b>	Proposed development model focusing on <b>just, inclusive, and sustainable growth.</b>
<b>Components</b>	Green energy, infrastructure, and care economy (health and education).
<b>Spending Allocation</b>	5% on infrastructure, 3% on care economy, and 2% on green energy.
<b>Funding IGD</b>	The wealth tax rate of 1.7% initially, declining to 1.3% by 2032 due to the projected rise in the wealth of the Indian elite.
<b>Employment Generation</b>	IGD could generate 38.7 million jobs, equivalent to 8.2% of the Indian labour force.

#### What is Wealth Tax?

- **Wealth tax** is categorised as a **direct tax**, targeting individual assets like **cash, shares, and property.**
- **India's Wealth Tax Act**, established in **1957**, imposed a **1% tax** on **earnings exceeding Rs 30 lakh per year.** However, due to ineffective implementation, the Act was **repealed in 2015.**
- **India** has seen a **rise in billionaires**, with **94 new additions**, reaching a total of **271.** A study by **Thomas Piketty** highlights **extreme wealth disparity in India**, indicating the **richest 1% hold a disproportionately large share of wealth.**
- The **EU Tax Observatory**, a **European tax think tank**, has proposed a **global minimum tax of 2% on billionaires' wealth**, potentially **generating approximately \$250 billion annually.**

### Carbon footprint:

- The **World Health Organization (WHO)** defines a **carbon footprint** as a **measure of the impact of human activities** on the **production of carbon dioxide (CO<sub>2</sub>)** resulting from the **combustion of fossil fuels**. It is **quantified** in terms of the **weight of CO<sub>2</sub> emissions produced, measured in tonnes**.
- This **metric** is applicable to **individuals, organizations, products, events, and other entities**.
- The **rising emissions** by the **Indian elite** have been led by their **conspicuous consumption of carbon-intensive commodities** such as housing, industrial goods, transport and clothing.
- The **per capita carbon footprint** of the **top 10% of the Indian population** is almost equal to that of a **first world citizen**.

### South Africa's new law on climate change

**Subject: Env**

**Sec: Climate Change**

#### Context:

South Africa's President, Cyril Ramaphosa, **signed into law a piece of legislation** that will impose mandatory curbs on the **emissions from large, fossil-fuel heavy industries** and, **require climate-adaptation plans** from towns and villages. The President said this would enable South Africa to meet its **emissions reduction** commitments under the **Paris agreement**.

#### Significance of this law:

- The **Climate Change Bill** was approved by **South Africa's National Assembly**.
- South Africa **relies on coal** as its **primary fuel source for electricity generation** and is one of the **world's top 15 greenhouse gas (GHG) emitters**.
- **Net emissions in 2017** were estimated at **512 million tonnes of carbon dioxide** equivalent (Mt CO<sub>2</sub>e), an **increase of 14% from 2000**.
- The **energy sector** represents roughly **80% of gross emissions**, with **energy industries (~60%)** and **transport (~12%)**.

#### Objectives of the Climate Change Act

- The main goal of the act is to **cut down on greenhouse gas emissions**, which are **high in South Africa** because the country **gets most of its energy from coal**.
- The country is **one of the biggest producers of carbon dioxide** and has been having a hard time meeting its **goals for lowering pollution**.

#### Carbon Budget Allocations

- The law sets up a **carbon budget method for big companies** that **release a lot of greenhouse gases**.
- Each big company that **emits will have its pollution limited** for a certain amount of time.
- Companies will have to **pay more in carbon taxes** if they go over this limit, even though it's not illegal to do so.

#### Steps has South Africa taken:

- Every country submits **Nationally Determined Contributions (NDC)**, which are time-bound commitments to **lower emissions**.
- South Africa submitted its **first NDC in 2016** and its **updated NDC in 2021**. The updated NDC **commits to 31% reduction**.
- **NDC outlines an approach for a 'just transition,'** to achieve **targets, focusing on agriculture, forestry and other land use, energy, industrial processes and product use, and waste sectors**.
- **South Africa has estimated that it requires \$8 billion per year by 2030**. It has set an **internal goal of reaching 'net zero emissions' by 2050** in its **Low-Emission Development Strategy** submitted in 2020.
- The **Presidential Climate Commission** released its **Just Transition Framework in 2022**, which **aims to inform policy making at the nexus of climate and development to enable deep, just transformational shifts**. These were the actions that preceded the **signing of the Climate Change Bill**.

### Wild guess

**Sub: Env**

**Sec: Ecosystem**

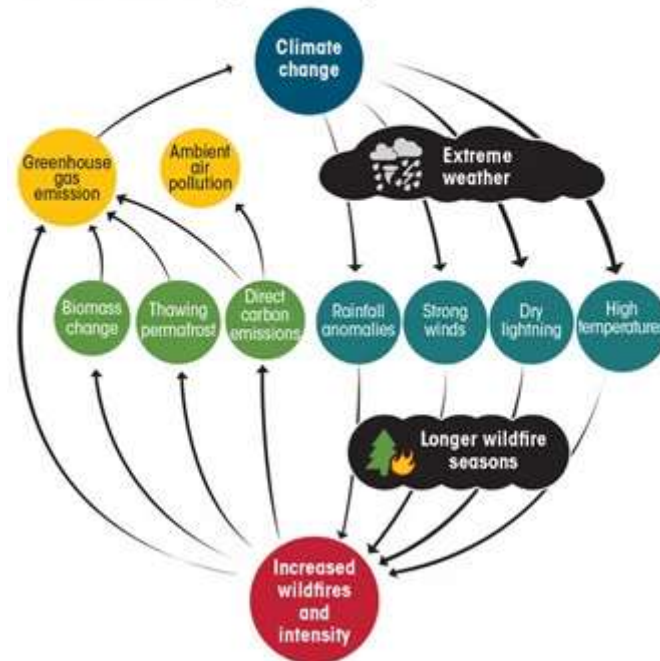
#### Wildfires as Major CO<sub>2</sub> Emitters:

- If wildfire-affected areas were a country, they would be the **second-largest emitter of CO<sub>2</sub>, only behind China**.
- In **2023, global wildfires** released **7,330 million tonnes of CO<sub>2</sub>**, surpassing the **6,000 million tonnes of greenhouse gases** emitted by the **US in 2022**.

- Calculating **wildfire emissions** is challenging due to variables like **temperature, wind, humidity, and drought**.
- **Global warming** has **increased the frequency and intensity of wildfires**, leading to **higher CO2 emissions**.

### Caught in a loop

Climate change increases the frequency and severity of extreme weather, leading to more frequent and longer wildfire seasons. This heightened wildfire activity further boosts greenhouse gas emissions, exacerbating climate change



#### Measurement Uncertainties:

- The **margin of error for wildfire-related CO2 emissions** can be as high as **20%**, compared to **6%** for **fossil fuel combustion**.
- Measuring emissions requires data on **burned area, biomass density, emission factors, and combustion factors**.
- Methods like the **Global Fire Assimilation System (GFAS)** and **Moderate Resolution Imaging Spectroradiometer (MODIS)** have limitations, often underestimating emissions.

#### Smouldering Fires and Emission Factors:

- **Smouldering fires emit large amounts of carbon** and are difficult to detect and suppress.
- **Peatlands, covering 3% of the world's landmass, store significant carbon** and are prone to smouldering fires.
- **Emission factors** vary by region and vegetation type, with limited data from the Global South.

#### India's Wildfire Emissions:

- **India's forest fire emissions** contribute **1-1.5%** of **global wildfire emissions**.
- **Climate change** could increase fire-prone areas in regions like **Himachal Pradesh** and **Uttarakhand**.

#### Global Fire Assimilation System (GFAS):

- GFAS assimilates **fire radiative power (FRP) observations** from satellite-based sensors to produce daily estimates of emissions from wildfires and biomass burning.
- **FRP** is a measure of the energy released by the fire and is therefore a measure of how much vegetation is burned.

#### Moderate Resolution Imaging Spectroradiometer (MODIS):

- **MODIS** is a **satellite-based sensor** used for **earth and climate measurements**.
- There are **two MODIS sensors in Earth orbit**: one on board the **Terra (EOS AM) satellite**, launched by **NASA in 1999**; and one on board the **Aqua (EOS PM) satellite**, launched in **2002**.
- **MODIS** has now been replaced by the **Visible Infrared Imaging Radiometer Suite (VIIRS)**, which was first launched in **2011** aboard the **Suomi NPP satellite**.

#### Biomass Burning Uncertainty: Reactions, Emissions, and Dynamics (BBURNED):

- **BBURNED** aims to better quantify the current understanding of the uncertainty and variability in **biomass burning emission estimation**, and determine how to more accurately represent **atmospheric chemistry** resulting from fire.



- **BBURNED** is an activity of the **IGAC Project** (International Global Atmospheric Chemistry) at the **University of Colorado / CIRES**.

### Major Greenhouse Gas Sources, Lifespans, and Possible Added Heat

Greenhouse Gas	Sources (Contributions to Global Warming)	Average Lifetime in the Atmosphere	Possible Added Heat ("Global Warming Potential") Over a 20-Year Period	Possible Added Heat Over a 100-Year Period
<b>Carbon Dioxide</b>	<b>Human sources (100%):</b> mostly the burning of fossil fuels (such as coal, oil, and natural gas), deforestation/land-use change, and wildfires/biomass (plant material) burning. <b>Natural sources (0%):</b> volcanic eruptions, respiration, weathering of certain rocks, and wildfires/biomass burning; permafrost	Hundreds to thousands of years; about 25% of it lasts effectively forever	Carbon dioxide is used as a reference point for other greenhouse gases, so its possible added warming (or global warming potential, GWP) is 1.	Carbon dioxide is used as a reference point for other greenhouse gases, so its possible added warming (or global warming potential, GWP) is 1.
<b>Methane</b>	<b>Human sources (82%):</b> leaks from fossil fuel production and transportation facilities; livestock digestion and manure; rice farming; natural gas; wildfires/biomass burning. <b>Natural sources (18%):</b> plant matter breakdown in wetlands, lakes, ponds; wildfires/biomass burning; landfills, oceans, sediment; volcanoes; permafrost	About a decade	One metric ton can trap <b>about 80 times</b> the heat of 1 metric ton of carbon dioxide.	One metric ton of methane can trap <b>about 30 times</b> the heat of 1 metric ton of carbon dioxide.
<b>Nitrous Oxide</b>	<b>Human sources (40%):</b> production and use of organic and commercial fertilizer; burning fossil fuels; burning vegetation. <b>Natural sources (60%):</b> bacteria breaking down nitrogen in soils and the ocean	About 110 years	One metric ton can trap <b>273 times</b> the heat of 1 metric ton of carbon dioxide.	One metric ton can trap <b>273 times</b> the heat of 1 metric ton of carbon dioxide.
<b>Chlorofluorocarbons (CFCs, namely CFC-11, CFC-12, CFC-113)</b>	<b>Human sources (100%):</b> refrigerants, solvents (a substance that dissolves others); spray-can propellants. <b>Natural sources:</b> effectively none	About 52 to 93 years	One metric ton can trap <b>thousands to tens of thousands of times</b> the heat of 1 metric ton of carbon dioxide.	One metric ton can trap <b>thousands to tens of thousands of times</b> the heat of 1 metric ton of carbon dioxide.

### State of the World's Forests 2024: Global efforts curb deforestation, but threats to forests from wildfires and pests remain

**Sub: Env**

**Sec: Eco system**

#### State of the World's Forests Report:

- The FAO released a report on **July 22, 2024**, highlighting both **relief** and **concern regarding global forests**.
- The **rate of deforestation has slowed**, but **climate change** continues to pose significant threats.

#### Deforestation and Forest Cover:

- **Global forest cover in 2020** was approximately **4.1 billion hectares**, with major contributions from **Russia, Brazil, Canada, the USA, and China**.
- From **1990 to 2020**, around **420 million hectares** of forest were converted to other land uses.
- **Deforestation rates decreased** from **15.8 million hectares per year (1990-2002)** to **10.2 million hectares per year (2015-2020)**.

#### Regional Trends in Deforestation:

- **Africa, South America, and Asia** had the **highest deforestation rates**, with **Africa losing 4.41 million hectares annually**.
- Several countries, including **China, Australia, and India**, recorded **gains in forest area in 2020**.
- **Indonesia** saw an **8.4% decrease in deforestation in 2021-22** compared to **2020-21**, the lowest since 1990.
- **Brazil** reported a **50% reduction in deforestation in the Legal Amazon region in 2023**.

#### Mangroves and Their Resilience:

- The **global mangrove area was 14.8 million hectares**, with **South and Southeast Asia** contributing nearly **44%**.
- **Gross global mangrove loss decreased by 23%** between **2000-2020**.
- **Natural expansion of mangroves exceeded the loss to natural causes**, indicating resilience.



## Impact of Fires and Climate Change

- An estimated **340-370 million hectares of land** are impacted by **fires annually**, with **383 million hectares** affected in **2023**.
- The **increasing frequency and intensity of wildfires** are **contributing significantly to global carbon dioxide emissions**.
- **Boreal fires in 2021** accounted for about **10% of global carbon emissions**.

## Threats from Pests and Diseases

- Forests are threatened by pests like the **pine wood nematode**, which caused significant damage in **China, Japan, and South Korea**.
- The **USA** faces **potential losses exceeding 20%** of host tree basal area over **25 million hectares** by **2027** due to **insects and disease**.
- **Monitoring of forest degradation and pest outbreaks** is still in its early stages, making it difficult to quantify economic impacts.

## India's open ecosystems face an unusual threat: trees

**Sub: Env**

**Sec: Ecosystem**

**Context:**

- A study published in **Global Change Biology** reported that an **increase in tree cover in open ecosystems** like **savannahs** and **grasslands** has led to a **substantial decline in native grassland birds**, with the **African Savannah** experiencing a **more than 20% decrease in grassland bird populations**.

## Woody Encroachment and Its Consequences:

- **Grasslands** and **savannahs** are **biodiverse habitats in tropical and temperate regions** throughout the world.
- The **phenomenon of woody encroachment**, where **open habitats** transition to areas with **more tree and shrub cover**, leads to a **homogenized ecosystem, adversely affecting biodiversity**. **Grasslands** and **savannahs**, which cover nearly **40%** of the **earth's landmass** and support various **endemic species**, are under threat from this change.
- Factors such as **increased atmospheric CO<sub>2</sub>**, **fire suppression**, and **habitat fragmentation** contribute to **woody encroachment**. This process **alters soil conditions** and **increases predation**, particularly affecting specialist species like **grassland birds** and **rodents**.
  - **Increased atmospheric CO<sub>2</sub>** is likely to **promote trees over grasses** because the **C<sub>3</sub> photosynthetic pathway** used by **trees** is **favoured under high CO<sub>2</sub> conditions**.
- From **megaherbivores** like **elephants, rhinoceroses, and buffaloes** in **Africa and Asia** to **grassland birds** like the **bustards, floricans, and grouse** of the **Himalayan grasslands** and **American prairies**, **open ecosystems have it all**. However, we are rapidly losing them.

## Woody Encroachment in India and Beyond:

- In **India**, **grasslands** face similar threats, with **woody encroachment** occurring even in protected areas like **national parks**. Studies have shown significant **increases in tree cover** and **reductions in grassland areas** in **India and Nepal** over the last three decades.
- **Colonial conservation policies** historically classified **grasslands** as "**wastelands**," promoting their **conversion into plantations**. This mindset continues, with modern perspectives seeing open ecosystems as less valuable compared to forests for carbon sequestration.

## Ecological and Conservation Considerations:

- The **spread of invasive species**, often due to **tree plantation programs**, has exacerbated **woody encroachment in grasslands**, transforming them into **woodlands** and further **threatening native biodiversity**.
- **Long-term ecological monitoring and research** are needed to understand the **full impact of woody encroachment on grasslands** and to **inform conservation policies**. There is also a need to reassess and eliminate outdated terminologies like "**wastelands**" that misclassify and undervalue open ecosystems.

## Biodiversity Convention: Decisions on new avatar of benefit sharing on the anvil next month

**Sub: Environment**

**Sec: Int Conventions**

**Context:** In August 2024, delegates will discuss the multilateral fund for sharing benefits from the use of digital sequence information, following the publication of the **United Nations'** negotiation proposals.

**Details:**

- The requirement to share benefits is one of the three main tenets of the **Convention on Biological Diversity (CBD)**. The convention makes no recommendation on what should be done if only genetic material is used. CBD members have attempted to solve this conundrum for the better part of a decade.
- Plant, animal and microbe genetic material are all examples of **digital sequence information (DSI)**. There is currently no internationally agreed-upon definition of DSI and its scope may include other dematerialised genetic resources, such as protein sequence data.
- The decision made by the **DSI** intergovernmental negotiating group would also guide discussion of similar multilateral funds under consideration by the Food and Agriculture Organization under its International Treaty on Plant Genetic Resources for Food and Agriculture, as well as the World Health Organization's Pandemic Treaty.
- At the **UN Convention on Biological Diversity's 15th Conference of the Parties (COP15)**, held in December 2022, the parties pledged a new multilateral mechanism in which industry could contribute to a global fund that would be used to support nature conservation and sustainable use, including related activities of **Indigenous Peoples and Local Communities**, as well as building capacity worldwide to generate and use
- According to the **UN documents** released July 1, 2024, even a small percentage of revenue from products such as drugs, cosmetics and agricultural biotechnology would be worth billions of dollars.

#### **Digital Sequence Information (DSI) on Genetic Resources-**

- **Digital sequence information (DSI)** is a term used in the context of **certain international policy fora**, particularly the **Convention on Biological Diversity**, to refer to **data derived from genetic resources**.
- **DSI** refers to **data from DNA or RNA** that can be stored digitally.
- The term is generally agreed to include **nucleic acid sequence data** and may be construed to include other data types derived from or linked to **genetic resources**, including, for example, **protein sequence data**.
- The exact scope of this term is an aspect of ongoing policy discussions.
- **DSI** is crucial to research in a wide range of contexts, including **public health, medicine, biodiversity, plant and animal breeding, and evolution research**.
- The **Nagoya Protocol**, a component of the **Convention on Biological Diversity**, establishes a **right for countries to regulate, and to share in benefits** derived from, their nation's genetic resources by arranging **Access and Benefit Sharing Agreements** with users.

#### **Convention on Biological Diversity (CBD)**

- The **Convention on Biological Diversity (CBD)**, a **legally binding treaty** to conserve biodiversity has been in force since 1993. It has **3 main objectives**:
  - The conservation of biological diversity.
  - The sustainable use of the components of biological diversity.
  - The fair and equitable sharing of the benefits arising out of the utilization of genetic resources.
- Nearly all countries have ratified it (notably, the **US has signed but not ratified**).
- The **CBD Secretariat is based in Montreal, Canada** and it **operates under the United Nations Environment Programme**.
- The Parties (Countries) under Convention of Biodiversity (CBD), meet at regular intervals and these meetings are called **Conference of Parties (COP)**.
- In 2000, a supplementary agreement to the Convention known as the **Cartagena Protocol on Biosafety** was adopted. It came into force on 11<sup>th</sup> September 2003.
  - The Protocol seeks to protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology.
- The **Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS)** was adopted in 2010 in Nagoya, Japan at COP10. It entered into force on 12<sup>th</sup> October 2014.
  - It not only applies to genetic resources that are covered by the CBD, and to the benefits arising from their utilization but also covers traditional knowledge (TK) associated with genetic resources that are covered by the CBD and the benefits arising from its utilization.
- Along with the Nagoya Protocol on Genetic Resources, the COP-10 also adopted a ten-year framework for action by all countries to save biodiversity.
- Officially known as "**Strategic Plan for Biodiversity 2011-2020**", it provided a set of 20 ambitious yet achievable targets collectively known as the **Aichi Targets for biodiversity**.
- India **enacted Biological Diversity Act in 2002** for giving effect to the provisions of the CBD.

#### **Global Environment Facility**

- It is an independently operating financial organization

- GEF is multilateral financial mechanism that provides grants to developing countries for projects that benefit global environment and promote sustainable livelihoods in local communities.
- It was setup as a **fund** under **World Bank in 1991**
- In 1992, at the Rio Earth Summit, the GEF was restructured and **moved out of the World Bank** system to become a permanent, separate institution.
- Since 1994, however, the World Bank has served as the Trustee of the GEF Trust Fund and provided administrative services.
- It is based in **Washington DC**, United States.
- It addresses six designated focal areas:
  - biodiversity,
  - climate change,
  - international waters,
  - ozone depletion,
  - land degradation and
  - Persistent Organic Pollutants.
- The program supports an active portfolio of over 200 investments globally.
- GEF serves **as financial mechanism for** :
  - Convention on Biological Diversity (**CBD**)
  - United Nations Framework Convention on Climate Change (**UNFCCC**)
  - UN Convention to Combat Desertification (**UNCCD**)
  - **Stockholm** Convention on Persistent Organic Pollutants (**POPs**)
  - **Minamata** Convention on **Mercury**
- India is both **donor and recipient** of GEF.

### What are the laws preventing tree felling in Delhi?

**Sub: Environment**

**Sec: Env legislation and org**

**Context:**

- On June 26, the **Supreme Court** directed the **Delhi government and Delhi Development Authority (DDA)** to **enhance the national capital's green cover** amidst an extreme heat wave.

**Extent of Green Cover:**

- According to the '**India State of Forest Report 2021**' (ISFR), **Delhi** has the **largest forest cover** among **seven major megacities**, with **195 sq. km**, followed by **Mumbai (110.77 sq. km)** and **Bengaluru (89.02 sq. km)**.
- **Delhi's forest cover** constitutes **13.15%** of its **geographical area**, while its **tree cover** spans **147 sq. km (9.91%)**.
- Despite extensive urban development, **Delhi's overall green cover** has **increased** from **151 sq. km (10.2%)** in **2001** to **342 sq. km (23.6%)** in **2021**.

**Protection of Trees:**

- The **Delhi Preservation of Trees Act (DPTA), 1994** provides **legal protection to trees** against actions that could harm their growth or regeneration.
- **Section 2 (h)** of the Act defines "**to fell a tree**" to include **severing the trunk, uprooting, cutting, burning, or any other damaging method**.
- **Section 8** mandates **no tree or forest produce** can be removed **without prior permission** from the '**Tree Officer**', even on the privately owned property.
- Violating the Act may result in imprisonment for up to one year, a fine up to ₹1,000, or both.
- The Act establishes a '**Tree Authority**' for **tree censuses, managing nurseries, and reviewing construction proposals**.
- **Delhi's Tree Transplantation Policy, 2020** mandates **80%** of identified trees for felling must be transplanted. An affidavit revealed only **33.33%** survival rate of transplanted trees.

**Significance of Urban Forests:**

- **Urban forests** act as **carbon sinks**, essential for cities with **unhealthy air quality** indices like Delhi.
- **Trees reduce the urban heat island effect** by lowering temperatures through shading and evapotranspiration.

### India to ratify High Seas Treaty: What is the agreement — and its significance?

**Sub: Environment**

## Sec: Int conventions

### Context:

- The **Indian government** announced it would **sign** and **ratify** the **High Seas Treaty**.

### High Seas Treaty:

- The **treaty aims to maintain ocean health, reduce pollution, and sustainably use marine biodiversity and resources**.
- Known as the **Biodiversity Beyond National Jurisdictions (BBNJ) Agreement**.
- **91 countries** have **signed**; **8** have **ratified** it.
- **Objectives of the Treaty:**
  1. **Conservation and Protection:** Focuses on marine ecology conservation.
  2. **Equitable Benefit Sharing:** Ensures fair sharing of benefits from marine genetic resources.
  3. **Environmental Impact Assessments (EIA):** Mandates EIAs for activities potentially degrading marine ecosystems.
  4. **Capacity Building and Technology Transfer:** Aids developing countries in utilizing ocean benefits while conserving them.

### Scope and Legal Framework:

- Applies to **high seas beyond national jurisdiction** (beyond **200 nautical miles** or **Exclusive Economic Zones**).
  - **High seas beyond national jurisdiction** constitute about **51%** of the **total ocean area** and are considered **global commons**.
  - They **belong to no one** and **everyone enjoys equal rights for navigation, overflight, economic activities, scientific research, or Laying of infrastructure like undersea cables**.
- Governed under the broader **1982 UN Convention on the Law of the Sea (UNCLOS)**.
  - This **1982 agreement** applies to the **entire ocean area- territorial** as well as **international waters** - and lays down the **broad legal framework for governance on seas**.
  - Among other things, **defines the boundaries of territorial waters, defines the rights and duties of nations** regarding activities in the seas, and addresses issues such as **sovereignty, passage rights, and rights of economic usage of resources like fish, oil, minerals, or gas**.
- **UNCLOS** sets **general principles** but the **High Seas Treaty** implements **specific measures for international waters**.

### Marine Protected Areas (MPAs):

- **MPAs** are akin to **national parks** in the **ocean, regulating activities for conservation**.
- **Current MPAs** mainly in **territorial waters**; the **treaty aims to establish MPAs in the high seas**.
- Currently, there are **18,200 MPAs**, according to the latest update of the **World Database of Protected Areas**, the most comprehensive catalogue of **protected areas on land as well as sea**. These together cover about **8% of the total ocean area**. Almost **90% of this area is in territorial waters**.
- Part of the **Kunming-Montreal Global Biodiversity Framework** to **restore 30% of degraded marine ecosystems by 2030**.

### Equitable Sharing of Benefits:

- **High seas** host **diverse organisms** with **potential commercial value** (e.g., in drug discovery and cosmetics).
- The **treaty ensures benefits are shared equally**, with **no country having proprietary rights**.
- According to the treaty, **mandatory EIA** for any activity that can **potentially damage marine ecosystems** will have to be **made public**.
- An **EIA** is to be carried out for **activities within national jurisdictions** as well if the impacts are expected on the high seas.

### Ratification Process:

- **Ratification** is the process by which a **country agrees to be legally bound** to the **provisions of an international law**.
- The treaty becomes **international law** after **60 countries ratify it**.
- **Ratification** binds countries **legally**; signing shows agreement but is **non-binding** until **ratified**.
  - For instance, the **US** signed the **1997 Kyoto Protocol**, the predecessor to the **2015 Paris Agreement**. However, it **did not ratify** it.
- Different countries have varied **ratification processes** (legislative approval, executive decision, etc.).

## Environmental body pulls up Odisha government for building violation in forest land

### Sub: Env

### Sec: Env legislation

### Context:

- The **Forest Advisory Committee (FAC)** of the **Union Environment Ministry** reprimanded the **Odisha government** for **building walls on forest land without approval** for the proposed **Shree Jagannath International Airport in Puri**.

### Details:

- The **FAC** also requested the **State's Wildlife Warden** to **assess** the impact of the proposed airport on **Olive Ridley turtles**, which breed near the coast.
- The proposed **Puri airport** will use **27.887 hectares of forest land** and involve felling **13,504 trees**, encompassing a total of **471 hectares**, including **non-forest land**.
- The **Airports Authority of India** identified the site in **2021**, and the **Ministry of Civil Aviation** issued the site clearance certificate in September 2023.
- The **airport's total projected cost** is **₹2,023 crore** and will be built by a **public-private consortium**.

### Forest Advisory Committee (FAC)'s Role:

- **FAC** is a **statutory body**, established under the **Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980**.
- **FAC** evaluates **industrial projects requiring forest land**.
  - The **FAC** considers questions on the diversion of forest land for non-forest uses such as mining, industrial projects, and townships and advises the state government on the issue of granting forest clearances.
- The committee can **approve, reject, or impose conditions** on projects diverting forest land.
- **Satellite images** revealed **unauthorised wall construction** by an **unspecified agency without FAC and Union Environment Ministry approval**.

### Green Credit Rules: Death by trees?

**Sub: Env**

**Sec: Env legislation**

### Context:

- The **Green Credit Rules (GCR)** might **threaten** the **lesser Florican** and **other species**.

### Green Credit Rules (GCR):

- Issued in **October 2023** to **incentivize environmental protection** through **market-based mechanisms**.
- The amendment of the **1980 Forest (Conservation) Act in 2023** led to the **implementation of Green Credit Rules (GCR)**, which could **harm natural ecosystems**.
- **Industries** can **generate green credits** by **planting trees**, with specific guidelines for plantations.

### Objectives of the Green Credit Programme (GCP):

- **GCP** aims to create a **land bank for plantations** accessible via a web portal.
- It **encourages** various entities to **participate in afforestation** and **earn green credits**.
- The program utilizes **digital tools** for **registration, verification, and monitoring of plantation activities**.

### Outcomes of the GCP

- **Enhance India's forest and tree cover**.
- Build an **inventory of degraded land** suitable for plantation.
- **Encourage pro-planet actions** by rewarding green credits.

### Impact of GCR on Indian Forests:

- States must **afforest land** to compensate for diverted forests, under the 2023 amendment.
- **GCR** allows green credits to meet compensatory afforestation (CA) obligations, focusing only on plantations.
- **GCR** promotes tree planting on degraded lands, including unique ecosystems, labeled as wastelands.

### Problems with the GCR

- **GCR** lacks **emphasis on planting diverse native species** and involves industry in raising **plantations**.
- It signals a return to a **revenue-centric vision** for **India's forests**, undermining decades of conservation efforts.
- The **GCRs** fail to mention **local communities** or **their rights over forests**, which the **Forest Rights Act (FRA)** guarantees. The **2022 Rules** of the **FCA** eliminated the need for consent from the **Gram Sabha** for forest diversion.
- **Misleading Criteria and Misclassification:**
  - **Canopy closure** {**Open canopies** (densities <40%) or **Scrub** (<10%)} is used as the **sole indicator of ecological worth, misclassifying many non-forest ecosystems**.
  - **Ecosystems** like **grasslands** and **deserts** are **misclassified as degraded lands** needing afforestation.



- **Grasslands and deserts** support a **high density of mammals** and **500 million livestock** and are also important for **below-ground carbon sequestration**.
- **Tree-covered Wastelands**
  - **Open Natural Ecosystems (ONEs)** are often labelled as **wastelands**, making them **prone to tree planting**.
  - ONEs envelop **sand dunes, grasslands and thorn scrub** of the **Thar**, and the **savanna grasslands and open woody savannas** of **Madhya Pradesh, Maharashtra, and Gujarat**.
  - **Planting trees** on these lands could **harm their unique biodiversity and ecosystem services**.
- **Questionable Forest Cover and Afforestation**
- **India's reported forest cover** includes **orchards, parks, and plantations**.
- Studies suggest **plantations do not provide the same ecosystem services as natural forests**.
- **Regrowing natural forests** is more **effective for carbon sequestration and biodiversity**.
- **Compensatory Afforestation (CA) Track Record**
  - **CA programs suffer from poor survival rates** and a **lack of local community involvement** despite the availability of more than **50,000 crores**.
  - Almost 60% of the CA funds remain unspent.
  - **Plantations often fail to simulate natural forests** and address the drivers of degradation.

### What are the various efforts being taken to mitigate caller ID spoofing?

**Sub: Sci**

**Sec: Awareness in IT and Computer**

**Context:**

**What is caller ID spoofing?**

- **Caller ID spoofing** is a technique with which the phone number that a **call appears to originate from** can be **falsified**.
- Spoofing techniques have been **honed by enthusiasts, telemarketers, and fraudsters alike, over the years**.
- It is used to carry out **social engineering attacks, where the spoofed caller ID is abused for the implicit trust** that the receiving party associates with it.
- As per **Department of Telecommunication (DOT)**, using **spoofed call service is illegal** as per the **Indian Telegraph Act, Sec 25(c)**.

**What are the efforts undertaken to mitigate caller ID spoofing?**

- **The International Telecommunications Union (ITU)** in 2021 provided a reference using **Public Key Infrastructure (PKI)** based authentication which could be implemented by Indian telecom operators to **fix caller ID spoofing for good**.
- **The Telecom Regulatory Authority of India (TRAI)** had earlier recommended to telecom operators to integrate a system known as **Calling Name Presentation (CNAP)** which allows consumers to know who is calling them in a way similar to TrueCaller.
- DoT is reportedly in the process of launching a **pilot of the CNAP project**.
- DoT has devised a system to **“identify and block” international calls with a manipulated Calling Line Identity (CLI)** and has issued directions to telecom operators to prevent such calls from reaching subscribers.
- **Section 20 of The Telecommunications Act, 2023** empowers the Government to take **“temporary possession of any telecommunication service or telecommunication network from an authorized entity”** for **“any public emergency, including disaster management, or in the interest of public safety.”**

**What is the International Telecommunications Union (ITU)?**

- **The International Telecommunication Union** is a **specialized agency of the United Nations** responsible for many matters related to information and communication technologies.
- It was established on **17 May 1865** as the **International Telegraph Union**, significantly predating the UN and making it the **oldest UN agency**.
- It has a membership of **193 countries and more than 1000 companies, universities and international and regional organizations**.

**What is Telecom Regulatory Authority of India (TRAI)?**

- **The Telecom Regulatory Authority of India (TRAI)** was established in 1997 under the **Telecom Regulatory Authority of India Act, 1997**.
- **TRAI regulates** telecom services including **fixation/revision of tariffs for telecom services** which were earlier vested in the Central Government.



- It also aims to provide a fair and transparent policy environment which promotes a level playing field and facilitates fair competition.

## A grassroots model to tackle cement pollution

### **Sub: Environment**

#### **Sec: Pollution**

##### **Context:**

- **Cement** is a major industrial polluter with **CO2 emissions** (contributing approximately 7-8% of global CO2 emissions) being an inevitable output in clinker production, releasing 576 kg per tonne of cement.

##### **Rural Prosperity Mission (RPM):**

- **RPM** aims to transform adversity into prosperity by involving an **anchor client (cement plant)**, an **anchor municipality**, **surrounding villages**, and **innovative technology**.
- **Rajapalayam** in **Tamil Nadu**, with a **1.5 million tonnes per annum cement plant**, serves as a model.
- The **municipality**, with **184,000 residents** and 100 nearby villages, faces **financial constraints** and pressing community needs such as **water supply**, **fair-priced agricultural produce**, **women's empowerment**, **education**, **skilling**, and **CO2 emissions**.

##### **Addressing CO2 Emissions and Boosting Revenue:**

- Substituting **coal** with **hydrogen** in the **cement plant** can **eliminate CO2 emissions**, with **hydrogen** having **six times the calorific value of coal**.
- The **cement manufacturer** will **switch to hydrogen** if its adjusted cost, including **carbon tax**, is equal to or **lower than coal costs**. There is a demand for **green cement**, potentially available at a **15% premium**.
- Given the current coal costs and hydrogen's calorific value, the levelised hydrogen price would be around **Rs 158/kg**, about **\$2/kg**.

##### **Economics of Hydrogen:**

- **Clean energy** for hydrogen production will come from a **70 MW solar plant** in **Rajapalayam** and **2-3 MW solar plants** in each village, supplemented by **remote renewable energy for 24/7 operations**.
- **The project involves three phases:** water sourcing and transport piping (Rs 775 crore), electrolyser and floating solar plant (Rs 1,336 crore), and village electrolysers (Rs 1,211 crore), totalling Rs 1,622 crore.
- **Financing** includes **60%** (Rs 982 crore) from **government grants** and **40%** (Rs 640 crore) as **soft loans** and **vendor financing**.
- **Annual operating expenses** are **Rs 343 crore**, with **revenue from hydrogen sales** to the **cement plant** at **Rs 158/kg**, plus a **government subsidy** of **Rs 35/kg**. First-year sales revenue is estimated at **Rs 558 crore**, with a **surplus of Rs 215 crore** after expenses, sufficient for **loan repayments** and **distribution to the municipality and villages**. Profits are projected to rise to **Rs 164 crore/year** after loan repayment from the sixth year onwards.

##### **Implementation and Benefits:**

- **Phase-1** includes identifying **five new water sources** to be stored in a refurbished **180-acre reservoir**, meeting **human, agricultural, and industrial needs**.
- **Clean hydrogen** will be generated with **180 MW electrolyser capacity**, distributed between **Rajapalayam reservoir (55 MW)** and the **cement plant (125 MW)** across villages, with **hydrogen** trucked from 100 villages.
- The project will significantly **reduce carbon emissions and social costs**, generating an additional **Rs 50 crore/year** for the municipality.
- The **RPM concept** can be replicated in other cement factory locations and heavy carbon emission industries in **Tamil Nadu** and across India, substantially lifting incomes for **below poverty line (BPL) families**.

## Massive fish kill in Periyar river attributed to industrial pollution

### **Sub: Environment**

#### **Sec: Pollution**

##### **Context:**

- The **Periyar River** witnessed a **severe fish mortality event** in May, due to which fishers and cage fish farmers incurred heavy financial losses.

##### **Details:**

- Upon inspection, they found that **fish** showed signs of **distress** and later **died due to polluted water** from nearby **factories** entering the **river** when the regulator shutters were opened.
- The pungent odour from dead fish made living conditions difficult, and no proper action or compensation was provided.

- The **Periyar River** serves **5 million residents** of central Kerala for various needs.
- The **fish kill** significantly affected residents of industrial areas, including **Edayar, Eloor, and others**.
- **Causes of mass fish mortality:**
  - The fish mortality was caused by the **opening of the gates** at the **Pathalam regulator bridge upstream**, leading to the **release of polluted water**.
  - The **discharged water** contained **toxic substances** which **reduced oxygen levels** in the water, leading to a significant number of fish dying downstream.
  - The pollution led to the **production of harmful gases** and **elevated levels of hydrogen sulphide, ammonia, and heavy metals**.

#### Government Response:

- The Kerala government directed the **Department of Irrigation** to develop a **protocol** for lifting the **regulator-bridge shutters at Pathalam**.
- A coordination committee was formed, and a **total compensation of Rs. 13.55 crores** was announced for the **affected fish workers**, though it has not yet been received.

#### Periyar river:

- **Source:** Chokkampatti Mala, Periyar Tiger Reserve, Kerala.
- **Mouth:** Arabian Sea, Vembanad Lake, Kerala.
- It is the **longest river** and the **river with the largest discharge potential** in the Indian state of **Kerala**.
- It is one of the few perennial rivers in the region and provides drinking water for several major towns.
- **Idukki dam** is on **Periyar river**.
- **Tributaries:**
  - **Left-** Cheruthoni
- **Right-** Mullayar, Perinjankutti, Muthirapuzha, Edamala

#### 6 lakh fake pollution-trading certificates unearthed in three States

**Sub: Env**

**Sec: Pollution**

**Context:** The **Central Pollution Control Board (CPCB) in 2023** had unearthed more than 6,00,000 fake **pollution-trading certificates**

#### What is Extended Producer Responsibility (EPR) certificates?

- Extended Producer Responsibility (EPR) certificates are used by companies that use plastic packaging. Certificates are generated by registered plastic waste recyclers, who collect plastic waste and recycle them.
- Extended Producers Responsibility is essentially the use of financial incentives to encourage manufacturers to design environmentally friendly products by making producers accountable for their product management during end-stage consumption.
- It differs from product stewardship as it relieves the government from the burden of managing certain products by making manufacturers internalize the cost of recycling within the product price.
- EPR is carried out bearing in mind that brand owners have the greatest control over product design and hence are in a better position to design their products in such a manner that it will reduce harmful effects on the environment as a whole.
- Extended Producers Responsibility is done through, reuse, buyback, or recycling. The producer has also the option of delegating this responsibility to a third-party which can be paid by the producer for used-product management.
- This shifts the responsibility for waste management from the government to private industries, making it easy for producers or sellers to internalise waste management and ensure the safe handling of their products.

#### More About News:

- . The **Central Pollution Control Board (CPCB) in 2023** had unearthed more than 6,00,000 fake **pollution-trading certificates** from audits at **four plastic-recycling** companies in **Gujarat, Maharashtra and Karnataka**, public documents show
- Multiple sources from the **Ministry of Environment, Forest and Climate Change** and from the plastic waste recycling industry confirmed that the **potential number of fake certificates** could be manifold as these were only four of the **2,348 plastic waste recyclers registered** with the
- Between **2022-23**, the latest year for which information is available, there were about 18,000 companies that use **plastic packaging** and were registered with the CPCB, which manages the **Extended Producer Responsibility (EPR) scheme**, as either **producers, importers or 'brand-owners'**.

- The **Plastic Waste Management Rules** mandate all companies that **use plastic packaging to register with the CPCB**. These EPR certificates, are used by thousands of companies that use **plastic packaging in some form for business operations** and are legally obliged to either ensure that a prescribed percentage of the plastic used annually is **collected and recycled**, or that they buy enough certificates to make good on their targets.
- Every tonne of plastic recycled by them **generates a certificate**.
- As per a report by the CPCB this May, nearly **7 million tonnes worth of certificates** were generated but given that companies have differing obligations, the exact number of certificates they buy from recyclers is not clear.
- While **6,00,000 fake EPRs** were bought by packaging companies as part of meeting their obligations, is unclear who bought these certificates as the break-up is not publicly available.
- The details vary, but the basic pattern in how recyclers produced fake certificates is similar. The **four recycling companies, Enviro Recycle Pvt. Ltd (Karnataka), Shakti Plastics Industries (Maharashtra), Technova Recycling India Pvt. Ltd and Asha Recycle Pvt. Ltd**, were hauled up for claiming to have generated many more EPR certificates than the installed capacity of their plants.
- The **malpractice** came to light after the **CPCB conducted physical** checks on their premises.
- Certificates generated by recycling companies are considered legitimate only if the recyclers are actually able to **sell the recycled plastic**.
- Companies were expected to file their compliance targets for 2023-24 by June this year.

#### **Plastic Waste Management (Amendment) Rules, 2022**

- The **Plastic Waste Management (Amendment) Rules, 2022**, introduce guidelines on **Extended Producer Responsibility (EPR)** for plastic packaging.
- These guidelines set mandatory targets for **EPR, recycling of plastic packaging waste, reuse of rigid plastic packaging, and the use of recycled plastic content**.

#### **No pollution control permits for 'white category' sectors now**

**Sub: Env**

**Sec: Pollution**

**Context:**

- The **Union Environment Ministry** has proposed that **industries categorized** under the '**white category**' by the **Central Pollution Control Board (CPCB)** will **no longer require prior permission** from state pollution control boards to establish and operate under the **Air Act, 1981, and Water Act, 1974**.
- These permissions, known as '**consent to establish**' (CTE) and '**consent to operate**' (CTO), are traditionally granted to regulate industries discharging pollutants.

#### **Proposed Changes to Permissions:**

- The ministry suggests **eliminating the CTE permit requirement** for projects/activities that need **prior environmental clearance (EC)**.
- **CTEs**, previously issued with specific conditions to meet pollution norms, might now be integrated with the **EC** granted by the **Ministry of Environment**.
- The ministry has released two separate draft notifications under the **Air Act, 1981, and Water Act, 1974**, inviting comments and objections within **60 days**.

#### **White Category Industries:**

- Industries such as **wind and solar power projects, air cooler assembly, and bicycle assembly** fall under the **white category**, exempting them from **CTE and CTO permits**.
- After **CPCB's recategorization** in **2016**, sectors with a **Pollution Index (PI) score up to 20** are classified as **white-category industries**.
- These industries are required to inform **state pollution control boards** about their operations through **self-declarations**.
- **The Pollution Index ranges from 0 to 100, with higher values indicating greater pollution. The criteria for categorization are as follows:**
  1. Red category: PI score of 60 and above
  2. Orange category: PI score of 41 to 59
  3. Green category: PI score of 21 to 40
  4. White category: PI score up to 20

#### **Ship carrying 1.4 million litres of oil sinks near Philippines: How oil spills impact the environment**

**Subject: Env**

## Sec: Pollution

### Context:

Major oil spills from the past point to the complex **challenges of recovery and a devastating impact on marine life.**

### Anatomy of an oil spill:

- The **environmental consequences are influenced by factors** such as the **type of oil, the volume of the spill, weather conditions, and proximity to sensitive ecosystems.**
- Due to its **lighter density compared to water**, it forms a layer that **obstructs sunlight and disrupts photosynthesis in marine plants and phytoplankton**, which are **crucial for oxygen production**. The **microscopic algae** are consumed by **fish and other marine animals**, and form the base of multiple food chains.
- Marine animals, especially those **near the surface, face immediate dangers from toxic exposure**. With **oil coating the feathers of birds**, they may lose their insulation abilities, **leading to hypothermia and drowning.**
- **Oil-Spill:**
  - An oil spill refers to **any uncontrolled release of crude oil, gasoline, fuels, or other oil by-products into the environment.**
  - Oil spills can **pollute land, air, or water.**
- **Major Causes:**
  - **Chiefly as a result of intensified petroleum exploration and production** on continental shelves and the transport of large amounts of oils in vessels.
  - Oil spills that happen in **rivers, bays and the ocean most often are caused by accidents** involving tankers, barges, pipelines, refineries, drilling rigs and storage facilities, **but also occur from recreational boats and natural disasters.**
- **Environmental Impacts:**
  - **Threat to Indigenous people:**
    - Oil pollution poses health hazards for the **indigenous population who depend on seafood.**
  - **Harmful to aquatic life:**
    - Oil on ocean surfaces is harmful to many forms of aquatic life because it **prevents sufficient amounts of sunlight from penetrating the surface**, and it also reduces the level of dissolved oxygen.
  - **Hypothermia:**
    - Crude oil ruins the insulating and waterproofing properties of feathers and fur of birds, and thus oil-coated birds and **marine mammals may die from hypothermia (decrease in body temperature to below-normal levels).**
  - **Toxic:**
    - Moreover, **ingested oil can be toxic to affected animals**, and damage their habitat and reproductive rate.
  - **Threat to Mangroves:**
    - Saltwater marshes and Mangroves frequently suffer from oil spills.
  - **Economic Impacts:**
    - **Tourism:**
      - If beaches and populated shorelines are fouled, **tourism and commerce may be severely affected.**
    - **Power Plants:**
      - The power plants and other utilities that **depend on drawing or discharging sea water are severely affected** by oil spills.
    - **Fishing**
      - Major oil spills are frequently followed by the **immediate suspension of commercial fishing.**
    - **Remedies:**
      - **Bioremediation:**
        - **Bacteria can be used to clean up oil spills in the ocean** through bioremediation. Specific bacteria can be used to **bioremediate specific contaminants, such as hydrocarbons, which are present in oil and gasoline.**
        - Using bacteria such as **Paraperlucidibaca, Cycloclasticus, Oleispira, Thalassolituus Zhongshania** and some others can help remove several classes of contaminants.

- **Containment Booms:**
  - **Floating barriers, called booms, are used to restrict the spread of oil and to allow for its recovery, removal, or dispersal.**
- **Skimmers:**
  - They are devices used for physically separating spilled oil from the water's surface.
- **Sorbents:**
  - Various sorbents (e.g., **straw, volcanic ash, and shavings of polyester-derived plastic**) that absorb the oil from the water are used.
- **Dispersing agents:**
  - These are **chemicals that contain surfactants, or compounds that act to break liquid substances** such as oil into small droplets. They accelerate its natural dispersion into the sea.
- **Related Laws in India:**
  - Presently, there is no law covering oil spill as such and its consequential environmental damage in India but India has “**the National Oil Spill Disaster Contingency Plan of 1996 (NOS-DCP)**” to handle such situations.
    - The document was issued by the Ministry of Defense in 1996; **it was last updated in March 2006.**
    - It gives the **Indian Coast Guard** the mandate to coordinate with state departments, ministries, port authorities and environmental agencies to assist in oil spill cleaning operations.
  - In 2015 India ratified the International Convention on **Civil Liability for Bunker Oil Pollution Damage, 2001** (Bunker Convention). Convention ensures adequate, prompt and effective compensation for damage caused by oil spills.
    - It was administered by the **International Maritime Organization (IMO).**

## Tiger treks across international border from Sikkim to Bhutan

### Sub: Environment

#### Sec: Protected Areas

##### Context:

- Camera trap images documented a **tiger's** journey from **Pangolakha Wildlife Sanctuary** in **Sikkim, India**, to **Samtse district** in **Bhutan**.

##### Historical Context:

- Similar **long-distance tiger movements** have been recorded in **India**, such as the **3,000-kilometer journey** to **Dnyanganga Wildlife Sanctuary** in **Maharashtra** in **2019** and a **2,000-kilometer trek** from **Tadoba-Andhari Tiger Reserve, Maharashtra** to **Odisha** in **2023**.

##### International Collaboration:

- The tiger's movement was shared during an international workshop on “**Countering Wildlife Trafficking**” held in **Bhutan** under the **South Asia Wildlife Enforcement Network (SAWEN)** in **June 2024**.

##### Significance:

- This trek highlights the **existence and importance** of **wildlife corridors** between **India and Bhutan**.
- Validates the necessity to **protect wildlife corridors** for the **conservation of tigers and other wildlife**.
- Emphasizes the **effectiveness of habitat preservation and restoration** efforts in **Sikkim**, showcasing the **region's healthy ecosystem**.

##### Pangolakha Wildlife Sanctuary:

- Established in **2002**, spans **128 square kilometres** and serves as a **crucial wildlife corridor**.
- Camera traps have documented **three tigers** in the sanctuary between **2018** and **2024**, placing **Sikkim** on the **national Tiger Conservation map**.

##### Transboundary protected areas in India:

<b>India and Nepal</b>	<ul style="list-style-type: none"> <li>• Kangchenjunga Conservation Area</li> <li>• Khangchendzonga Biosphere Reserve</li> <li>• Barsey Rhododendron Sanctuary</li> </ul>
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	<ul style="list-style-type: none"> <li>• Singalila National Park</li> </ul>
<b>India and Bhutan</b>	<ul style="list-style-type: none"> <li>• Jigme Khesar Strict Nature Reserve</li> <li>• Jaldapara National Park</li> <li>• Buxa Tiger Reserve</li> <li>• Neora Valley National Park</li> </ul>
<b>India, Bhutan and Tibet region of China</b>	<ul style="list-style-type: none"> <li>• Pangolakha Wildlife Sanctuary</li> </ul>

## Gujarat gears up for cheetah breeding centre at Banni as CZA gives green signal

**Sub: Env**

**Sec: Protected Areas**

**Context:**

- **Central Zoo Authority (CZA)** approved a **cheetah conservation breeding centre** in Gujarat's **Banni grasslands** to **reintroduce cheetahs** after decades.
- The centre will house **16 cheetahs**, aiming to restore India's wildlife heritage.

**Project Details and Funding:**

- **Banni** was chosen for its **savannah-like habitat**, similar to **East Africa**, and the **historical presence of cheetahs** until the early **1940s**.
- A **500-hectare enclosure** is created for the centre, planning to translocate cheetahs mainly from **Namibia** or **South Africa**.
- The **project** focuses on **developing and breeding cheetahs** rather than tourism.
- Efforts to improve **14,000 hectares of grasslands** and a **chinkara breeding program** aim to increase the prey base.
- **Gujarat** will become the **only Indian state** with both **Asiatic lions** and **cheetahs**.
- The **Banni project** follows the **cheetah reintroduction** at **Kuno National Park** in **Madhya Pradesh**.

**National CAMPA Approval and Regional Environment:**

- The **Gujarat government's** proposal received approval from the **National CAMPA executive committee**.
- The **absence of apex predators** like **leopards** in **Banni** provides a **favourable environment for cheetahs**.

**Banni grasslands:**

- **Banni grasslands** and **Kachchh Desert Sanctuary** cover **5000 km<sup>2</sup>**, with parts inundated during the rainy season.
- **Banni Grasslands Reserve** or **Banni grasslands** form a **belt of arid grassland ecosystem** on the **outer southern edge** of the **desert** of the **marshy salt flats of Rann of Kutch** in **Kutch District, Gujarat State, India**. They are known for their **rich wildlife and biodiversity**.
- They are currently **legally protected** under the status of a **protected or reserve forest in India**.
- The **Wildlife Institute of India (WII)** has identified this **grassland reserve** as **one of the last remaining habitats of the cheetah in India**.
- A report suggests proper management could support **up to 55 cheetahs**, considering the **region's diverse carnivores** and **seasonal bird visitors**.



## Project Tiger to displace 5.5 lakh tribals, says rights group report

**Sub: Env**

**Sec: Protected Area**

**Context:**



- A report from the **Rights and Risks Analysis Group (RRAG)** titled **'India's Tiger Reserves: Tribals Get Out, Tourists Welcome'** indicates that **Project Tiger** is set to **displace at least 5.5 lakh Scheduled Tribes and other forest dwellers**.

#### Details:

- Prior to **2021**, around **2,54,794 people** were displaced from **50 tiger reserves**, averaging **5,000 per protected area**.
- Since **2021**, the **average displacement** from **six tiger reserves** has **increased to 48,333 people**, a **967% rise**.
- The **Kumbhalgarh Wildlife Sanctuary** in **Rajasthan** is expected to see the **largest displacement** of around **1,60,000 people**.
- **Specific Reserves and Expected Displacements**
- **Nauradehi Wildlife Sanctuary** under **Durgavati Tiger Reserve, Madhya Pradesh**: 72,772 people.
- **Ranipur Tiger Reserve, Uttar Pradesh**: 45,000 people.
- **Ramgarh Vishdhari Tiger Reserve, Rajasthan**: 4,400 people.
- **Srivilliputhur-Megamalai Tiger Reserve, Tamil Nadu**: 4,000 people.
- **Dholpur-Karauli Tiger Reserve, Rajasthan**: 4,000 people.

#### Concerns Over Justification and Consent:

- Some tiger reserves, including **Sahyadri, Satkosia, Kamlang, Kawal, and Dampa**, had **no tigers** but still saw **5,670 tribal families displaced**.
- The displacement lacks justification for bypassing the **free, prior, and informed consent** required under the **Forest Rights Act** and the **Wildlife (Protection) Act of 1972**.

#### Forced Evictions and Human Rights Violations:

- The report highlights **forced evictions** involving **human rights abuses** such as the **destruction of homes, denial of access to religious and cultural sites, and coercion** through halted development programs.
- Victims face civil and political rights violations, including **extrajudicial killings, disappearances, torture, and other abuses**.
- The report mentions that between **1985 and June 2014**, many alleged poachers were killed in **Assam's Kaziranga National Park**, raising suspicions due to no forest staff being harmed.

#### Tourism vs. Tribal Rights

- The **Comptroller and Auditor General** found **unchecked commercial and ecotourism** in **core tiger reserve areas** in states like **Karnataka, Kerala, Madhya Pradesh, Maharashtra, and West Bengal**, despite the **displacement of tribal communities**.

#### Successful Coexistence in Biligiri Rangaswamy Temple Tiger Reserve

- The report notes a positive example of **coexistence between indigenous peoples and tigers** in **Karnataka's Biligiri Rangaswamy Temple Tiger Reserve**, where the **Soliga tribal people** have been allowed to live.
- The tiger population in this area **almost doubled from 35 to 68** between **2010 and 2014**, **surpassing the national growth rate**.

#### Project Tiger:

- It is a tiger conservation programme (a Centrally Sponsored Scheme of the MoEF&CC) launched in 1973 by the Government of India and administered by the National Tiger Conservation Authority (NTCA).
- **It aims at:**
  - Ensuring a viable population of the Bengal tiger ('endangered') in its natural habitats,
  - Protecting it from extinction,
  - Preserving areas of biological importance as a natural heritage that represent the diversity of ecosystems across the tiger's range in the country.

#### Background of Project Tiger:

- In **1972**, **India** enacted the **Wildlife (Protection) Act (WLPA)** and introduced new spatial fixtures within notified forests, called **'National Parks'**.
  - In the **National Parks**, the **rights of forest dwellers were removed** and vested with the State government.
  - The **WLPA** also created **'Wildlife Sanctuaries'**, where only some permitted rights could be exercised.
- The government created the **'Critical Tiger Habitat'** (under the **WLPA**) in areas of **National Parks** and **Sanctuaries** which are required to be kept as inviolate for the purposes of wildlife conservation.

## India adds 641 new animal species, 339 new plant taxa in 2023

### Sub: Environment

#### Sec: Species in news

##### New Species Discoveries in India (2023)

- In 2023, **India** added **641 new species** to its **fauna**, including **442 entirely new species** and **199 newly recorded species**.
- **India** also added **339 taxa** to its **plant database**, including **326 species** and **13 infraspecific taxa**. Of these, **171** are new to science, and **168** are **new distributional records from India**.
- **Fauna of India Checklist Portal**: Launched by the **Environment Minister**, provides exhaustive checklists of **1,04,561 animal species** across **36 phyla**, including **endemic, threatened, and scheduled species**.

##### Significant Discoveries:

###### 1. Plants:

- **Curcuma kakchingense**: A new species of **turmeric** discovered in **Kakching, Manipur**.
- **Asystasia venui**: A flowering plant discovered in the **Acharya Jagdish Chandra Bose Indian Botanic Garden, Howrah, West Bengal**.

###### 2. Animals:

- **Capra himalayensis**: Confirms that the **Himalayan Ibex** is a **distinct species** from the **Siberian Ibex**, found in **Jammu and Kashmir, Ladakh, and Himachal Pradesh**.
- **Miniopterus srinii**: A new species of **bent-winged bat** discovered in **Kodagu district, Karnataka**.

##### State-wise discoveries:

- **Kerala**: Reported the **highest number of new animal discoveries (101)**, including **74 completely new species** and **27 new records**.
- **West Bengal**: Recorded **72 new animal species**.
- **Tamil Nadu**: Reported **64 new animal species**.
- **Faunal Discoveries**:
  - **Invertebrates**: Dominated the new discoveries with **564 new species**.
  - **Vertebrates**: **77 new species**, mostly fish (**47 species**), followed by reptiles, amphibians, mammals, and birds.

##### Botanical Discoveries:

- **West Bengal**: Highest number of **new plant discoveries** with **52 new taxa**.
- **Kerala and Uttarakhand**: Also significant contributors to new plant discoveries.
  - The **hotspot regions** such as **Western Ghats, and North Eastern Regions** have contributed **14% of total discoveries**.
- **Types of Plants**: Include wild relatives of **horticultural, agricultural, medicinal, and ornamental plants** such as **begonias, impatiens, legumes, zingibers, and orchids**.

##### Annual Publications:

- **Animal Discoveries 2023**: Published by the **Zoological Survey of India**, highlighting the **dominance of insects** among invertebrates and **fishes** among vertebrates.
- **Plant Discoveries 2023**: Published by the **Botanical Survey of India**, recording discoveries in **angiosperms, pteridophytes, bryophytes, lichens, fungi, algae, and microbes**.

## What discovery of prehistoric ostrich shells in Andhra means

### Sub: Environment

#### Sec: Species in news

##### Context:

- A team of archaeologists discovered a **41,000-year-old ostrich nest (world's oldest known ostrich nest)** in **Prakasam, Andhra Pradesh**, led by **Devara Anil Kumar** from **MS University, Vadodara**.
- The **nest**, measuring **9-10 feet in width**, originally housed **9-11 eggs** but could hold up to **30-40 eggs**, providing insights into **ancient ostrich nesting habits**.

##### Understanding Megafauna:

- **Megafauna** refers to **large animals weighing over 50 kg**, categorized as **megaherbivores (plant-eaters), megacarnivores (meat-eaters), or megaomnivores (who eat both plants and meat)**.
- **Ostriches**, as **megaomnivores**, weigh **90-140 kg** and stand **7-9 feet tall**, making them significant members of **prehistoric ecosystems**.

### Implications of the Andhra Discovery on Prehistoric Megafauna:

- The **ostrich nest discovery** confirms the **presence of ostriches in southern India 41,000 years ago**.
- This contributes to ongoing research on the **extinction of megafauna in India**, linking back to discoveries dating to the **Upper Palaeolithic era** and the contributions of previous studies such as those by **S A Sali** and the **Centre for Cellular and Molecular Biology (CCMB)**.

### Insights and Research on Megafauna Extinction:

- Research indicates **megafaunal extinction** in the **Indian Subcontinent** commenced around **30,000 years ago**, coinciding with **human migration**.
- The "**co-evolution hypothesis**" suggests **human interaction** and **environmental changes** as **key factors** in **megafaunal extinction**.
- Current studies stress the **importance of robust fossil datasets** to **deepen** our understanding of this **extinction process**.

### About Ostriches:

- **Large, flightless birds** with **two living species**: the **common ostrich** (native to sub-Saharan Africa) and the **Somali ostrich** (native to the Horn of Africa).
- **Physical Characteristics**: **Heaviest and largest living birds**, weighing **63.5-145 kg**; lay the **largest eggs of any land animal**.
  - **Fastest birds on land**, capable of running at **70 km/h (43.5 mph)**.
- **Farming and Industry**: Farmed globally, with major industries in the **Philippines** and **Namibia**. **South Africa**, particularly **Oudtshoorn**, produces about **70% of global ostrich products**. **Ostrich leather** is **valuable**, and feathers are used for **ceremonial headgear**. **Ostrich eggs** have been utilized by humans for millennia.
- **Taxonomy**: Belong to the **genus Struthio** in the **order Struthioniformes**, part of the **infra-class Palaeognathae**, which includes other **flightless birds** like **emus, rheas, cassowaries, kiwis**, and the **extinct elephant birds and moas**.
- **Historical Range**: The common ostrich was once **native** to the **Arabian Peninsula** and was present in **Asia** as far east as **China** and **Mongolia** during the **Late Pleistocene** and possibly into the **Holocene**.

### Rewilding, artificial insemination, population study; Rs 56 crore approved for next phase of Bustard conservation

#### Sub: Environment

#### Sec: Species in news

#### Context:

- The **Ministry of Environment, Forest and Climate Change (MoEFCC)** approved **Rs 56 crore** for the next phase of **Great Indian Bustard (GIB)** and **Lesser Florican** conservation.

#### Details:

- The plan includes **habitat development, in-situ conservation, completion of the conservation breeding centre**, and releasing **captive-bred birds**.
- In June, the **National CAMPA executive committee** recommended the **Wildlife Institute of India's (WII)** proposal for scaling up the project from **2024-2033**, including two components.

#### Conservation programme:

- The conservation programme has been running since **2016** for the long-term recovery of **GIB** and **Lesser Florican**, with around **140 GIBs** and **fewer than 1,000 Lesser Floricans** currently **surviving in the wild**.
  - The **first component** targets the completion of the **conservation breeding centre (CBC)** in **Jaisalmer**, development of the **Sorsan Lesser Florican facility**, and preparatory work for releasing **captive-bred birds**.
  - The **second component** involves **in-situ conservation of GIBs** in other states such as **Gujarat, Maharashtra, Karnataka, Andhra Pradesh, and Madhya Pradesh**, with a budget of **Rs 43.68 crore**.
- **WII** will also undertake **GIB population estimation** and **rangewide population estimation** of the **Lesser Florican** between **2024-2026**.
- Until rewilding begins in **2027**, **WII** plans to collect two to four **GIB eggs** and **six to ten Lesser Florican eggs** each **year**.
- Release sites for **captive-bred Bustards** will be identified, with training and soft release enclosures developed.
- The **2024-2029 phase** will target **artificial insemination techniques** as a backup to **captive-breeding conservation**, with collaboration from the **Abu Dhabi-based International Fund for Houbara Conservation**.
- **Artificial insemination** will aid **genetic management and diversity**, potentially using **cryopreservation** to manage the population from a **genetic perspective**.

- **GIB** and **Lesser Florican** populations have **declined** due to **hunting, habitat loss, egg predation, and overhead power lines**.
- Conservation efforts began with the **National Bustard Recovery Plan** in **2013** and the **Bustard Recovery Project** in **2016**, including a **2018 tripartite agreement** between **MoEFCC, Rajasthan forest department, and WII**.
- **Two GIB conservation breeding centres** and **one Lesser Florican centre** are **operational** in **Rajasthan's Sam, Ramdevra, and Sorsan**.

#### About Great Indian Bustard (GIB):

- The Great Indian Bustard is one of the heaviest flying birds in the world.
- **Scientific Name:** *Ardeotis nigriceps*
- **Habitat:** Dry grasslands and scrublands on the Indian subcontinent; its largest populations are found in the Indian state of Rajasthan.
- **Distribution:**
  - India, effectively the only home of the bustards, now harbours less than 150 individuals in five States.
  - Today, its population is confined mostly to Rajasthan and Gujarat. Small population also occurs in Maharashtra, Karnataka and Andhra Pradesh.
  - It is the State bird of Rajasthan.
- **Protection Status**
  - Critically Endangered on the IUCN Red List
  - In Appendix I of CITES,
  - In Schedule I of the Indian Wildlife (Protection) Act, 1972.

#### About Lesser Florican (*Sypheotides indicus*):

- Also known as the **likh** or **kharmore** is the **smallest in the bustard family**.
- **Habitat:** The bird is endemic to the Indian Subcontinent, where it is found in tall grasslands.
  - In **India**, the bird is observed in **Rajasthan, Madhya Pradesh, Gujarat** and some other regions during the **monsoon season** when it breeds and later disappears with its chicks to unknown places.
- **Characteristics:** The **male** has a **contrasting black and white** breeding plumage and distinctive elongated head feathers that extend behind the neck.
  - The **only similar species** is the **Bengal florican** (*Houbarobsis bengalensis*) which is **larger** and **lacks the white throat, collar** and elongated plumes.
- **Threats:** The bird is threatened both by **hunting** and **habitat degradation**.
  - Further, the species is **highly endangered** and has been **officially hunted to extinction** in some parts of its range, such as **Pakistan**.
- **Conservation status:**
  - **IUCN Status:** Critically Endangered
  - **Wildlife Protection Act, 1972:** Schedule I
  - **CITES:** Appendix II

#### Brahmaputra's lone female gharial's long wait for a mate could end soon

##### Sub: Environment

##### Sec: Species in news

**Context:** A lone female has been spotted for more than three years in a stretch of the river within the Kaziranga National Park and Tiger Reserve

- A lone female gharial has temporarily overshadowed the one-horned rhino in eastern **Assam's Kaziranga National Park and Tiger Reserve**.
- Wildlife officials and specialists are not sure how this gharial came to inhabit a stretch of the **Brahmaputra River** within the **Kaziranga National Park and Tiger Reserve**. But they are certain that the reptile, presumed almost an adult by its size, is the key to repopulating the river with gharials.
- It is believed to have been wiped out from the Brahmaputra River system in the 1950s, although there were claims of sightings in the 1990s.
- The female gharial was first spotted in 2021 within the Biswanath Wildlife Division of the 1,307.49 sq. km. Kaziranga. Water bodies, primarily a 107-km stretch of the Brahmaputra, comprise more than 80% of this division measuring 401 sq. km.
- The same female gharial, now 2.55 metres in length, was recorded twice basking 500 metres apart in one of the three priority habits chosen during a 10-day survey of aquatic reptiles along the Brahmaputra in January.

## Survey findings

- The survey report submitted to the Forest Department in June said 990 freshwater turtles belonging to five species — **Assam roofed turtle, Indian tent turtle, Brown roofed turtle, Indian or Gangetic softshell turtle, and Peacock softshell turtle** — and more than 80 other major aquatic faunal species were recorded in the stretch of the Brahmaputra largely within the Biswanath Wildlife Division.
- The other aquatic animals included a mammal that shares the gharial's Ganga connection — the elusive **Gangetic River dolphin (*Platanista gangetica*)**.

## Reintroduction proposal

- One of the 10 recommendations in the report was the “high-priority” reintroduction of gharials in the Brahmaputra landscape, especially within the Biswanath Division, considering the “suitability of habitats in supporting the survival of this species in the long run”.
- Wildlife experts eye reintroduction of gharials from Kukrail gharial breeding centre near Lucknow in Uttar Pradesh to support breeding in ideal Kaziranga conditions.

## About Gharial:

- It is a **fresh-water crocodile** which lives in **deep fast-flowing rivers**.
- **Features:** Compared to **alligators and crocodiles**, a **Gharial** has a **very long and narrow snout (instead of a broad snout)**.
- The female gharial was found to be the only one of its kind moving between a “sandy shoreline” and a “sand bar with a shoreline water depth of 4.5 metres”.
- **Distribution:**
  - Globally Gharial is found **only in India and Nepal**.
  - In India their major population occur in **three tributaries of the Ganga River**: the **Chambal** and the **Girwa Rivers in India** and the **Rapti-Naryani River in Nepal**.
  - The **Gharial reserves of India** are located in **three States – Uttar Pradesh, Madhya Pradesh and Rajasthan**.
- **Conservation status:**
  - **IUCN:** Critically endangered.
  - **Wildlife (Protection) Act, 1972:** Schedule I
  - **CITES:** Appendix I
- **Conservation Initiatives:**
  - Breeding Centres of Kukrail Gharial Rehabilitation Centre in Lucknow, Uttar Pradesh.
  - National Chambal Sanctuary (Madhya Pradesh).

## Spotted hyenas outcompeting leopards in Tanzanian park with human help, says study

### Sub: Environment

### Sec: Species in news

### Context:

- Danish researchers from the University of Copenhagen conducted a study in **Tanzania's Udzungwa Mountains**, using camera traps to **observe inter-species dynamics** between **spotted hyenas** and **leopards**.

### Key Findings of the study:

- **Spotted hyenas (*Crocuta crocuta*)**, living in **social groups (clans or cackles)**, are outcompeting **leopards**, who are solitary animals.
- **Female leopards** (approx. 20-43 kg.) are about **half the size of male leopards** (approx. 51-72 kg). **Hyenas** are in the **middle** in terms of **weight** (approx. 48-56 kg)
- **Hyenas** engage in **kleptoparasitism**, stealing kills from other predators, including leopards.
- **Global leopard populations** are **declining**, whereas **hyena populations** are **increasing**.

### Human Influence:

- **Hyenas** are tolerated by locals as they **scavenge on dead or sick livestock** and usually **do not attack people**.
- **Hyenas** benefit from **human presence**, using **humans** as **shields against leopards**, and **thrive in areas with human activity**.
- **Male leopards** **avoid human-dominated areas**, while **female leopards** become **diurnal** to **avoid nocturnal hyenas**.
- **Leopards** are unpopular among locals due to **livestock hunting** and **human attacks**, leading to their retreat from **human-dominated areas**.
- **Leopards** retreat far from **humans** due to their unpopularity, which affects their access to food resources.

- **Ecological Impact:**

- The **increasing success of hyenas** and the **decline of leopards** could **disrupt the ecosystem balance**.
- Without **leopards** to **keep their populations in check**, **monkey species** could **spike**, altering the entire ecosystem.

#### Spotted Hyenas:

- Also known as the laughing hyena.
- Native to sub-Saharan Africa.
- It is the **only placental mammalian species** where **females** have a **pseudo-penis** and **lack an external vaginal opening**.
- Highly successful animal, being the most common large carnivore in Africa.
- It is listed as being of least concern by the IUCN.

#### Squalus hima

##### Sub: Environment

##### Sec: Species in news

##### Why in news?

Scientists from Zoological Survey of India (ZSI) recently discovered a **new species of deep-water dogfish shark** named *Squalus hima* from Sakthikulangara fishing harbour in Kerala along the Arabian Sea.

##### About *Squalus hima*:

- *Squalus* is a genus of dogfish sharks in the family **Squalidae**, commonly known as **spurdogs**. They are characterised by smooth dorsal fin spines.
- **Physical Features:** angular short snout, a small mouth almost as wide as the snout, a first dorsal fin origin behind the pectoral fins, and a body *without any spots*.
- Shark species belonging to the genus *Squalus* and *Centrophorus* are exploited for their liver oil, which contains high levels of **squalene** (or squalane when processed for products).
- Squalene is in high demand in the **pharmaceutical industry**, particularly for making **high-end cosmetics and anti-cancerous products**.
- On the Indian coast, two species of *Squalus* are found from the southwest coast of India.

*Squalus hima* **differs from similar species like *S. mitsukurii* and *S. lalannei*** by the number of precaudal vertebrae, total vertebrae, teeth count, trunk & head heights, fin structure, and fin colour.

##### About Zoological Survey of India (ZSI)

- Established in 1916, it is India's apex organization on animal taxonomy.
- Headquartered in Kolkata, with 16 regional offices.
- It has been declared as a designated repository for the National Zoological Collection as per **Section 39 of the National Biodiversity Act, 2002**.
- ZSI publishes the Red Data Book on Indian Animals.

#### World's rarest whale may have washed up on beach in New Zealand

##### Subject: Environment

##### Sec: species in news

##### Context:

The **spade-toothed whales** are the **world's rarest**, with **no live sightings** ever recorded. **No one knows how many there are**, what they **eat**, or even where they **live in the vast expanse of the southern Pacific Ocean**.

##### Why in news:

- The **five-meter-long creature**, a type of **beaked whale**, was identified after it washed ashore on **Otago Beach** by its **colour patterns** and the **shape of its skull, beak**, and
- If the **cetacean** is confirmed to be the **elusive spade-toothed whale**, it would be the **first specimen found in a state that would permit scientists to dissect it**.
- Only **six other spade-toothed whales** have ever been pinpointed, and those found intact on **New Zealand's North Island beaches** had been **buried before DNA testing could verify their identification**.
- The beached whale was quickly **transported to cold storage**, and researchers will work with **local Maori iwi (tribes)** to plan how it will be examined.
- **New Zealand's Indigenous people** consider **whales a taonga - a sacred treasure of cultural significance**.



- In April, **Pacific Indigenous leaders signed a treaty** recognising **whales** as “**legal persons,**” although such a declaration is not reflected in the laws of participating nations.
- **Southern Pacific Ocean, home to some of the world’s deepest ocean trenches.**

#### Spade-toothed Whale:

- **Conservation status: Data deficient**
- **CITES: Appendix II**
- **Found:** New Zealand and Chile
- **Discovered: Pitt Island, New Zealand in 1872**
- **Scientific name:** Mesoplodon traversii
- **Family:** Ziphiidae

#### Cetacean

- Cetacea is an **infraorder of aquatic mammals** belonging to the order **Artiodactyla** that includes **whales, dolphins and porpoises.**

#### Maori iwi (tribes):

- **Location:** New Zealand
- **Language:** Te Reo Maori
- **Art:** Maori art
- Indigenous tribe
- Rich and vibrant culture
- **Kaitiaki (guardians) of the natural resources and strive to maintain** a harmonious relationship with the

#### Pacific Indigenous leaders signed a treaty:

- **Whales and dolphins** have been officially recognised as “**legal persons**” in a new treaty formed by **Pacific Indigenous leaders** from the **Cook Islands, French Polynesia, Aotearoa (New Zealand) and Tonga.**
- A treaty that translates as the **ocean declaration of Māori,** promotes the **protection and survival** of these animals in a holistic way.

#### Indian leopard suspected to have decreased by 24.5% over last 3 generations: IUCN

##### Sub: Env

#### Sec: Species in news

#### Decline of the Indian Leopard:

- The **Indian leopard (Panthera pardus fusca) population** has potentially **declined by 24.5%** over the last three generations, according to the **IUCN.**

#### Details:

- The **decline** is attributed to **range loss and exploitation,** though some areas show **positive population trends.**
- Despite an **increase** in the known range, this may be due to more intensive surveys in previously unstudied areas.
- Data on the population size and trends of the Indian leopard remain poor.

#### Threats to the Indian Leopard:

- **Poaching** remains a significant threat, with an estimated **four leopards poached weekly** over the past decade for illegal wildlife trade.
- **Human-leopard conflict** and a **decline in prey base** are other major threats.
- In some regions, **decreases in wild prey** are **negatively impacting leopard populations.**
- **Leopard population trends** in **India's non-tiger states** and **non-forested habitats** are not well known and may be declining.

#### Global Leopard Population Trends:

- Other leopard subspecies are also showing **declining trends,** with a **global decline of over 30%** in the last three generations.
- **Factors contributing** to the **decline** include **habitat fragmentation, forest clearing, prey reductions from bushmeat trade, illegal harvest for skins, and human-wildlife conflict.**
- **Leopards** have disappeared from **North Africa** and are **critically endangered** in regions such as **Indochina, Arabia, and North China.**

#### Conservation Efforts and Assessments:

- Some regions, like the **Caucasus, Russian Far East, and North East China**, have seen **increases in leopard populations** due to **improved survey methods, expanded ranges, or intensive conservation efforts**.
- The **Indochinese leopard (*Panthera pardus delacouri*)**, **Arabian leopard (*Panthera pardus nimr*)** and **North China Leopard (*Panthera pardus orientalis*)**- though not individually assessed) have been assessed to be **Critically Endangered**.
- The **Persian and Javan leopards** are considered **endangered**, while the **African and Sri Lankan leopards** are assessed as **vulnerable**.

### CITES defines guidelines on the trade of rosewood species

**Sub: Env**

**Sec: Species in news**

**Context:**

- The **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)** has issued **guidelines for sustainable harvest and trade of rosewood specimens**.

**Details:**

- CITES oversees the **trade of rosewood species in genera Dalbergia, Afzelia, Khaya, and Pterocarpus**, currently listed in **Appendix II**, indicating **they are not immediately threatened but could be at risk without regulation**.
- Focus on **capacity-building for 13 high-priority and 14 medium-priority species**.
- **Pterocarpus erinaceus (African rosewood)** is highly threatened due to **over-exploitation and illegal trade**.
- Trade suspension recommendations are in place for **range states of Pterocarpus erinaceus**.

**Non-Detriment Findings (NDF) and Capacity Building:**

- **Non-Detriment Findings (NDFs)** are a cornerstone sustainability requirement for continuing the **global trade in CITES-listed species** that supports livelihoods in countries where it grows and industries in production and destination countries.
- **NDFs** are essential for **supporting livelihoods and industries while protecting species from extinction**.
- **Evidence-based NDFs** are crucial for sustainable global trade in **CITES-listed species**.

**Report and Data Utilization:**

- CITES published a report on **CITES-listed species traded under rosewood**, using data from **TRAFFIC experts**.
- The report includes locations of existing rosewood **NDFs, species vulnerability, and conservation priority**.
- Information is vital for creating **NDFs and assessing exportable timber volume** while ensuring species survival.

**About Rosewood Tree:**

- **Rosewood:** A commercial term encompassing a wide range of **tropical hardwoods** in the **Fabaceae (Leguminosae) family**.
- **Distribution:** Native to **Southeast Asia, Papua New Guinea, the Solomon Islands, Sabah, Philippines, Indonesia, and Malaysia**.

**Indian Rosewood:**

- **Dalbergia sissoo (North Indian rosewood):** Fast-growing, hardy, deciduous tree native to the Himalayas' foothills.
- **Distribution:** From Afghanistan to Bihar, India.
- **Habitat:** Primarily along riverbanks above 200 m elevation, up to 1,400 m.
- **Dalbergia latifolia (East Indian Rosewood):** Known as East Indian Rosewood, Black Rosewood, Bombay Blackwood, Indonesian Rosewood, and Malabar Rosewood.
- **Habitat:** Tropical dry and moist deciduous forests, also in plains.
- **Distribution:** India, Nepal, Andaman Islands, Malay Peninsula, Indonesia, Himalayas, China, Malaysia.
- **Uses:** Furniture, musical instruments, decorative items, and veneers.
- **Conservation status:** Listed in Appendix II of the CITES list.

### Teen who died of Nipah in Kerala had local fruit from neighbourhood where fruit bats thrive

**Sub: Env**

**Sec: Species in news**

**Context:** A day after a 14-year-old boy in Malappuram succumbed to the Nipah virus, Kerala health department Monday confirmed that he had consumed **hog plum fruit from his neighbourhood, where the presence of fruit bats, known as reservoir of the zoonotic virus, was confirmed**.

**Flying fox bats:**

- **Pteropus** (suborder Yinpterochiroptera) is a genus of **megabats** which are among the **largest bats in the world**.
- They are commonly known as **fruit bats** or **flying foxes**, among other colloquial names.
- They **live in South Asia, Southeast Asia, Australia, East Africa**, and some **oceanic islands** in the **Indian and Pacific Oceans**.
- **Flying foxes** eat fruit and other plant matter, and occasionally consume insects as well.
- They locate resources with their keen sense of smell. **Most, but not all, are nocturnal**. They navigate with keen eyesight, as **they cannot echolocate**.
- There are at least 60 extant species in the genus.
- They are generally considered a **vermin** as they raid orchards.
- It had a similar official status under the **Schedule V** of the **Wildlife (Protection) Act of 1972** until it was put on the **Schedule II list**, entailing a higher degree of protection.
- **Ecological role:**
  - It is a **keystone species**.
    - A **keystone species** is one that has a disproportionately large effect on its natural environment relative to its abundance, impacting many other organisms in an ecosystem and helping to determine the types and numbers of other species in an ecological community.
  - It causes **seed dispersals** of many plants in tropical systems.
  - Vigilance behaviour.
  - Being external roosters, the **flying fox** is exposed to predators and disturbances apart from environmental indicators such as heat and light.
- **Threats:**
  - The biggest threat to the **flying fox** is from **humans**.
  - **Hunting for meat and medicine** and probable threats like the **felling of roost trees** have contributed to the dramatic decrease in the population of the species.

### Are melanistic leopards increasing in Karnataka, given frequent sightings? Sign of habitat loss, say experts

**Sub: Env**

**Sec: Species in news**

**Context:**

- Frequent sightings of **melanistic leopards**, also known as '**black panthers**,' have been reported in **Karnataka**, raising curiosity among wildlife enthusiasts.
- **Melanism** is a **genetic condition** causing **black skin and spots**, found in about **11%** of the **Indian leopard subspecies**.

**Population and Habitat Concerns:**

- The **increase in sightings** does not necessarily indicate a population rise; it may reflect **habitat loss**.
- **Karnataka's leopard population** is **stable** at around **2,500**, with approximately **11%** being melanistic.
- The **overall leopard population** in **India** has **grown** from **8,000** in **2014** to **12,852** in **2018**, with significant **populations** in **Madhya Pradesh, Karnataka, and Maharashtra**.

**Habitat Loss and Human Encroachment:**

- **Leopards** in **Karnataka** face significant **habitat loss** due to **urban expansion, deforestation, and agricultural activities**.
- This **habitat encroachment** forces **leopards** into **human-dominated areas**, increasing the likelihood of sightings and potential conflicts.

**Melanistic Leopard/Black Panther:**

- **Leopards (Panthera Pardus)** are **either light-coloured** (pale yellow to deep gold or tawny) with **black rosettes** or **black fur**.
- The **melanistic leopards**, which are **either all-black or very dark in colouration**, are known as **black panthers**. It is a colour variant of **spotted Indian leopards**, reported from densely forested areas of south India.
- **Black coat colouration** is attributed to the **expression of recessive alleles** in **leopards** and **dominant alleles** in **jaguars**. In each species, a certain combination of alleles stimulates the production of large amounts of the dark pigment **melanin (Melanism)** in the animal's fur and skin.
- The appearance of a **black coat** may be influenced by other factors, such as the **angle of incident light** and the **animal's life stage**.
- It is as **shy** as a **normal leopard** and **very difficult to detect**.

- **Habitat:**
  - They are mainly in **Southwestern China, Burma, Nepal, Southern India, Indonesia, and the southern part of Malaysia.**
  - In **India**, they can be **spotted** in the states of **Karnataka, Tamil Nadu, Kerala, Maharashtra etc.**
- **Threats:**
  - Habitat loss.
  - Collision with vehicles.
  - Diseases.
  - Human encroachment.
  - Poaching.
- **Protection Status:**
  - IUCN Red List: Vulnerable.
  - CITES: Appendix I.
  - Wildlife (Protection) Act, 1972: Schedule I.

### **Charles Darwin's frog: Endemic Andaman species breeding in unnatural sites due to habitat loss & competition for limited resources**

**Sub: Env**

**Sec: Species in news**

**Context:**

- The **Charles Darwin frog, *Minervarya charlesdarwini***, found **only** in the **Andaman Islands**, exhibits **unique mating behavior**, involving **upside-down mating** and **egg-laying**.
- Researchers from **Harvard University** and the **University of Delhi** studied this **species over three consecutive monsoons**, observing this **distinct behaviour in tree cavities** where frogs mate and lay eggs with their bodies above the water.

**Adaptation to Environmental Changes**

- The species has adapted to **environmental changes** by using **human waste**, such as **plastic and metal containers**, as **breeding sites** due to the **loss and fragmentation of forest habitats**.
- This **behaviour** has **significant conservation implications**, as the **frog** is listed as **vulnerable** on the **IUCN Red List**.
- **Male Charles Darwin frogs** display **aggressive behaviours** during **mating**, including **complex calls, physical fights, and attempts to disrupt mating pairs**, which rarely result in fatalities.

**Conservation Concerns and Recommendations:**

- The use of trash for breeding is concerning, highlighting the need for conservation efforts to protect natural breeding sites and maintain the species' survival.
- The research emphasizes the impact of **human disturbances on species** like the **Charles Darwin frog**, urging for the **preservation of its specialized microhabitats**.
- The **frog** belongs to the **Dicroglossidae family**, a group with over **220 species**, and its unique adaptations underscore the diverse reproductive behaviours still unexplored in biodiversity hotspots.

### **BSI documents wild flowers along the ancient Silk Route in Sikkim and Kalimpong**

**Subject: Environment**

**Sec: Msc**

**Context:**

**More About News:**

A recent publication by the Botanical Survey of India (BSI) documents the flora and landscapes of one of the oldest trading routes of south Asia — the Silk Route, meandering through Kalimpong and Sikkim in the eastern Himalayas and going to Lhasa in Tibet.

The book documents 1,137 flowering plants and throws light on the connection between botany and the politics of the region.

**The book A Southern Silk Route:**

Sikkim and Kalimpong Wild Flowers and Landscapes not only documents 1,137 flowering plants, a host of butterflies, insects, birds and mammals but also the historical significance of the route and the link between botany and politics of the region.

**Species Found Along this Route:**

- The key flowering plants documented in the publication and found along the silk route are **Windamere palm (Trachycarpus latisectus)** a wild palm species facing the threat of extinction with only a few trees left in Kalimpong region.
- State tree of Sikkim — **Rhododendron niveum**, endemic to the eastern Himalayas and found in **Kyongnosla Alpine Sanctuary** along the **Silk Route**.
- The Impatiens **sikkimensis**, a threatened balsam species, and **Daphne ludlowii**, which was used to make paper for Buddhist manuscripts, are also among the important flora found along the route.
- Scientists involved in the publication have documented several such species along the 210-km route from Siliguri in Darjeeling to Kalimpong, Nathu La and Gangtok.
- The road which was used in ancient times as the Silk Route. The trade between medieval Bengal and Lhasa was carried out along multiple routes. The shortest of all these routes from India to Lhasa was the one through Sikkim and Kalimpong.

#### Historical highlights:

The publication also throws light on the history of botany in the country by highlighting the contributions of British botanist J.D. Hooker. He studied the flora of Sikkim as early as in 1848 and his major contributions include the discovery of 32 species of rhododendrons in the State.

The publication, running over 600 pages, contains many photographs of the plants, birds, butterflies and mammals in the region, including Sikkim's State bird and animal — the threatened red panda and the blood pheasant, respectively. Historical photographs of people and places also find a place in the book.

#### Protected Areas:

There are five protected areas along the Silk Route:

- **Mahananda Wildlife Sanctuary**
- **Neora Valley National Park**
- **Pangolakha Wildlife Sanctuary**
- **Kyongnosla Alpine Sanctuary**
- **Fambong Lho Wildlife Sanctuary**

Four big cats — **tiger, leopard, snow leopard and clouded leopard** — inhabit the areas along the route.

#### Tourism opportunities:

- The promotion of the Silk Route will lead to new adventures in tourism, particularly adventure tourism, in the State.
- The touch of history of the Silk Route will boost the potential for people taking up adventure tourism.
- Tourism is one of the primary economic activities of Sikkim and the State has been taking steps to promote adventure tourism, particularly trekking, mountaineering and biking.

#### Historical Background:

- The Silk Route that connected **Lhasa (Tibet) to Kalimpong** was in use even a few decades ago until the Chinese invasion of Tibet.
- It was commonly used by traders travelling to Tibet through Jelep-la ('la' stands for mountain pass) as an **overnight base**.
- The route started from Kalimpong and passed through **Pedong, Aritar, Dzuluk and Jelepla to Chumbi valley in Tibet**.
- Trade between the Old Silk Route at Nathu La reopened in July 2006 after relations between China and India improved. However, the trade that involved about 200 people on both sides of the border has not resumed after the pandemic.

## Geography

### Team India stranded in Barbados due to Hurricane Beryl: What are hurricanes, their types?

**Sub: Geography**

**Sec: Climatology**

**Context:**

- The Indian cricket team, fresh from their ICC World T20 Cup win, is stranded in **Barbados** due to **Hurricane Beryl**.
- The team was scheduled to leave for New York on July 1, connecting through Dubai to reach India, but the hurricane has closed the **Grantley Adams International Airport** indefinitely.

#### Hurricane Beryl:

- **Beryl** is the **earliest category 4 storm** of the **Atlantic hurricane season**, with winds of at least **130 mph (209 km/h)**.
- It is impacting the **Windward Islands**, including **Barbados, Grenada, and Trinidad and Tobago**.

- The **hurricane** is expected to cause **violent winds** and **flash flooding**, with **life-threatening conditions** forecasted for July 1.
- Warnings have been issued for several islands, including **Barbados** and **St. Lucia**, while **Dominica** and **Trinidad** are under a **tropical storm watch**.
- Schools are suspended indefinitely, some being used as hurricane shelters.
- The **Barbados Water Authority** has shut down the water supply, while the power company has not planned electricity cuts.
- **Beryl** is the **strongest storm** to hit the Windward Islands since **Hurricane Ivan** in **2004**.

#### Hurricane Formation:

- **Hurricanes** form over **warm ocean waters** near the **equator**, fueled by **warm, moist air**.
- **Rising warm air** creates **low-pressure areas**, drawing in surrounding air, which also warms and rises.
- The process creates **clouds** and **wind systems** that grow and spin, forming a hurricane.
- **Hurricanes rotate counterclockwise** in the **northern hemisphere** and **clockwise** in the **southern hemisphere** due to **Earth's rotation**.
- **The most influential factors are:**
  1. A source of warm, moist air derived from tropical oceans with sea surface temperatures normally in the region of, or in excess, of 27 °C;
  2. Winds near the ocean surface blowing from different directions converging and causing air to rise and storm clouds to form;
  3. Winds which do not vary greatly with height – known as low wind shear. This allows the storm clouds to rise vertically to high levels;
  4. Sufficient distance from the equator to provide spin or twist.
- **La Nina**, a weather pattern most commonly found in the Southern Pacific region also causes cyclones depending on the weather conditions at the time.

#### Increasing Severity of Hurricanes:

- As **hurricanes** make **landfall**, they **weaken** due to **losing ocean moisture**.
- A study in Nature suggests that **warmer sea surface temperatures** slow **hurricane decay**, **increasing their impact**.
- The **2020 Atlantic Hurricane** season saw **29 named storms**, a record high.

#### Hurricanes vs. Tropical Storms:

- **Hurricanes, typhoons, and cyclones** are **all tropical cyclones**, named based on their location.
- Tropical cyclones are called by different names in different regions given below:
  - Hurricane – Atlantic
  - Typhoon – Western Pacific and the South China Sea
  - Willy-Willies – Western Australia
  - Cyclone – Indian Ocean

#### Freddy's fury: WMO confirms cyclone Freddy's record 36-day lifespan

**Sub: Geography**

**Sec: Climatology**

#### Cyclone Freddy: Record-Breaking Tropical Cyclone:

- **Longest-lived tropical cyclone** on record (Surpassed **hurricane John**), lasting **36 days**.
- It is the **second longest-travelled tropical cyclone** on record.
  - The **longest distance** travelled by a **tropical cyclone** was **13,159 km** by **Hurricane John** in the **North Pacific Ocean** in **1994**.
- **Additional Records:**
  - Rapid intensification **seven times** (highest on record).
  - Accumulated cyclone energy equalling an **entire North Atlantic hurricane season**.
- **Regions Affected:** Southeast Africa (Madagascar, Mozambique, Malawi).
- **Impact:** Fierce winds, intense rainfall, destructive storm surges.
- **Path and Landfall:**
- **Formation:** Off the **northwestern coast of Australia** on February 4, 2023.
- **Landfall:** First hit **Madagascar** on February 21, 2023.



- **Dissipation:** Over **Malawi** on March 14, 2023.
- **Distance Travelled:** Second longest on record, **12,785 km**.
- **Energy Source:** Warm sea surface waters and subsurface seawater.
- **Forecasting Challenges:** Rapid intensification complicated weather models and early warnings.

#### Impact and Damage

- **Financial Cost:** \$481 million in damages.
- **Displacement:** 1.4 million people across **six African countries**.
  - **Malawi:** 659,000 displaced, highest since 2009.

#### Importance of Early Warnings

- **Early Warning Systems:** Helped mitigate higher death tolls through timely alerts and evacuations.
- **UN Initiative:** Emphasized the importance of early warnings for all to tackle extreme weather and climate change risks.

### Odisha resorts to palm tree planting to combat lightning deaths this year

#### Sub: Geography

#### Sec: Climatology

#### Odisha's Palm Tree Initiative:

- **Odisha** plans to plant **1.9 million palm trees** and restrict the **cutting of existing ones** to **reduce lightning casualties**.
- **Palm trees** act as **natural conductors** during **lightning strikes**, **preventing loss of lives**.
- The **decision to plant and protect palm trees** was made in **September 2023**.
- **Odisha** is **one of India's worst-affected states** by **lightning strikes** during the pre-monsoon and monsoon periods.

#### Implementation and Financial Details:

- Special Relief Commissioner Satyabrata Sahu urged **large-scale palm tree plantations** in **reserve forests and vulnerable districts**.
- The department will plant around **1.9 million palm trees** across the state in **2024-25**, spending around Rs 7 crore.
- Initial **restrictions on felling palm trees** were withdrawn due to public demands, leading to their near extinction in rural areas.

#### Impact and Statistics:

- On average, **300 people die annually** in **Odisha** due to **lightning**, with **2,058 deaths** from **2018-19** to **2022-23**.
- **Lightning strikes** claim nearly **2,500 human lives annually** in **India**.
- Most victims are farmers, cattle herders, fishers, forest dwellers, and labourers working outdoors.
- **Lightning** was declared a **state-specific disaster** in **Odisha** in **2015**, with the government providing **Rs 4 lakh ex-gratia** to families of the deceased.

### Record-high temperatures in western US due to 'heat domes': What is the phenomenon?

#### Sub: Geo

#### Sec: Climatology

- Places across the southwest and eastern parts of the United States **recorded temperatures as warm** as those seen in late June or early July, and the **unusual warming was caused by a phenomenon known as 'heat domes'**
- 'Heat domes' are **natural phenomena** that have also been **associated with unusually warm periods in India, Bangladesh, China** and some other Asian countries.
- This season's first heat dome set off heatwaves in as many as 48 states in the US and fears of wildfires loom large.
- Over the years, heat domes have **created some of the most fatal heat waves** in North America, among other regions. **Creating records for some of the highest temperatures ever recorded in the continent**, these waves have caused thousands of deaths.
- Stopping heat domes from forming altogether is not possible, as they are a natural weather phenomenon. But as the **threat of climate change continues to creep up**, **heat domes are getting more intense**.

#### Heat Dome:

- A heat dome is a **type of high-pressure system** that forms **over a large area** in the atmosphere, and **causes extremely hot and dry weather conditions**. The system **traps hot air and prevents it from flowing to rise and cool**.
- This air then becomes **compressed and heats up**, leading to a **dome-shaped area** of hot air that can persist for several days or even weeks.
- Heat domes can **cause dangerous heat waves causing the temperatures to shoot up**.

- **Due to climate change**, heat domes have **not only become more frequent but also a lot more intense**. The rising temperatures and changes in weather patterns are creating conditions that are assisting their formation.

#### Causes of Heat Dome:

- **Change in Atmospheric Pressure:** Heat waves begin when **high pressure** in the atmosphere moves in and pushes warm air toward the ground.
  - High-pressure systems often **bring clear skies, which means there is less reflection of sunlight and more absorption of heat**. Locations with a lot of land and relatively dry air, such as **plains and deserts, serve as a favourable condition** for heat domes to form as well.
- **Change in Ocean Temperature:**
  - In the process known as **convection**, the **gradient causes more warm air, heated by the ocean surface**, to rise over the ocean surface.
  - As **prevailing winds move the hot air east**, the **northern shifts of the jet stream trap the air and move it toward land**, where it sinks, resulting in heat waves.
- **Climate Change:** Climate change has **led to warmer background temperatures, exacerbating the high-pressure system**.

#### Impact of Heat Dome:

- **Heat-related illnesses:** Heat domes can cause a spike in heat-related illnesses such as **heat exhaustion, heat cramps, and heatstroke**. Vulnerable populations such as the elderly, children, and those with pre-existing medical conditions are at a higher risk.
- **Wildfires:** The **high temperatures and dry conditions** caused by heat domes can increase the risk of wildfires. The heat can also **exacerbate the spread of fires**.
- **Crop damage:** Heat domes can **cause crop damage** due to high temperatures and drought conditions. This can **lead to lower crop yields** and economic losses for farmers.
- **Infrastructure damage:** High temperatures can cause damage to infrastructure such as **roads, buildings, and power lines**.
- **Water shortages:** Heat domes can lead to **drought conditions**, which can cause water shortages and impact water supplies for both people and wildlife.
- **Air pollution:** High temperatures can lead to **increased levels of air pollution**, which can exacerbate respiratory problems and other health issues.

#### Combating Heat Dome:

- **Reducing greenhouse emissions:** **Transitioning to renewable energy sources, improving energy efficiency and promoting sustainable transportation**, can be measures in achieving a reduction of greenhouse gas emissions, as it is critical to mitigating the impacts of heat domes in long terms.
- **Investing in green infrastructure:** Cities can invest in green infrastructure, such as **parks, green roofs, and tree planting**, which can help reduce the urban heat island effect and provide cooling benefits.
- **Implementing building codes and standards:** Building codes and standards can help ensure that new buildings are **designed to withstand extreme heat and maintain indoor comfort during heat waves**.
- **Reducing heat-trapping surfaces:** Cities can take steps to reduce the amount of heat-trapping surfaces, **such as asphalt and concrete**, which can exacerbate the urban heat island effect.
- **Enhancing public education and outreach:** Educating the public about the risks of extreme heat and how to **stay safe during heat waves** can help reduce the incidence of heat-related illness and mortality.

#### What is the relationship between heat domes and the jet stream?

- The **heat dome's formation** is related to the behaviour of the **jet stream** — an area of fast-moving air high in the atmosphere.
  - The **jet stream** is believed to have a **wave-like pattern** that keeps moving from north to south and then north again.
  - When these waves get bigger and elongated, they move slowly and sometimes can become stationary.
- This is when a **high-pressure system gets stuck and leads to the occurrence of a heat dome**.
- With the rising temperatures, it is expected that the jet stream will become more wavy and will have larger deviations, causing more frequent extreme heat events.

#### About Zika Virus:

- **Zika is a viral infection, which is spread by the Aedes aegypti mosquito**, which also spreads **dengue and chikungunya**.
- Zika virus is a **mosquito-borne** pathogen belonging to the flavivirus family of viruses which also includes dengue.

- It is a contagious disease where infected people can transmit Zika virus sexually.
- **The incubation period (the time from exposure to symptoms) of Zika virus disease is estimated to be 3-14 days.**
- It was **first identified in Uganda in 1947 in monkeys, Zika was detected in humans five years later.**
- In India, Zika virus was first recorded in 1952-53. The latest major outbreak was in 2018, when 80 cases were reported in Rajasthan.
- It results into microcephaly, especially when pregnant women are infected.
- Clinical symptoms of Zika infection in many cases could be mild and indistinguishable from other infectious diseases including dengue.
- For pregnant women, the Zika virus poses a significant risk as it can be transmitted from mother to child, potentially leading to microcephaly in the offspring.

## Environmentalists alarmed as Himachal witnesses shift in snowfall patterns

**Sub: Geo**

**Sec: Climatology**

**Context:**

- **Himachal Pradesh** is experiencing a **reduction in snow cover** and a **shift in snowfall patterns** from **winter** to **early summer**, raising concerns about **climate variability** in the **Himalayas**.
- The **decrease in snow** during **peak winter months** (December and January) could affect **summer water availability**, as **winter snow** sustains **river discharge**.

**Study Findings on Snow Cover:**

- A study by the **Centre on Climate Change of Himachal Pradesh Council for Science Technology-Environment (HIMCOSTE)** shows a **12.72% decrease in snow-covered areas** across **major river basins (Satluj, Ravi, Chenab, and Beas)** in **2023-24** compared to **2022-23**.
- **Early winter months** (October-November) saw a **decrease in snow cover**, except for a **slight increase** in the **Ravi basin**. The peak winter months (December-January) showed a **negative trend**, with the worst affected being January.
- However, **February** and **March** saw an **increase in snow cover** in **all basins**, and **April** experienced **fresh snowfall**, **increasing the snow-covered area**.

**Concerns and Implications:**

- The late **snowfall** extending into **April** may **not be beneficial**, as **rising temperatures** could **accelerate melting**, affecting **river discharge** during **peak summer**.
- Environmentalists and scientists note a worrying trend of **reduced snowfall in peak winter months** and a **shift toward late winter or early summer**, impacting **hydropower, water sources, and ecosystems**.

## Will the Hosur airport become a reality?

**Sub: Geography**

**Sec: Economic geo**

**Context:**

- **Tamil Nadu Chief Minister M.K. Stalin** plans to set up an **international airport** on 2,000 acres in **Hosur**.

**Significance of Hosur:**

- **Capacity:** The airport will handle three crore passengers annually.
- **Location:** Hosur is in **Krishnagiri district**, on the border of **Tamil Nadu** and **Karnataka**. Hosur is **40 km** from **Bengaluru**.
- **Population Growth:** Ranked **13th globally** for **fastest population growth** in **2021**.
- **Industrial Hub:** Home to companies like **Tata Electronics, TVS, Ashok Leyland, Titan, and Rolls-Royce (IAMPL)**.
- **Sectors:** Strong in **auto** and **electric vehicle manufacturing, advanced manufacturing, logistics, electronics, floriculture, and horticulture**.
- **MSMEs:** Approximately **3,000 MSMEs** in engineering fabrication, tooling, and polishing.
- The **State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT)**, the State government's **nodal agency to promote industrial infrastructure**, has established **industrial parks** in **Hosur** in two phases spread over 2,093 acres.
- **Water Supply:** SIPCOT is setting up a **20 MLD Tertiary Treatment Reverse Osmosis plant**, expected by September.

**Guidelines and Procedures:**

- **DGCA Guidelines:** No **greenfield airport** within **150 km** of an **existing civilian airport** without an **impact assessment** and **government approval**.
- In **2017**, approval was granted for an airport in **Jewar**, 72 kms from IGI Airport, Delhi, to decongest **Indira Gandhi International (IGI) airport**.
- **Union Cabinet Approval:** Required for **DGCA** to **grant a licence**.

#### **Impact and Benefits:**

- Airport project to enhance connectivity and stimulate economic growth in Hosur and neighbouring districts (**Dharmapuri** and **Salem**).
- Foster growth between **Tamil Nadu** and **Karnataka**, creating a **twin-city ecosystem** with **Bengaluru**.

#### **Previous Plan:**

- **Hosur airport** is owned by **Taneja Aerospace and Aviation Limited**.
- In **2023**, a bid for the **Chennai-Hosur-Chennai route** was not awarded under the **UDAN scheme** due to the **BIAL** agreement.
- **Hosur Airport** was **removed** from **future UDAN bidding documents**.

#### **Challenges**

- **Negotiations:** DMK government needs to negotiate with the Centre for norm relaxation, regulatory, and environmental clearances.
- **Infrastructure:** Supporting infrastructure for the airport needs to be developed.
- **Hurdles:** Concession agreement with **Bangalore International Airport Ltd (BIAL)** restricts new airports within 150 km until 2033.

### **Coal Ministry Reviews Status of Captive/Commercial Coal Mines' Production**

#### **Sub: Geography**

#### **Sec: Eco Geo**

#### **Context:**

- As of 30th June, 2024, **54 captive/commercial coal mines** are under production out of which 32 mines are allocated to the power sector, 12 to non-regulated sector and 10 mines are allocated for sale of coal.

#### **More on news:**

- 65 non-operational coal blocks are in various stages of obtaining regulatory clearances.
- These blocks are distributed across nine states: **Arunachal Pradesh, Assam, Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, and West Bengal**.

#### **Types of Coal Mining:**

##### **Commercial Coal Mining:**

- Commercial mining allows the **private sector** to mine coal commercially without placing any end-use restrictions.
- The **private firms** have the option of either **gasification of the coal or exporting it**.
- They can also use it in their own end-use plants or sell them in the markets.

##### **Captive Coal Mines:**

- Under the **Coal Mines (Nationalization) Act, 1973** coal mining was **exclusively** reserved for the **public sector**.
- **Amendment to Mines Act 1973, was brought in 1976 provided two exceptions to the mines policy:**
  - (i) captive mining by private companies engaged in production of iron and steel .
  - (ii) sub-lease for coal mining to private parties in isolated small pockets not amenable to economic development and not requiring rail transport, were allowed.
- Captive mines are the **mines that are owned by companies**.
- The coal or mineral produced from these mines is for the **exclusive use of the owner company of the mines**.
- The **company cannot sell coal or minerals outside**.
- **Captive mining of coal** is allowed to companies engaged in
  - (i) **Production of iron & Steel**
  - (ii) **Generation of Power**
  - (iii) **Manufacture of Cement**.
- Government provisions for granting **mining plans and mining leases** are contained in the **Mines & Minerals Development and Regulation Act, 1957** and **Mineral concession Rules 1960**.

##### **Non- Captive Mines:**

- Non-captive Mines are mines from which the produced coals can be used for its **own consumption and as well as for selling it.**
- The **MMDR Act, 1957** empowers the **central government to reserve any mine as a captive mine** which is utilized for a **specific purpose only.**
- The **Mines and Minerals (Development and Regulation) Amendment Bill, 2023** bill removes the **distinction between captive and non-captive mines.**
- The mines will not be limited to just a specific purpose/industry/sector.

### How is India's hunt for critical minerals going?

**Sub: Geo**

**Sec: Eco Geo**

**Context:**

Why are **lithium, copper, cobalt, graphite** and others essential for **the economy's green transition**? In which **States have reserves** been found? Why have there been **hiccups in the auction** process? What lies ahead? Which **country dominates global supplies**?

**More About News:**

- The **Centre declared the winning bidders** for mining rights in **six blocks** of critical minerals, including **graphite, phosphorite and lithium**, for which India largely relies on
- **Copper, lithium, nickel, cobalt** are known as **critical minerals**, as they along with some **rare earth elements**, are essential for the world's ongoing efforts to switch to **greener and cleaner energy.**
- The **International Energy Agency (IEA)**, **lithium** demand rose by **30% in 2023**, followed by **nickel, cobalt, graphite** and rare earth elements which saw an **8% to 15% growth**, with the aggregate value of such minerals pegged at \$325 billion.
- By **2040**, the demand for **copper is expected to rise 50%, double for nickel, cobalt and rare earth elements, quadruple for graphite and eightfold for lithium**, which is crucial for
- **95% of India's copper** requirements are **met through imports.** **China** is a **key supplier** or processor of many of these items.

**What is being done to spur production?**

- **India holds 11% of the world's deposits of ilmenite**, the **main source of titanium dioxide** used in many applications.
- The discovery of **Lithium Reserves** in the **Union Territory of Jammu and Kashmir (J&K)** while the **Geological Survey of India (GSI)** was exploring the **State's terrain** for
- Announced as the **first discovery of lithium** in the
- Central government amended the **Mines and Minerals (Development and Regulation) Act, 1957 in August 2023** to enable it to grant mining concessions for **24 critical** and strategic minerals.
- By November, the first auctions of 20 critical mineral blocks, with the lithium block identified in **J&K's Reasi district** on the list, were launched, followed by **two more tranches with 18 more blocks** offered this February and March.
- The Mines Ministry on June 24, announced **six winners** from the **maiden auction tranche** for **three blocks in Odisha, and one each in Tamil Nadu, P, and Chhattisgarh.** The Ministry has initiated a **fourth tranche**, which includes **10 blocks** that are being offered for the second time.

**Why are some blocks not finding takers?**

- Among the **first attempt blocks** offered in the latest auction, **two phosphorite blocks** along with a **glauconite block** are in **Chhattisgarh**, while **two blocks** each are up for grabs in **P. (phosphorite and rare earth elements), Karnataka (phosphate and nickel), and Rajasthan (potash and halite).**
- A **graphite block** is being auctioned in **Jharkhand and Arunachal Pradesh**, with **five additional blocks of graphite, tungsten and vanadium** offered in the **northeastern State** for the second time.
- The **'second attempt' blocks** also include a **tungsten reserve in Tamil Nadu's Madurai district, a cobalt and manganese block in Karnataka's Shimoga, and a chromium and nickel block in Sindhudurg, Maharashtra.**

**Reasons for Low Interest Among Miners:**

- **Lack of adequate data** on the **potential reserves** buried within them.
- **Technology challenges** a
- The **lithium block in J&K** has **clay deposits**, and the technology for the **mineral's extraction** from clay remains untested globally.

**When is domestic production likely to begin?**

- **"India's manufacturing** is thus likely to remain exposed to **potential future supply** shocks of these minerals till then."

- Apart from **spurring exploration** and attracting more miners, the Centre is looking to acquire **overseas assets from key resource-rich regions** as a **parallel measure to bolster mineral security**.
- The **first such mine**, for **lithium brine**, was acquired in **Argentina** this year by **Khanij Bidesh India Limited, a joint venture of NALCO, Hindustan Copper, and Mineral Exploration Company**. While it scouts for more assets, **India** has also joined the **S-led Mineral Security Partnership**, a block consisting of large buyers and sellers of critical minerals.

#### Applications:

- **Electric vehicles:** cobalt, lanthanum, lithium
- **Fuel cells:** platinum, palladium, rhodium
- **Wind energy technologies:** neodymium, dysprosium, terbium
- **Aviation sector:** titanium
- **Photovoltaic solar technologies:** cadmium, indium, gallium

#### AI to the rescue: Cutting-edge tech to help cotton farmers fight pink bollworm

##### Sub: Geography

Sec: Eco geo

#### Context:

- **Pink bollworm (PBW)** infestations affect and damage **cotton crops** severely.

#### AI-Powered “Pheromone Traps” Project:

- The **Central Institute for Cotton Research (CICR)** under the **Indian Council of Agricultural Research (ICAR)** is conducting a pilot project using **AI** for **real-time pest monitoring**.
- **AI-powered pheromone traps** are being used to help farmers make timely pest management decisions, a first in India for any crop.

#### Project Focus and Expansion:

- The pilot focuses on **three major cotton-growing districts** in **Punjab: Muktsar, Bhatinda, and Mansa**, with six fields from each district.
- If successful, the project will be implemented in **Rajasthan** and **Haryana**.

#### Pheromone Traps and AI Technology:

- **Traditional pheromone traps** use **gossyplure** to **attract male moths**, but regular monitoring by farmers is challenging.
- The **new digital approach** provides **hourly crop updates** via mobile phones using a **camera** in the **trap** that **transmits images to a remote server for analysis**.
- A **machine learning algorithm** identifies and counts **PBW**s, providing **real-time pest alert information** to **ICAR scientists, farmers, and agriculture extension officers**.
- **Benefits and Efficiency:**
  - The **AI system** enables **timely pest management advice, ensuring efficient control and keeping damage below economic threshold levels**.
  - Farmers receive **scientific data-based advisories** and can **monitor crops remotely**.
- **Broader Impact and Campaigns:**
  - Data from the **AI system** will be shared with agriculture state department officials, taluka officials, and village-level extension functionaries.
  - This information will be used to create **mass campaigns** and **distribute advisories to the farmer database**.

#### About Pink Bollworm:

- The **pink bollworm (PBW)**, or **Pectinophora gossypiella**, is a **moth** that is a **major pest to cotton** in many regions of the world.
- It is known as “**Pinky**” because the **larvae develop pink bands** as they mature.
- The larvae are **small white caterpillars** with **eight pairs of legs** and **pink bands** along their backs.
- The **PBW lays eggs on cotton bolls**, which **hatch into larvae** that **burrow into the bolls and squares, destroying the seeds and staining the lint**.
- **PBW Infestation:**
  - **PBW** destroys parts of the developing **cotton fruit**, significantly threatening **cotton crops** and **farmers' livelihoods**.
  - In recent years, severe **PBW attacks** have affected the **cotton crop** in **Punjab, Haryana, and Rajasthan**, even impacting **genetically modified Bt Cotton (Bollgard II seed)**.



### Cotton crop:

- Cotton is a **Kharif crop** that requires **6 to 8 months to mature**.
- **Temperature:** Between 21-30°C (Requires a hot, sunny climate with a long **frost-free period of 210 days**)
- **Rainfall:** Around 50-100 cm (Most productive in warm and humid conditions).
- **Soil Requirements:** Cotton can be planted in a wide range of soils, from medium to heavy, but black cotton soil is the most ideal for cotton cultivation.
- It can tolerate a pH range of 5.5 to 8.5 but is sensitive to waterlogging.

### Chouhan asks scientists to carry out research on natural farming, without lowering production

#### Sub: Geo

#### Sec: Eco Geo

#### Context:

- **Agriculture Minister Shivraj Singh Chouhan** urged **Indian Council of Agricultural Research (ICAR)** scientists to research **natural farming to maintain crop production levels** while **protecting soil health for future generations**, on the occasion of **ICAR Foundation Day**

#### Focus on High-Yielding Varieties:

- There is a **decline in acreage** under **soybean** and **sunflower** due to **farmers' reluctance to grow low-productivity crops**.
- **Livestock and fisheries** contribute **35%** to the **GDP**, with the potential to **exceed 50%** with proper attention.

#### Soybean crop:

<b>About</b>	<ul style="list-style-type: none"><li>• Soybean called golden beans are belongs to the legume family.</li><li>• It is native to East Asia. It is a rich source of Protein and also an excellent source of fibre.</li><li>• Oil extracted from soybean contain a small amount of saturated fat. In Punjab, it plays an important role in crop diversification.</li></ul>
<b>Geographical Condition required for Soya Bean</b>	<ul style="list-style-type: none"><li>• Soybean grows well in warm and moist climates.</li><li>• A temperature of 26 to 30°C appears to be optimum for most of the varieties.</li><li>• Soil temperatures of 15.5°C or above favour rapid germination and vigorous seedling growth.</li><li>• A lower temperature tends to delay the flowering.</li></ul>
<b>Major Produces across the Globe and India</b>	<ul style="list-style-type: none"><li>• In <b>2020, Brazil</b> overtook the <b>United States</b> as the leading soybean-producing country.</li><li>• <b>Madhya Pradesh</b> followed by <b>Maharashtra</b>.</li></ul>

#### Sunflower crop:

<b>About</b>	<ul style="list-style-type: none"><li>• Important oilseed crop in India.</li><li>• A major source of vegetable oil in the world.</li><li>• Used for a variety of cooking purposes. Sunflower seed contains about <b>48- 53% edible oil</b>.</li></ul>
<b>Production</b>	<ul style="list-style-type: none"><li>• <b>Ukraine</b> is the <b>largest producer</b> of sunflowers. (<b>Ukraine</b> and <b>Russia</b> together account for about <b>60% of the global sunflower oil production and exports</b>).</li><li>• In <b>India</b>, Sunflower is grown mainly in <b>Karnataka, Maharashtra, Andhra Pradesh, Punjab, and Haryana</b>.</li><li>• <b>India</b> is the <b>largest importer of sunflower oil</b> with imports of about 2.8 million tonnes.</li></ul>
<b>Cultivation</b>	<ul style="list-style-type: none"><li>• Sunflower is a <b>photo-insensitive crop</b>, therefore, it can be grown successfully in any season viz., <b>Kharif, Rabi</b> and <b>spring</b> throughout India.</li><li>• The crop requires a <b>cool climate</b> during <b>germination</b> and <b>seedling growth</b>.</li><li>• It requires <b>warm weather</b> from the <b>seedling stage up to the flowering stage</b> and <b>warm and sunny days</b> from <b>flowering to maturity</b>.</li><li>• The amount of <b>linoleic acid decreases with high temperatures</b> at maturity.</li><li>• Sunflower is a crop with <b>medium water requirement</b>.</li></ul>
<b>Soil</b>	<ul style="list-style-type: none"><li>• Sunflowers can be grown on a wide range of soils and tolerate a <b>moderate pH range</b> and some salinity.</li></ul>

- It thrives best on **deep loam soils** with **good drainage** and **irrigation facilities**.
- The **optimum range** of **soil pH** for this crop is **6.5 to 8.5**.
- It performs better than **groundnut** in **heavy black cotton soils** of **Karnataka** and **Tamil Nadu**.

## The Green Revolution in maize

**Sub: Geo**

**Sec: Eco geo**

**Context:**

- **India achieved self-sufficiency in wheat and rice**, thanks to **high-yielding varieties** bred by institutions such as **Mexico-based CIMMYT** (International Maize and Wheat Improvement Center) and **IARI**, under scientists like **Norman Borlaug** and **M S Swaminathan**.

### Maize Revolution in India

- **Maize production in India** has **more than tripled** from **11.5 million tonnes** in **1999-2000** to **over 35 million tonnes** in **2023-24**, with **average yields rising** from **1.8 to 3.3 tonnes per hectare**.
- **Only a fifth of maize** is used for **human consumption**, with **60%** serving as **feed for poultry and livestock**.
- **Maize is a key energy source** in **broiler, egg-layer, and cattle feeds**, with **broiler feed containing 55-65% maize**.

### India's first 'Waxy' Maize hybrid- Pusa Waxy Maize Hybrid-1:

- **14-15%** of **maize** is used **industrially for starch** and **1-3%** of other **simple carbohydrates** (sucrose, glucose and fructose), which has applications in various industries, and for **ethanol production** for **blending with petrol**.
- **IARI** has bred **India's first "waxy" maize hybrid** with **high amylopectin starch content**, better suited for **ethanol production**.
- The new **Pusa Waxy Maize Hybrid-1(AQWH-4)** has a **higher starch recovery rate**, enhancing **ethanol yield**.
- **Normal maize starch** has **30% amylose** and **70% amylopectin**. The **starch** from **IARI's waxy maize hybrid (AQWH-4)** has **93.9% amylopectin**.
  - **Softness** ensures **better grinding of the grains** fed into the mill for making flour.
  - **Granules with higher amylopectin** are also easily accessible by **alpha-amylase**, the **enzyme** that **hydrolyses** or **breaks down the starch** into **smaller glucose units**.
  - The **glucose** is, then, **fermented into ethanol using yeast**.
- Field trials are underway in collaboration with the **Uttar Pradesh Distillers' Association**.

### CIMMYT's Contribution:

- **CIMMYT** has opened a **maize-doubled haploid facility** in **Karnataka**, producing **genetically pure inbred lines** to speed up **maize breeding**.
- This facility produced **29,622 maize DH lines** last year, focusing on **high-yielding lines tolerant to various stresses**.
  - **CIMMYT (International Maize and Wheat Improvement Center)** is one of the **15 CGIAR centres** based in **Mexico**.
  - **CIMMYT** is known for hosting the **world's largest maize and wheat genebank**.

### Private Sector's Role:

- The **Green Revolution in maize** has been led by the **private sector**, with **private sector-bred hybrids** accounting for over **80% of India's maize area**.
- **CIMMYT** collaborates with both **public institutions** and **private seed companies** to **improve maize varieties**.

### Maize

- **Temperature:** Between **21-27°C**
- **Rainfall:** High rainfall.
- **Soil Type:** Old alluvial soil.
- **Top Maize Producing States:** **Karnataka, Madhya Pradesh, Bihar, Tamil Nadu, Telangana, Maharashtra** and **Andhra Pradesh**.
- **As per the FAO** (Food and Agriculture Organisation) data, **India** was the **fifth** largest producer of Maize in 2020.
- It is used both as **food** and **fodder**.
- The use of modern inputs such as **High-Yielding Variety seeds, fertilisers** and **irrigation** have contributed to the increasing production of maize.
- **Technology Mission on Maize** is one of the government's initiatives for maize.

- MSP is provided by the GOI for **Maize crops**.

## **If India gives land, we will work together to produce palm oil here, says visiting Malaysian Minister**

**Sub: Geo**

**Sec: Eco geo**

**Context:**

- **India and Malaysia agreed to enhance cooperation in oil palm cultivation and palm oil production and trade.**

**Details:**

- The ministers discussed **India's National Mission on Edible Oils** and plans to **increase oil palm cultivation**.
- **Malaysia** offered its **expertise in research, seed supply, and partnership management to support India's efforts**.
- The versatile uses of palm oil include **edible oil and biofuel**.
- **Malaysia exports 14.8 million tonnes of palm oil**, with **3 million tonnes** going to **India**, its **biggest partner**.
- **Malaysia ensures its palm oil meets sustainability standards, using no new land for cultivation and halting deforestation.**

**Oil Palm Production in India:**

- **Oil Palm (Elaeis guineensis)**, originated in **West Africa** is comparatively a **new crop in India** and has the **highest vegetable oil-yielding capability per ha**.
- It produces **two distinct oils**, i.e., **palm oil** and **palm kernel oil**, which are used for culinary as well as industrial purposes.
- **Andhra Pradesh, Telangana, and Kerala** are **major Oil palm-growing States** and account for **98%** of total production.
- **Karnataka, Tamil Nadu, Odisha, Gujarat, and Mizoram** also have sizable areas under Oil palm cultivation.

**National Mission on Edible Oils- Oil Palm (NMEO-OP):**

- Launched by the Government of India in **August 2021**, NMEO-OP targets a **substantial increase in oil palm cultivation and crude palm oil production**.
- It is a **Centrally Sponsored Scheme** with a special focus on the **Northeast region** and the **Andaman and Nicobar Islands**, with a focus on **increasing the area and productivity of oilseeds and Oil Palm**.
- **Scheme Outlay:** A financial outlay of **Rs. 11,040 crores** has been made for the scheme, out of which **Rs. 8,844 crore** is the **Government of India share** and **Rs. 2,196 crore** is the **State share**, and this includes the **viability gap funding** also.
- **Targets:**
  - To **increase the area of oil palm to 10 lakh hectares** from **3.5 lakh ha** during **2019-20** by **2025-26** (an additional 6.50 lakh ha).
  - To **increase the Crude Palm Oil production from 0.27 lakh tonnes** during **2019-20** to **11.20 lakh tonnes** by **2025-26**.
  - Increase consumer awareness to maintain a consumption level of **19.00 kg/person/annum** till **2025-26**.
- The **State Department of Agriculture, State Department of Horticulture, Central University, ICAR-Institutions, CDDs, SAUs, KVKS, Central Agencies/Cooperatives, Oil palm processors/ Associations, DD Kisan, AIR, DD, TV channels** will be the implementing **stakeholders** of the NMEO-Oil palm.
- **Features:** The salient features of NMEO-OP include assistance for planting material, inputs for intercropping upto gestation period of 4 years and for maintenance, the establishment of seed gardens, nurseries, micro irrigation, bore well/pump set/water harvesting structure, vermicompost units, solar pumps, harvesting tools, custom hiring centre cum harvester Groups, farmers and officers training, and for replanting of old oil palm gardens etc.

## **Coal India bags first critical mineral asset**

**Subject: Geo**

**Sec: Eco Geo**

**Context:**

- The **first critical mineral asset, a graphite block, in Madhya Pradesh**.
- **Owning a graphite asset will give Coal India an advantage in powering green energy transition momentum to an extent, according to a statement.**
- **Coal India Ltd (CIL)** has successfully opened its account in domestic critical mineral asset emerging as the **preferred bidder for Khattali Chotti graphite block in Alirajpur district of Madhya Pradesh**.
- The company accounts for **more than 80 per cent of domestic coal output**.
- The country imports about **69 per cent of its graphite needs - natural, synthetic and end-use products**.

- Graphite has its **utility as an anode material in lithium-ion battery manufacturing** due to its **relatively low cost and energy density**.
- With the **electric vehicle market and energy storage systems fast gaining traction**, where **lithium-ion cells are used**, **graphite has a big market**.
- The **market size for graphite is projected to take a big leap with the absolute demand projected to shoot up at the rate of 25-27 per cent by FY35 from the current level**.

**CIL acquired the composite licence for the 599.76-hectare graphite block:**

- Firm is the **first major player in the critical mineral auction**.
- It won the **bid by quoting a mining premium of 150.05% of the mineral despatch value**.
- Coal India is **also actively pursuing lithium blocks in Chile, Australia, and various African nations**

**Graphite:**

- It is an **opaque, non-metallic carbon polymorph** that is blackish silver in colour and metallic to dull in sheen.
- Since it **resembles metal lead**, it is also known colloquially as **black lead or plumbago**.
- **Formation:** It is formed by the **metamorphosis of sediments containing carbonaceous material**.
- **Molecular structure**
  - It consists of a **ring of six carbon atoms closely bonded together hexagonally** in widely spaced layers.
  - The **bonds within the layers are strong**, but the **bonds between the layers are less in number and therefore weaker**.
- **Properties:**
  - It is a naturally occurring form of **crystalline carbon and is a stable form of carbon**.
  - It is **extremely soft**, cleaves with **very light pressure**, and has a **very low specific gravity**.
  - In contrast, it is **extremely resistant to heat** and nearly **inert in contact with almost any other material**. These extreme properties give it a wide range of uses in **metallurgy and manufacturing**.
- **Applications:** It is used in pencils, lubricants, crucibles, foundry facings, polishes, arc lamps, batteries, brushes for electric motors, and cores of nuclear reactors.
- Globally it is **mined extensively in China, India, Brazil, North Korea, and Canada**.

**Andhra Pradesh to get ₹15,000 crore for capital Amaravati**

**Subject: GEO**

**Sec: Eco geo**

**Context:**

Centre has committed to **develop A.P.'s capital Amaravati** and would **develop the multipurpose irrigation project Polavaram** which is supposed to be the lifeline of the State.

**More on News:**

- **Centre of the dismal financial situation** in the State owing to irregularities of the past government and sought **substantial financial support for the Amaravati Capital, Polavaram project** and other infrastructural development in the State.
- To develop the **multipurpose irrigation project Polavaram which is supposed to be the lifeline of the State**.

**Industrial Corridor:**

- An industrial corridor is basically a **corridor comprising of multi-modal transport services** that would pass through the states as main artery.
  - **Freight cargo from industrial and National Investment and Manufacturing Zones (NIMZs) located upto a distance of 100-150 km on both sides** of this main artery are brought to the industrial corridor via rail and road feeder links that **provides last mile connectivity**.
  - This will **lower costs of logistics and enable firms to focus on their areas of core competence**.
- Industrial corridors offer **effective integration between industry and infrastructure**, leading to overall economic and social development.
- **Promotion of industrial development, funds for essential infrastructure such as roads, water, power and railways**.

**Polavaram Project:**

- It is an **under-construction multi-purpose irrigation project** on the **Godavari River in the Eluru District and East Godavari District in Andhra Pradesh**.
- The project has been accorded **National project status** by the **Union Government of India**.
- **Objectives:**

- Development of **Irrigation, Hydropower and drinking water facilities in East Godavari, Vishakhapatnam, West Godavari and Krishna districts of Andhra Pradesh.**
- The project envisages the generation of **960 MW of hydropower, drinking water supply to a population of 28.50 lacks in 611 villages**
- The **ultimate irrigation potential of the project is 4.368 lakh ha.**
- The project implements the **Godavari-Krishna link under the Interlinking of Rivers project.**

#### Chennai-Vizag industrial corridor:

- The **Kopparthy Industrial Node**, the corridor between **Visakhapatnam and Chennai** will be developed on **priority basis.**
- East Coast Economic Corridor (ECEC) covers **West Bengal, Odisha, Andhra Pradesh and Tamil Nadu.** **Vizag to Chennai segment of this Corridor has been taken as phase-1.**
  - **Vizag-Chennai Industrial Corridor (VCIC)** is the **first coastal economic corridor** in the country.
  - It covers **more than 800 km of Andhra Pradesh's coastline** and is aligned with the **Golden Quadrilateral.** It also plays a critical role in the **"Act East Policy"** of India.

#### India's illegal coal mining problem

**Sub: Geo**

**Sec: Eco geo**

**Context:**

- On July 13, **three workers died of asphyxiation** in an **illegal coal mine** in **Surendranagar district, Gujarat.**

#### **Background and Legal Framework**

- **Coal in India** was **nationalized** in two phases: **coking coal in 1971-72** and **non-coking coal in 1973.**
- The **Coal Mines (Nationalisation) Act, 1973,** regulates **coal mining eligibility in India.**
- **Illegal mining** is a **law-and-order issue,** under **state jurisdiction,** putting the responsibility on **state governments.**
- **Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act):** This central legislation governs the mining sector, detailing processes for acquiring mining licenses and regulating mining activities. It empowers state governments to frame rules to prevent illegal mining.

#### **Factors Contributing to Illegal Coal Mining**

- **India's high demand for coal,** which **fuels 55% of its energy needs,** often **exceeds the legal supply,** encouraging **illegal mining.**
- **Poverty and unemployment** in **coal-rich areas** drive locals to **illegal mining.**
- **Weak enforcement of mining regulations,** especially in **remote areas,** contributes to the problem.
- **"Coal mafias"** and alleged political support complicate efforts to curb illegal mining.
- Techniques like **surface mining** and **rat-hole mining** are often used in **illegal operations,** bypassing scientific and safer methods required for **legal mining.**

#### **Worker Safety Issues in Illegal Mines**

- The **primary cause of worker deaths** in **illegal mines** is the **lack of safety equipment and protocols.**
- Workers face **respiratory risks** from **coal dust** and **toxic gases** like **carbon monoxide.**
- **Illegal mines** often lack **structural support,** making them **prone to cave-ins** and other hazards.
- Many workers are **untrained** and **unprepared** for the risks, with limited access to emergency response facilities.

#### **Challenges in Addressing Illegal Coal Mining:**

- The **Indian government** faces challenges in **curbing illegal coal mining** due to a mix of **economic, social, political, and regulatory factors.**
- The issue has existed since before the **nationalization of coal** and continues in **coal-rich** or **abandoned mining areas.**
- The complexity of the **legal framework governing mining** can lead to bureaucratic hurdles and inefficiencies, allowing illegal mining to persist.

#### Why Australia has banned mining in one of the world's largest uranium deposits

**Sub: Geo**

**Sec: Eco geo**

#### **Ban on Mining at Jabiluka Site:**

- **Australia** announced plans to **ban mining** at the **Jabiluka site,** which is surrounded by **Kakadu National Park** and contains one of the **world's largest high-grade uranium deposits.**



- The **park** would be extended to include the **Jabiluka site**, aligning with the wishes of the Mirarr people, the **Indigenous custodians of the land**.

#### Indigenous and Archaeological Significance:

- The **Mirarr people** have long opposed mining at **Jabiluka**, and in **2017**, archaeologists discovered **ancient stone tools** near the site, dating back tens of thousands of years.

#### Jabiluka mine:

- **Jabiluka** is a pair of **uranium deposits** and mine development in the **Northern Territory of Australia** that was to have been built on **land** belonging to the **Mirarr clan of Aboriginal people**.
- The mine site is surrounded by, but not part of, the **World Heritage-listed Kakadu National Park**.

#### Political Context and Legal History:

- The **ban** comes amid the **opposition conservative Coalition's** proposal to **build nuclear power plants**, challenging **Australia's 26-year nuclear ban**.
- The **Jabiluka site** has been a contentious issue since the discovery of **uranium** in the early **1970s**, with significant protests, including a blockade by the **Mirarr people** and the band **Midnight Oil** in the **late 1990s**.
- The decision follows international condemnation of Rio Tinto's destruction of the **46,000-year-old Juukan Gorge rock shelters** in **2020**.

### Surprising 'dark oxygen' discovery could ensnarl deep-sea mining

#### Sub: Geo

#### Sec: Eco geo

#### Context:

- A study published in *Nature Geoscience* on July 22 revealed an **unknown process producing oxygen** in the **deep ocean**, where **photosynthesis is not possible**.
- This discovery suggests the **existence of previously unknown ecosystems** in the **abyssal zone**, a **deep-sea region**.

#### Abyssal zone:

- The **abyssal zone** or **abyssopelagic zone** is a layer of the **pelagic zone** of the **ocean**.
- The word abyss comes from the Greek word ἄβυσσος (*ábussos*), meaning "**bottomless**".
- At depths of **4,000–6,000 m** (13,000–20,000 ft), this zone remains in **perpetual darkness**.
- It covers **83%** of the **total area** of the ocean and **60%** of **Earth's surface**.
- The **abyssal zone** has **temperatures** around **2–3 °C (36–37 °F)** through the **large majority of its mass**. The water pressure can reach up to **76 MPa** (750 atm; 11,000 psi).

#### Presence of oxygen in Abyssal zone:

- When the scientists were conducting experiments at a **depth of 4 km**, they noticed the **oxygen concentration** in some places **rapidly increased instead of decreasing**.
- This underwater region is called the **abyssal zone**. It receives **too little sunlight for photosynthesis to be feasible**. Instead, **life-forms** here get oxygen from water carried in by a global circulation called the **'Great Conveyor Belt'**.
- Still, the **amount of oxygen is low** and without any local production, the device should have measured the **oxygen levels dropping** as small animals consumed it.
- But the scientists found the opposite: it **increased**, sometimes **tripling in just two days**.

#### Possible Mechanism: Polymetallic Nodules:

- **Polymetallic nodules**, rich in **iron, manganese, copper, and nickel**, may play a role in producing **oxygen** by **splitting water molecules through electric charges**.
- These **nodules** are found on the **ocean floor**, particularly in the **Clarion-Clipperton Zone** off **Mexico's west coast**.
  - Covering an area **larger than India**, the **Zone** is considered to have the **world's highest concentration of polymetallic nodules**, including **6 billion tonnes** of **manganese** and **more than 200 million tonnes** each of **copper and nickel**.

#### India's Involvement and Deep-Sea Mining

- **India** plans to explore and mine **deep-sea minerals** in the **Pacific Ocean**, as part of its **'Deep Ocean Mission.'**
- The **International Seabed Authority** has issued **15-year contracts** for **deep-sea mining**, with at least **22 contractors**, including **India and China**.

#### Environmental Concerns and 'Dark Oxygen':

- The study's findings raise concerns about the **impact of deep-sea mining on ecosystems** dependent on **'dark oxygen'** produced by the **nodules**.



- Previous experiments, such as the **Disturbance and Recolonisation (DISCOL) Experiment**, showed **long-term environmental impacts** from **simulated mining activities**.
  - **DISCOL** is conducted by **Germany** in **Peru basin** as the world's "first large-scale impact assessment".
- **Deep-sea mining** could lead to **irreversible loss of ecosystem functions** and **harm marine life**, including **deep-sea jellyfish**.

#### Implications for Deep-Sea Mining and Conservation:

- The discovery of '**dark oxygen**' complicates the potential impacts of **deep-sea mining** on **marine ecosystems**.
- Scientists and insurers are increasingly concerned about the **sustainability and environmental consequences** of such activities, with **some insurers** excluding **deep-sea mining** from their coverage.

### Mega dam, protest in Arunachal

**Sub: Geo**

**Sec: Human geo**

**Context:**

- Two **anti-dam activists** against the **Upper Siang Multipurpose Storage Project** from **Arunachal Pradesh** were detained before Union Power Minister Manohar Lal Khattar's visit.

#### The Upper Siang Project:

- Proposed **11,000 MW hydropower project** on the **Siang River** in **Arunachal Pradesh**.
- **Siang** originates in **Tibet** as **Tsangpo** and becomes **Brahmaputra** downstream in **Assam**.
- The government replaced two planned projects with a single 11,000 MW project by NHPC.
- The project includes a **300-meter high dam**, the **largest in the subcontinent**.
- There are **29 hydroelectric projects** in the **Siang River basin** with a combined capacity of **18,326 MW**.
- The **upper Siang project's** capacity is **60%** of the total current capacity.
- Strategically **aims** to counter **China's hydel projects** on **Tsangpo**, especially the planned **60,000 MW 'super dam'** in **Tibet**.

#### Environmental and Social Concerns:

- Concerns about the **displacement** of over 300 villages, including **Upper Siang district** headquarters in **Yingkiang**.
- Threatens **ancestral lands, delicate ecosystems, wildlife habitats, and biodiversity**.
- Impact on **livelihood and cultural practices**.

#### About Siang/Brahmaputra river:

- The **Brahmaputra** is a **transboundary river** which flows through **Tibet, northeast India, and Bangladesh**.
- It is also known as the **YarlungTsangpo** in **Tibetan**, the **Siang/Dihang River** in **Arunachali**, **Luit** in **Assamese**, and the **Jamuna River** in **Bangla**.
- It is the **9th largest river in the world by discharge** and the **15th longest**.
- With its **origin in the Manasarovar Lake region**, near **Mount Kailash**, on the northern side of the Himalayas in **Burang County of Tibet** where it is known as the **YarlungTsangpo River**. It flows along southern Tibet to break through the Himalayas in **great Gorges** (including the **YarlungTsangpo Grand Canyon**) and into **Arunachal Pradesh**.
- It flows southwest through the **Assam Valley** as the **Brahmaputra** and south through **Bangladesh** as the **Jamuna** (not to be confused with the Yamuna of India).
- In the vast Ganges Delta, it **merges with the Ganges**, popularly known as the **Padma in Bangladesh**, and becomes the **Meghna** and ultimately empties into the **Bay of Bengal**.

### A case of people versus population

**Sub: Geo**

**Sec: Human geo**

#### World Population Day:

- **July 11** has been observed as **World Population Day** since **1989** after the **global population** crossed the **five billion mark**.
- The population is now estimated to be **8.1 billion**, with **India** as the **most populous nation (1.44 billion)**, slightly **more than China's**.

#### Changes in India:

- The population has grown **44%** from **100 crore to 144 crore**, but the **annual growth rate** of the population has **fallen sharply** from **nearly 2% to below 1%**.
- The **total fertility rate (TFR)** has fallen from **3.4 to 2**, just below the “**replacement level**” of **2.1**.
- The **per capita GDP of Indians** grew **six times**, from **\$400 to \$2,400**, and the **average lifespan** of an **Indian** increased from **61 years to 70 years**.
- India faces a **demographic shift** towards an **ageing population**, with **19.5%** of the population projected to be **60 years or older by 2050**.
- The **reduction in fertility** signifies a **transition toward smaller family norms**, potentially leading to a demographic dividend. However, urban migration and gender inequality pose challenges.
- **Indians living below the multi-dimensional poverty line** decreased from **43% to 11%**, although **16 crore people** still remain **below the poverty line**, predominantly in **Uttar Pradesh, Bihar, Madhya Pradesh, and Jharkhand**.

#### Impact of Climate Change:

- **Climate change** poses a significant threat to **India**, with the debate on **historical vs. current emissions** closely linked to the **population vs. people dichotomy**.
- **OECD countries**, with a **per capita income of \$40,000** and a **population of 1.39 billion**, produce and consume **\$55.6 trillion worth of goods**, whereas **India**, with a **per capita GDP of \$2,400** and a **population of 1.44 billion**, produces and consumes **\$3.5 trillion**.
- This disparity has been a major cause of **global warming**, impacting developing nations more severely.
- The Narendra Modi government emphasizes the **importance of economic growth in the Global South**, as articulated in the **G-20 New Delhi Declaration** of September 2023.
- **India aims to achieve net zero by 2070**, with a focus on **eradicating poverty within the next decade**. The **Global South**, including **India**, prioritizes **economic growth to alleviate poverty** over responding to population growth concerns.

#### Future Population Trends:

- The **global population** is expected to reach **8.5 billion** by the end of the decade, with **Asia overpopulated and Europe underpopulated**.
- **Urbanization** will strain **infrastructure and amenities**.
- The **theme of World Population Day** focuses on **women’s sexual and reproductive health and rights**.
- While progress has been made, **maternal deaths** remain **high in developing countries**. **India**, as the **most populous country**, must address issues of inequality and the care burden on women.

#### Migration Trends:

- **Migration** will continue to **shape population distribution**. With **60 crore Indians migrating within the country annually** and **2 crore abroad**, **India** needs to develop new cities to alleviate pressure on existing megacities.
- **Urban centres** drive the **global economy**, but **Indian cities rank poorly in global quality of life assessments**.
- **India** must address **urban challenges** to make its cities livable. **Accurate population data** from a **census** is needed to draft better policies.

#### International Conference on Population and Development (ICPD):

- The **United Nations** coordinated an **International Conference on Population and Development (ICPD)** in **Cairo, Egypt**, on **5–13 September 1994**.
- Its resulting **Programme of Action** is the steering document for the **United Nations Population Fund (UNFPA)**.
- The **ICPD** was the **largest intergovernmental conference on population and development** ever held, with **179 governments** participating and some **11,000 registered participants**- from governments, UN specialized agencies and organizations, intergovernmental organizations, non-governmental organizations and the media.
- **Context and history:**
  - The **first World Population Conference**, organised by the **League of Nations** and **Margaret Sanger**, had been held at the **Salle Central** in **Geneva, Switzerland** from **29 August to 3 September 1927**.
  - The **first World Population Conference** sponsored by the **United Nations** was held in **1954 in Rome**, a second in **1965 in Belgrade**, a third in **1974 in Bucharest**, a fourth in **1984 in Mexico City**.

### How urban expansion makes Delhi susceptible to flooding

#### Sub: Geography

#### Sec: Indian Physical Geography

#### Urban flood in Delhi NCR:

- **Unchecked urban expansion** is a major cause of chronic urban flooding in Delhi and the NCR.
- The **India Meteorological Department (IMD)** recorded **228.1 mm of rain** in **24 hours**, an **88-year high**.
- **Delhi's urban flooding** is exacerbated by **inadequate drain desilting** and poor consideration of **natural drainage patterns** during expansion.

#### A rapidly growing city:

- **Rapid urban expansion** has seen **Delhi's geographic size** almost **double** from **1991** to **2011**, with significant growth in surrounding cities like **Ghaziabad, Faridabad, and Gurugram**.
- By **2030**, **Delhi** is expected to become the **world's most populous city** with nearly **39 million people**.
- Most of this expansion has occurred on the **peripheries of New Delhi**, with **erstwhile rural areas** becoming engulfed in the **capital's urban sprawl**. **Cities outside Delhi**, but a part of the NCR — **Bahadurgarh, Ghaziabad, Faridabad, Noida, and Gurugram** — have also **witnessed rapid urbanisation**.

#### Topography and drainage:

- Historically, **Delhi's cities and villages** were built on **higher ground** to facilitate **natural drainage**.
- **Modern expansion** has **neglected this principle**, resulting in **high run-off** and **inadequate drainage systems**.
- **Urbanisation** has led to **water channelisation** into **concretised drains**, which are often used as **sewage dumps**.
- **Construction in low-lying areas** and on **flood plains** has **worsened flooding**, with areas like **Sarai Kale Khan** experiencing **intense annual flooding**.

#### Concrete everywhere:

- **Concretisation** has **reduced rainwater absorption**, leading to more **surface flooding**.
- **Floodplain encroachment occurred:**
  - When the British decided to build a railway line along the riverbed.
  - When the **Ring Road** came up, again on the **Yamuna floodplain**.
  - Flood plains near **Kashmere Gate** were reclaimed by the Delhi Metro for its maintenance shed.
  - During the Commonwealth Games in 2010.

#### No 'water masterplan':

- The **lack of a "water masterplan"** and **consistent neglect of water** as a planning resource have exacerbated the issue.
- Important water bodies have been destroyed, reducing the **city's capacity to manage flooding**.
- **Effective flood management** requires **stopping construction in low-lying areas, de-concretising surfaces, and maintaining proper drainage**.
- Setting up **filtration pits in low-lying areas** can help **manage water flow** and **prevent flooding**.

#### How climate change fuelled Hurricane Beryl's record early intensification

##### Sub: Geography

##### Sec: Phy Geo

#### Hurricane Beryl's Record-Breaking Impact:

- **Hurricane Beryl** became the **earliest storm on record** during the Atlantic hurricane season to reach **Category 5**.
- The storm caused at least 11 deaths and severe damage across **Jamaica, Grenada, Saint Vincent and the Grenadines, and northern Venezuela**.
- It made landfall in **Texas** as a **Category 1 storm**, causing extensive flooding and power outages affecting over two million people.

#### Unprecedented Early Category 5 Status:

- Typically, the first major hurricanes in the Atlantic form in September due to ocean temperatures.
- **Beryl's early formation** as a **Category 5 hurricane** is linked to **unusually warm ocean temperatures**.
- **Record-breaking ocean heat content (OHC)** has contributed to the **storm's intensity**.
- **Deep warm water** prevented **cooling** at the surface, allowing the storm to maintain its strength.

#### Formation of Hurricanes:

- **Hurricanes** form over **warm ocean waters** near the **equator** when **warm, moist air rises, creating a low-pressure area**.
- As air from surrounding areas fills in and rises, it cools, forming clouds and thunderstorms.
- This system **gains strength** from the **ocean's heat and water evaporation**.
- **Storms with wind speeds of 119 kmph** and above are classified as **hurricanes**, using the **Saffir-Simpson Hurricane Wind Scale (Category 1 to Category 5)**.

- **Category 5 hurricanes** have winds of **252 kmph or higher** and are considered major hurricanes.

### Climate Change and Future Hurricanes

- Scientists agree that climate change contributes to the rapid intensification of hurricanes.
- A 2023 study indicates an increase in rapid intensification events in the Atlantic from 1971 to 2020.
- As oceans warm, more powerful hurricanes like Beryl are likely to form.
- The increasing frequency and intensity of such events pose significant future risks.

## Goa & Karnataka at loggerheads again over Kalasa-Banduri project as central body inspects Mahadayi basin

### Sub: Geography

#### Sec: Indian Physical Geo

##### Context:

- On July 7, 2024, a team from the **Progressive River Authority for Water and Harmony (PRAWAH)** visited the **Belagavi district**, part of a tour of **Goa, Karnataka, and Maharashtra** through which the **Mahadayi River** flows.
- The visit rekindled a **four-decade-old dispute** between **Karnataka and Goa** over sharing the **Mahadayi River**.
- **Environmental concern includes** Deforestation and its impact on tiger conservation, although **no tiger presence** was reported in the **Kanakumbi forest**.

##### Mahadayi River dispute:

- In **1985**, **Karnataka** proposed a **350 MW hydroelectric project** to divert half of the **Mahadayi River's water** for **irrigation**, sparking long-standing protests from **Goa** over potential water security issues.
- **PRAWAH** officials inspected **Chorla Ghat** and **Haratala Nala** and met with state irrigation officials, discussing the **Kalasa and Banduri projects**.

##### Dispute and Tribunal Verdict:

- The **Mahadayi Water Tribunal**, established under the **Interstate River Water Disputes Act**, allocated water to **Goa, Karnataka, and Maharashtra** in **2018**.
- The **tribunal** allowed **Goa to use 24 tmcft, Karnataka 5.4 tmcft, and Maharashtra 1.33 tmcft**.
- **Karnataka** appealed to the Supreme Court, claiming the allocation was unfair.
- In **February 2020**, the **central government** allowed **Karnataka** to draw **13.42 tmcft** of water, including **8 tmcft** for **power generation**, but no water has been received yet.

##### Mahadayi river:

- The **Mandovi** or **Mahadayi**, formerly known as the **Rio de Goa**, is a river described as the **lifeline of the Indian state of Goa**.
  - The **Mandovi** and the **Zuari** are the **two principal rivers** in the state of **Goa**.
- The **Mandovi joins with the Zuari** at a **common creek** at **Cabo Aguada**, forming the **Mormugao harbour**.
  - **Cumbarjua Canal** links both the river.
- **Panaji**, the state capital and **Old Goa**, the former capital of **Goa**, are both situated on the left bank of the **Mandovi**.
- **Origin:** A cluster of 30 springs at **Bhimgad** in the **Western Ghats** of **Belgaum district** in **Karnataka state**.
- **Major waterfalls:** **Dudhsagar Falls** and **Varapoha Falls**
- **Mouth:** **Arabian Sea**
- **Tributaries:** **Nerul River**, **St Inez Creek**, **Rio de Ourém**, **Mapusa River**, **Valvanti River**, **Udnai River**, **Dudhsagar River**, **Ragada River** and **Kotrachi Nadi**.
- **Islets:** Three large freshwater isles — **Divar**, **Chorão** and **Vanxim** are present in the **Mandovi** near the town of **Old Goa**. The **island of Chorão** is home to the **Salim Ali Bird Sanctuary**, named after the **renowned ornithologist Salim Ali**.

## 122 dead as landslides flatten Wayanad villages

### Sub: Geo

#### Sec: Physical geo

##### Context:

- At least **122 people** were **killed** and **197 injured** due to multiple landslides in **Vythiri taluk, Wayanad district, Kerala**, on **July 30**.
- **Affected area:** **Chooramala Bridge, Chaliyar River**.

##### Worst landslides in India:

Guwahati, Assam	<ul style="list-style-type: none"> <li>• <b>September 18, 1948</b></li> <li>• The landslide took place on the frontier tracts of <b>North-East Assam</b> due to heavy rains.</li> </ul>
Darjeeling, West Bengal	<ul style="list-style-type: none"> <li>• <b>October 4, 1968</b></li> <li>• There was continuous rainfall in the region of <b>Sikkim</b> and <b>Darjeeling</b>. The rain caused hundreds of landslides. A <b>60 km long highway</b> was cut into 91 parts. The famous <b>Anderson Bridge</b> at the <b>Teesta Bazar</b> had completely washed off.</li> </ul>
Malpa, Uttarakhand	<ul style="list-style-type: none"> <li>• <b>August 18, 1998</b></li> <li>• Considered to be <b>one of the worst landslides in India</b>, a <b>five-metre-high avalanche</b> of rock and water wiped away the entire village of <b>Malpa</b> in the <b>Pithoragarh district</b> of <b>Uttarakhand</b>, including <b>60 Kailash Mansarovar pilgrims</b> - most of them in their sleep.</li> </ul>
Mumbai, Maharashtra	<ul style="list-style-type: none"> <li>• <b>July 12, 2000</b></li> <li>• The landslide took place in the suburbs of <b>Ghatkopar</b> due to heavy rains which were followed by land erosion.</li> </ul>
Amboori, Kerala	<ul style="list-style-type: none"> <li>• <b>November 9, 2001</b></li> <li>• One of the <b>worst natural disasters in Kerala's history</b> occurred in <b>Amboori</b> in <b>Thiruvananthapuram district</b> when a landslide claimed the lives of 39 people.</li> </ul>
Kedarnath, Uttarakhand	<ul style="list-style-type: none"> <li>• <b>June 16, 2013</b></li> <li>• As a result of the <b>Uttarakhand floods</b>, major landslides occurred in <b>Kedarnath</b>.</li> </ul>
Malin, Maharashtra	<ul style="list-style-type: none"> <li>• <b>July 30, 2014</b></li> <li>• Believed to have been caused by a burst of heavy rainfall, a landslide occurred in the village of <b>Malin</b> in the <b>Pune district</b>.</li> </ul>
Pettimudi, Kerala	<ul style="list-style-type: none"> <li>• <b>August 6, 2020</b></li> <li>• Relentless rainfall in the <b>Idukki district</b> led to a boulder bursting from the border of the <b>Iravikulam National Park</b> with a loud noise and falling into the <b>Pettimudi River</b> destroying the labour camps two kilometres below as well as a <b>tea plantation estate</b>, killing over 65 workers.</li> </ul>
Mumbai, Maharashtra	<ul style="list-style-type: none"> <li>• <b>July 18, 2021</b></li> <li>• A series of landslides triggered by incessant rains occurred in the suburbs of <b>Chembur</b> and <b>Vikhroli</b>.</li> </ul>
Tupul, Manipur	<ul style="list-style-type: none"> <li>• <b>June 30, 2022</b></li> <li>• A large landslide occurred in the <b>Noney district</b> of <b>Manipur</b> near the <b>Tupul railway construction site</b>.</li> <li>• The <b>landslide debris</b> blocked the <b>river Ijai</b>, threatening to flood the nearby villages.</li> </ul>
Raigad, Maharashtra	<ul style="list-style-type: none"> <li>• <b>July 19, 2023</b></li> <li>• A landslide occurred in <b>Raigad</b> due to torrential rains.</li> </ul>
Aizwal, Mizoram	<ul style="list-style-type: none"> <li>• <b>May 28, 2024</b></li> <li>• <b>Cyclone Remal's</b> incessant rain left a trail of destruction across many North-Eastern states.</li> </ul>
Shirur, Karnataka	<ul style="list-style-type: none"> <li>• <b>July 16, 2024</b></li> <li>• A landslide occurred in <b>Shirur, Ankola</b> in <b>Uttara Kannada</b> in <b>Karnataka</b>. The landslide was caused by torrential rains, more than three are estimated as trapped under debris and in the nearby <b>Gangavalli River</b>. There has been a huge rescue operation for <b>Arjun, a lorry driver</b>, which has been unsuccessful so far.</li> </ul>
Wayanad, Kerala	<ul style="list-style-type: none"> <li>• <b>July 30, 2024</b></li> <li>• <b>Heavy rains</b> have triggered <b>massive landslides</b> in the early morning and have rocked the hamlets of <b>Mundakkai, Chooralmala, Attamala, and Noolpuzha</b> in <b>Wayanad district</b>, leaving hundreds of people trapped.</li> </ul>

**Why is India drilling a 6-km deep hole in Maharashtra?**

**Sub: Geography**

**Sec: Geomorphology**



### Context:

- **The Borehole Geophysics Research Laboratory (BGRL)** in Karad, Maharashtra, a specialized institute under the **Ministry of Earth Sciences of the Government of India** is mandated to execute **India's sole scientific deep-drilling programme at Koyna, Maharashtra.**

### More on news:

- **Powerful earthquakes** measuring **more than 7.5 on the Richter scale** occur at the **boundaries of tectonic plates** and are almost certainly associated with a **severe loss of infrastructure and life.**
- However **minor earthquakes** that occur in a **plate's interior** are more **challenging to predict** because they **occur at the least expected sites** and could strike densely populated habitats.
- Therefore **scientific deep drilling** becomes an **indispensable tool** for progress in the earth sciences.
- Countries like the U.S., Russia, and Germany conducted such scientific projects in the 1990s.
- Similarly **India aims to drill the earth's crust to a depth of 6 km and conduct scientific observations** and analysis to help expand the understanding of reservoir-triggered earthquakes in the active fault zone in the **Koyna-Warna region of Maharashtra.**

### What is scientific deep-drilling?

- Scientific deep-drilling is the enterprise of **strategically digging boreholes to observe and analyze deeper parts of the earth's crust.**
- It offers opportunities and access to **study earthquakes** and expands our understanding of the planet's history, **rock types, energy resources, life forms, climate change patterns, the evolution of life,** and more.
- Such missions can be a hub of direct, **in-situ experiments and observations and strategically monitor a region's fault lines** and earthquake behavior (including nucleation, rupture, and arrest).

### What is the drilling technique used at Koyna?

- **The Koyna pilot borehole** is about 0.45 m wide (at the surface) and **roughly 3 km deep.**
- It is unique in many ways because of the drilling technique: a hybrid of two well-established techniques called **mud rotary drilling and percussion drilling** (a.k.a. air hammering).
- **The rotary drilling technique** uses a **rotating drilling rod made of steel**, attached to a diamond-embedded drill bit at the bottom.
- **The second technique, air hammering,** pushes **highly compressed air** (in place of the drilling mud) through the drilling rod **to deepen the borehole** and flush the cuttings out.

### What are the challenges of scientific deep-drilling?

- **Scientific deep-drilling** is also the most challenging method as deep-drilling is labor- and capital-intensive.
- The **earth's interior** is also a **hot, dark, high-pressure region** that hinders long and continuous operations.

### What are 'rogue waves' and how can AI help predict them?

**Sub: Geo**

**Sec: Hydrology**

#### Rogue Waves

- **Rogue waves** are **unusually large waves** compared to ones which come before and after, that can **threaten ships, coastal and offshore infrastructure, and human lives.**
- **No forecasting method** existed for **rogue waves** until recently.

#### AI Forecasting Method:

- **University of Maryland** mathematicians Thomas Breunung and Balakumar Balachandran developed an **AI program to forecast rogue waves.**
- The **AI** was trained using billions of data points from **172 ocean buoys.**
- The **AI** can **distinguish wave patterns** that precede rogue waves up to five minutes in advance.

#### Deadly Surprises:

- **Sea state** refers to the **condition of the water surface** at a **specific location and time.**
- The **WMO sea state code** rates **wave height** on a scale from **0** (no waves) to **9** (waves over 14 m).
- **Rogue waves** are **twice** the size of surrounding waves and often form when swells converge or when ocean currents compress swells.
- **Rogue waves** have caused significant fatalities and ship sinkings due to the lack of a real-time forecasting method.



## Why is Brazil's Pantanal breaking wildfire records? It has lost the most water since 1985, says study

### Sub: Geography

#### Sec: Mapping

##### About Pantanal:

- It is the world's largest freshwater tropical wetland, located in South America
- The Pantanal spans over 179,000 sq km in Brazil, Paraguay and Bolivia and boasts.
- It is one of Earth's most biodiverse ecosystems and one of the highest concentrations of flora and fauna in South America.
- Amazon rainforest located to its north
- The headwaters of the region's two major river systems, the Cuiabá and the Paraguay rivers, are located here,
- Some of the Pantanal's most lively inhabitants include jaguars, giant anteaters, piranha, howler and capuchin monkeys, and green anacondas—the world's largest snakes
- unlike the Amazon, where the thick jungle obscures the view, the Pantanal is such an open environment
- **Part of the Pantanal is UNESCO World Heritage site**

##### Record Wildfires in the Pantanal:

- The **Pantanal**, the **world's largest tropical wetland**, experienced unprecedented wildfires this year, setting January-June records.
- **Fires** are primarily due to **significant water loss**; 2023 saw a **61% reduction in annual water surface** compared to historical averages.
- **Only 2.6%** of the **Pantanal** was covered by water last year, a significant decrease from previous years.
- **2024** has seen peak drought conditions with **no flood peaks**, making fires difficult to control.

##### Impact on Biodiversity:

- **Fires** in the **Pantanal** have **increased over tenfold** compared to last year, with fears of another **record-breaking fire year**.
- The **Pantanal** is home to significant **biodiversity**, including **caiman, capybara**, and the **highest density of jaguars**.

##### Water Surface Reductions in Other Biomes:

- **The Amazon:** Water surface was reduced by **3.3 million hectares** in 2023, suffering a severe drought that caused **isolation of populations and deaths of aquatic species**.
- **The Pampa (The grasslands that cover a large area in southern Brazil, northern Argentina and Uruguay):** Water surface area of reservoirs was **40% below average**.

##### Positive News from the Cerrado:

- **Cerrado** is a vast area of **tropical savanna** in **eastern Brazil**.
  - The **core areas of the Cerrado biome** are the **Brazilian highlands** – the **Planalto**.
- The **Cerrado** saw its **largest water surface** since **1985**, totalling 1.6 million hectares, 11% above historical averages.
- The increase occurred in **anthropogenic areas**, though natural water bodies lost surface area.

##### Overall Water Coverage in Brazil:

- In **2023**, water covered **18.3 million hectares** of **Brazil**, **2%** of the national territory.
- This represents a **1.5% decrease** compared to historical averages, with a loss of water every month compared to 2022.

## Process for transfer of five-gram panchayats from A.P. to Telangana to gain momentum

### Sub: Geography

#### Sec: Mapping

##### Context:

- The meeting between **Telangana CM A. Revanth Reddy** and **Andhra Pradesh CM N. Chandrababu Naidu** was the **first in four-and-a-half years** and led to crucial decisions.

##### Key Decision:

- **Re-merger of Gram Panchayats:**
  - Focus on **transferring five-gram panchayats** around the **temple town of Bhadrachalam** from **Andhra Pradesh (A.P.) to Telangana**.
  - **Aimed** at addressing difficulties locals face in **accessing emergency services**.
- **Legal Procedures:**

- The **re-merger process** requires an **amendment** to the **Andhra Pradesh Reorganisation Act, 2014**, passed by Parliament.
- **Both state governments** will initiate steps to expedite the process.
- **Telangana and A.P. governments** need to pass **resolutions** in their **Legislative Assemblies** for the **re-merger**.
- Once both states give their consent, the matter will be forwarded to the **Central government** for **amending the Reorganisation Act**.

#### Background:

- **Previous Mergers:**
  - In **2014**, gram panchayats (**Etapaka, Gundala, Purushottapatnam, Kannaigudem, Pichukalapalem**) and **seven mandals of Khammam district** were merged with A.P.
  - This **merger** caused **administrative and legal issues**, particularly with the **endowment lands** of the **Bhadrachalam temple**.

## History

### A cavernous palimpsest

#### Sub: History

#### Sec: Art and Culture

#### Chandravalli Cave Complex:

- Located in **Chitradurga district, Karnataka**.
- Known as **Ankali Math**, named after a **saint** from **Ankalagi in Belagavi district**.
- Approximately three km from **Chitradurga fort**.
- Accessible through a narrow entrance, requiring a powerful torch for visibility.
- The region is a valley formed by **three hills, Chitradurga, Kirabanakallu and Jolagudda**.

#### Historical Significance:

- Believed to be a **meditation site** and **Gurukul** by the saint and his followers.
- Excavations have revealed artefacts such as **coins, painted bowls**, and **earthen pots** from the **Hoysala, Satavahana, and Vijayanagara dynasties**.
- Contains a **rock inscription of Mayurasharma**, the founder of the **Kadamba dynasty**, dating back to **AD 450**.
- Evidence of connections with **Rome and China** through coins found at the site.
- Walls adorned with paintings made from organic paint.



#### Features:

- The cave complex includes several chambers: a **puja place** with a **shiva linga**, a drawing room, a bedroom, and a **water outlet** connected to an **internal tank**.
- Some chambers are **extremely dark**, necessitating the presence of a guide to avoid getting lost.

#### Current State:

- The **cave complex** is maintained by **Murugharajendra Math**.
- The area is kept clean and free of illegal activities largely due to the personal initiative of local guides.
- Maintenance has suffered due to the arrest of the senior head of the math.
- Guides depend on income from weekend tourists.

### Puri Jagannath Temple's Ratna Bhandar

#### Sub : History

## Sec : Art and Culture

**Context:** Recently the Odisha government formed a new panel to monitor the opening of Puri Jagannath Temple's Ratna Bhandar (Treasury) by dissolving the old panel.

### What is Ratna Bhandar(Treasury)

- **Jagannath Temple's Ratna Bhandar**
  - The Ratna Bhandar of the Jagannath Temple houses **precious ornaments dedicated to Lord Jagannath, Lord Balabhadra, and Goddess Subhadra.**
  - These ornaments have been **donated by devotees and erstwhile kings** over centuries, making them historically significant.
- **Structure of the Ratna Bhandar**
  - The Ratna Bhandar consists of two chambers:
    - **Bhitar Bhandar (Inner Chamber):** This chamber has not been opened for the past 38 years.
    - **Bahara Bhandar (Outer Chamber):** Ornaments are regularly fetched from this chamber for use in rituals and festivals.
- **Current Issues and Demands**
  - **Demand for Opening:** There is a growing demand to open the **Ratna Bhandar due to concerns about the structural integrity** of the inner chamber.
  - **Reasons for Concern:** Apprehensions about cracks in the walls of the inner chamber have prompted fears that these structural issues **could jeopardise the safety of the priceless ornaments stored within.**
- **Involvement of Archaeological Survey of India (ASI)**
  - **Role of ASI:** The Archaeological Survey of India, which **oversees the temple's preservation**, has requisitioned access to the Ratna Bhandar.
  - **Purpose:** ASI aims to assess, repair, and conserve the **chamber to ensure the safety and preservation** of both the structural integrity and the valuable ornaments.
- **Significance and Cultural Importance**
  - **Cultural Heritage:** The ornaments stored in the **Ratna Bhandar represent not only religious significance** but also cultural and historical heritage.
  - **Preservation Efforts:** Opening and repairing the **Ratna Bhandar are seen as crucial steps to safeguard** this heritage for future generations.

### What are the Key Facts about Jagannath Temple?

- **Introduction to Jagannath Temple**
  - **Location:** The Jagannath Temple is located in **Puri, Odisha, India.**
  - **Deities:** It is dedicated to **Lord Jagannath (Krishna)**, accompanied by his **siblings Lord Balabhadra and Devi Subhadra.**
- **Historical Background**
  - **Foundation:** The temple dates back to the **12th century** and is a significant Hindu pilgrimage site.
  - **Architectural Style:** Built in the **Kalinga style of architecture**, known for its pyramid-like spire (shikhar) and intricate carvings.
- **Structure and Layout**
  - **Main Temple:** The main temple structure, called the "**Deula**", **houses the sanctum sanctorum** where the deities are enshrined.
  - **Surrounding Complex:** The temple complex is enclosed by a **high fortified wall known as the "Meghanada Pacheri".**
- **Rituals and Festivals**
  - **Rath Yatra:** The annual **Rath Yatra (chariot festival)** is the most famous festival, where the deities are placed on **grand chariots** and pulled through the streets of Puri.
  - **Daily Rituals:** Elaborate rituals are performed daily, including offering of food (**bhog**), **aarti**, and **various sevās** (services) to the deities.
- **Administration and Custodianship**
  - **Administration:** The temple is managed by a body known as the **Shree Jagannath Temple Administration (SJTA).**
  - **Custodianship:** The **Archaeological Survey of India (ASI)** plays a role in the **preservation and conservation of the temple's architectural heritage.**

## Discovery of the World's Oldest Figurative Cave Painting

### Sub : History

#### Sec: Art and Culture

**Context:** Researchers have recently unveiled a groundbreaking discovery in the field of archaeology: the world's oldest known **figurative cave painting**, dating back an astonishing **51,200 years**.

#### About the new discovery

- **Discovery and Age of the Painting**
  - The world's oldest known figurative cave painting, located in **Leang Karampuang** cave in **Sulawesi, Indonesia**, has been dated to **51,200 years ago**.
  - This discovery surpasses the previously oldest known cave art, a pig painting from **Leang Tedongge**, Indonesia, by over 5,000 years.
- **Description of the Painting**
  - The painting depicts a red-pigmented scene featuring a **wild pig** with its mouth open.
  - Surrounding the pig are three figures that are **part-human and part-animal (therianthropes)**.
  - The figures are depicted in **dynamic poses**, suggesting action and storytelling.
- **Significance of the Painting**
  - The painting suggests a deeper origin of figurative art among modern humans (**Homo sapiens**) than previously recognized.
  - It highlights a culture of storytelling through visual art in the **Late Pleistocene era**, much earlier than similar scenes found in Europe.
- **Methodology: New Dating Technique**
  - The dating was performed **using uranium series (U-series) analysis of calcite deposits overlying** the rock art in limestone caves.
  - **Laser beams** were used to analyse the ratio of **uranium to thorium isotopes**, allowing **precise dating of the paintings**.
  - This technique provided more accurate dating compared to previous methods, revealing the painting's true age.
- **Implications and Further Research**
  - The discovery challenges previous notions about the timeline and sophistication of early human art.
  - It underscores the importance of scientific methods in **archaeological research**, providing insights into **ancient human cultures** and their artistic expressions.
  - Further exploration and dating of similar sites could provide additional understanding of early **human creativity** and cultural development.

#### Prehistoric paintings In India

- **Discovery of Prehistoric Cave Paintings in India**
  - Prehistoric cave paintings dating back to the **Upper Palaeolithic** era have been discovered worldwide.
  - In India, the earliest reported paintings date to the **Upper Palaeolithic times, predating the discovery of Altamira in Spain**.
- **Early Explorations and Archaeologists**
  - In 1867-68, Archaeologist **Archibold Carlleyle** discovered the **first prehistoric rock paintings in India**.
  - Renowned archaeologists such as **Cockburn, Anderson, Mitra**, and Ghosh further unearthed numerous sites across regions like **Madhya Pradesh, Uttar Pradesh, Andhra Pradesh, Karnataka, Bihar, and Uttarakhand**.
- **Characteristics of the Paintings**
  - The paintings feature stick-like **human figures, animals** such as long-snouted creatures, foxes, and **multi-legged lizards**.
  - Geometric patterns in white, black, and red ochre are also commonly depicted.
- **Notable Sites and Examples**
  - **Lakhudiyar, near Almora**, hosts rock shelters along the **River Suyal adorned with these prehistoric paintings**.
  - Scenes include **hand-linked dancing human figures**, showcasing early artistic expression and social activities.
  - **Superimposed paintings** reveal layers of black, red ochre, and white, indicating successive periods of artistic activity.
- **Other Forms of Artistic Expression**

- **Engravings on slabs** were discovered in **Kashmir**, offering additional insights into prehistoric artistic practices.
- Granite rocks in Karnataka and **Andhra Pradesh** feature paintings in white, red ochre, or combinations thereof at sites like **Kupgallu, Piklihal, and Tekkalkota**.
- **Significance and Cultural Insights**
  - These discoveries provide a glimpse into the lives, **beliefs, and artistic capabilities of prehistoric humans in India**.
  - They underscore the universality of early human creativity and the development of symbolic communication through art.

## Abhaya Mudra

### Sub : History

### Sec : Art and Culture

**Context:** In his first speech as the Leader of the **Opposition in the Lok Sabha, Rahul Gandhi talked** about the abhaya mudra. This is a gesture where the hand is raised with an open palm, symbolizing reassurance and freedom from fear.

- He mentioned that this gesture is commonly seen in depictions of **Lord Shiva, Guru Nanak, and Jesus Christ**, and is also found in Islam, Buddhism, and Jainism.

### About Abhaya Mudra

The **Abhaya Mudra** is a gesture where the hand is open and facing outward, often seen as a signal to stop.

It's known as the "**fearlessness gesture**," derived from the **Sanskrit word "abhaya,"** meaning fearlessness.

Symbolically, it represents protection, peace, and the dispelling of fear. In yoga, it's believed to foster courage and reduce fear and anxiety.

This gesture is **prevalent in many South Asian religions, including Hinduism, Buddhism, Jainism, and Sikhism**. It holds particular significance in Thailand and Laos, often associated with depictions of the **walking Buddha**.

According to a Stanford University newsletter, **the open palm gesture likely originated as a natural sign of good intentions**, used since prehistoric times to propose friendship or peace.

In ancient times, it also symbolises power, such as the "**magna manus**" of **Roman Emperors**, who used the gesture to both legislate and grant peace.

The gesture appears to have evolved from a **universal form of human communication**, eventually becoming integrated into major South Asian religions.

### Religious significance in Buddhism

- According to legend, there was a moment when **Devadatta, Buddha's jealous cousin**, attempted to kill him by releasing a rampaging elephant.
- In response, Buddha calmly displayed the **Abhaya Mudra, an open-palm gesture**.
- This gesture **instantly pacified the elephant**, demonstrating Buddha's ability to calm not only the animal but also to dispel fear itself.
- Thus, the **Abhaya Mudra in Buddhism symbolises both the calming of the senses and the absence of fear**, illustrating Buddha's teachings on fearlessness and inner peace.

### Some other Mudras

In Buddhism, there are five primary mudras, each carrying deep symbolic meaning:

**Abhaya Mudra:** This mudra is associated with **Amoghasiddhi, the fifth Dhyani-Buddha**. It symbolises peace, reassurance, and protection. The gesture is performed with either the right hand or both hands, fingers outstretched, palms facing the viewer.

**Dharmachakra Mudra:** Linked to **Vairochana, the first Dhyani-Buddha**, this mudra signifies the moment when Buddha delivered his first sermon after Enlightenment. It forms a circle with the thumb and index finger touching, representing the Wheel of Dharma. The remaining fingers are extended.

**Bhumisparsha Mudra:** Also known as the "**earth touching mudra**," it symbolises Buddha's enlightenment under the bodhi tree. Associated with Akshobhya, this mudra shows the seated Buddha touching the earth with his right hand, fingers extended downward.

**Varada Mudra:** Associated with **Ratnasambhava, the third Dhyani-Buddha**, this mudra is known as the "**boon-granting**" gesture. It is performed with the left hand, palm facing outward and downward, **symbolising generosity and compassion**.

**Dhyana Mudra:** Meaning "meditation," this mudra is associated with **Amitabha, the fourth Dhyani-Buddha**. It is performed in a seated meditation posture (padmasana), with both hands resting on the lap or thigh, palms facing upward, and right hand over the left, fingers fully extended.

These mudras play significant roles in Buddhist iconography, representing different aspects of Buddha's teachings and spiritual qualities.

## Centre set to tweak criteria for according classical language status

**Sub: History**

**Sec: Art and Culture**

**Context :** Amid a clamour for classical status for many languages, the Central government has decided to tweak the criteria for giving this special tag.

The **Linguistics Expert Committee of the Union Culture Ministry** submitted a report on October 10 last year, suggesting some tweaks and changes in the criteria for according classical status to any language,

The matter had been taken up after the Centre asked them to reconsider the rules. The issue was taken up first at a meeting on June 21, 2023. The new set of criteria will be officially notified by a gazette notification after it is approved by the Union Cabinet.

This in effect means that classical language status for certain languages, chiefly Marathi, which are under the consideration of the government, might have to wait till the new criteria is notified.

The Linguistics Expert Committee comprises representatives of the Union Ministries of Home, Culture and four to five linguistic experts at any given time. It is chaired by the president of the Sahitya Akademi.

Over the years, there have been demands from some States and literary circles for classical status to languages such as **Marathi, Bengali, Assamese and Maithili**. Of these, the case of Marathi has been pending for more than a decade.

### About Classical language

- Currently there are **six languages** that enjoy the 'Classical' status in India:
  - **Tamil** (declared in 2004), **Sanskrit** (2005), **Kannada** (2008), **Telugu** (2008), **Malayalam** (2013), and **Odia** (2014).
- All the Classical Languages are listed in the **Eighth Schedule** of the Constitution.
- The **Ministry of Culture** provides the guidelines regarding Classical languages.

### Guidelines for declaring a language as 'Classical'

- High antiquity of its early texts/recorded history over a period of **1500-2000 years**;
- A body of **ancient literature/texts**, which is considered a valuable heritage by generations of speakers;
- The **literary tradition be original and not borrowed from another** speech community;
- The **classical language and literature being distinct from modern**, there may also be a **discontinuity between the classical language** and its later forms or its offshoots.

### Benefits of classical language

- Once a language is notified as a Classical language, the Human Resource and Development Ministry provides certain benefits to promote it:
  - **Two major annual international awards** for scholars of eminence in classical Indian languages
  - A **Centre of Excellence** for studies in Classical Languages is set up
  - The **University Grants Commission** is requested to create, to start with at least in the Central Universities, a certain number of Professional Chairs for the Classical Languages so declared.

## Chance discovery of treasure pot sparks frenzy

**Sub: History**

**Sec: Art and Culture**

The chance discovery of a pot containing 18th century gold and silver coins, and other period artefacts has suddenly elevated the profile of the sleepy village of Chengalai in Kannur district of Kerala.

- Coins bore the hallmarks of the late 18th century, with some displaying **Indo-French and Kannur Ali Raja markings**.
- The bead necklaces appeared to be from the same era.

King Ali Raja

- **Ali Raja** was the title of the Muslim king of **Arakkal dynasty** of Kannur, who ruled during the 17<sup>th</sup> – 19<sup>th</sup>
- **Arakkal dynasty** Kerala's only Muslim kingdom
- The eldest member of the family, whether male or female, became its head and ruler.
- While male rulers were called Ali Rajah, female rulers were known as **Arakkal Beevis**.

## Kedarnath Temple

**Sub : History**

**Sec: Art and Culture**

**Context:** The Bharatiya Janata Party (BJP) government in Uttarakhand is facing significant controversy over the construction of a temple in Delhi that symbolically represents the Kedarnath shrine.



- Chief Minister **Pushkar Singh Dhama** laid the foundation stone for a temple in Delhi that symbolises the Kedarnath shrine. This move is seen as an attempt to create a representation of Uttarakhand's religious heritage in the national capital.
- **Opposition from Priests:** The priest community in Uttarakhand has strongly opposed this initiative. They argue that the construction of such a temple outside Uttarakhand, especially in Delhi, undermines the sanctity and importance of the original Kedarnath shrine.
- **About Kedarnath Temple**
  - **Dedication:** Dedicated to Lord Shiva, specifically as one of the 12 Jyotirlingas in India.
  - **Location:** Situated at an altitude of 3,584 metres in the Garhwal Himalayan range near the Mandakini river, in Rudraprayag District, Uttarakhand.
  - **History:** Believed to have been originally built by the Pandavas of Mahabharata fame. It was later reconstructed by Adi Shankaracharya in the 8th century AD.
  - **Architecture:** Known for its exquisite architecture, the temple is constructed with large, evenly shaped grey stone slabs interlocked using iron clamps. No mortar has been used in its construction.
  - **Inner Sanctum:** Houses a conical rock structure worshipped as the Sadashiva form of Lord Shiva. It includes a Garba Griha (sanctum sanctorum) for worship and a Mandap (hall) for pilgrims.
- **Chota Char Dham Yatra**
  - **Definition:** Refers to the pilgrimage journey to four sacred Hindu temples in Uttarakhand.
  - **Temples:** Includes Yamunotri (dedicated to Goddess Yamuna), Gangotri (dedicated to Goddess Ganga), Badrinath (dedicated to Lord Vishnu), and Kedarnath (dedicated to Lord Shiva).
  - **Significance:** Undertaking the Chota Char Dham Yatra is considered spiritually significant among Hindus, believed to cleanse sins and grant spiritual liberation.
- **Jyotirlingas**
  - Definition: Jyotirlingas are shrines where Lord Shiva is worshipped in the form of a Jyotirlingam, symbolizing the radiant pillar of light.
  - Number: There are 12 main Jyotirlinga temples across India, each representing a manifestation of Lord Shiva's cosmic light.
  - **List of 12 Jyotirlingas:**
    - Somnath Jyotirlinga in Gir, Gujarat
    - Mallikarjuna Jyotirlinga in Srisailem, Andhra Pradesh
    - Mahakaleshwar Jyotirlinga in Ujjain, Madhya Pradesh
    - Omkareshwar Jyotirlinga in Khandwa, Madhya Pradesh
    - Baidyanath Jyotirlinga in Deoghar, Jharkhand
    - Bhimashankar Jyotirlinga in Maharashtra
    - Ramanathaswamy Jyotirlinga in Rameshwaram, Tamil Nadu
    - Nageshwar Jyotirlinga in Dwarka, Gujarat
    - Kashi Vishwanath Jyotirlinga in Varanasi, Uttar Pradesh
    - Trimbakeshwar Jyotirlinga in Nasik, Maharashtra
    - Kedarnath Jyotirlinga in Rudraprayag, Uttarakhand
    - Ghreshwar Jyotirlinga in Aurangabad, Maharashtra

## 46th Session Of Unesco's World Heritage Committee

**Sub : History**

**Sec: Art and Culture**

**Context:** On a significant occasion for global heritage, the Prime Minister inaugurated the 46th Session of the World Heritage Committee at Bharat Mandapam in New Delhi.

**About 46th session:**

- India's hosting of the World Heritage Committee Meeting from July 21 to 31, 2024, at Bharat Mandapam in New Delhi is a significant event.
- More than 2000 delegates from over 150 countries are participating, making it a truly international gathering.
- The meeting focuses on crucial aspects such as new site nominations, conservation reports, international assistance, and the utilization of World Heritage Funds.
- This event is particularly important as it marks the first time India is hosting such a prestigious meeting.

- The discussions held here will play a crucial role in managing and inscribing new sites on the World Heritage list.
- The presence of forums like the World Heritage Young Professionals' Forum and the World Heritage Site Managers' Forum adds further depth and engagement to the proceedings.
- **Prime Minister's Announcement:**
  - India proudly announced the nomination of North East India's historic Maidam to UNESCO's World Heritage List.
  - This nomination is significant as it would mark India's 43rd World Heritage Site and the first from North East India, highlighting its cultural importance.
- **India's Rich and Ancient Heritage:**
  - The Prime Minister emphasised India's deep-rooted and ancient heritage.
  - He highlighted that New Delhi itself is a centre of millennia-old history.
- **Examples of Ancient Sites:**
  - **Iron Pillar:** A 2000-year-old iron pillar known for its advanced metallurgical techniques.
  - **Kedarnath Temple:** An 8th century temple showcasing India's architectural and religious heritage.
  - **Brihadeeswara Temple:** A marvel of Chola architecture in Tamil Nadu, reflecting ancient temple construction expertise.
  - **Dholavira and Lothal:** Archaeological sites of the Indus Valley Civilization, demonstrating India's ancient urban planning and civilization.

#### About World Heritage Committee

- **Affiliation:** United Nations Educational, Scientific, and Cultural Organization (UNESCO)
- **Responsibilities:**
  - Implements the World Heritage Convention.
  - Defines the use of the World Heritage Fund.
  - Allocates financial assistance upon requests from States Parties.
  - Makes final decisions on whether a property is inscribed on the World Heritage List.
  - Examines reports on the state of conservation of inscribed properties.
  - Directs States Parties to take corrective action for poorly managed properties.
  - Decides on the inscription or removal of properties on the List of World Heritage in Danger.

#### Structure of the Committee

- **Composition:**
  - Consists of representatives from 21 States Parties to the Convention.
  - Members are elected by the General Assembly of States Parties.
  - Each member serves a term of six years, though many voluntarily serve for four years to allow rotation.
- **Bureau of the World Heritage Committee:**
  - The Bureau comprises seven States Parties elected annually by the Committee:
    - Chairperson
    - Five Vice-Chairpersons
    - Rapporteur
  - The Bureau coordinates the Committee's activities.
  - Sets the schedule and agenda for meetings.

#### World Heritage Convention

The World Heritage Convention, officially the Convention Concerning the Protection of the World Cultural and Natural Heritage, was adopted in 1972 at the UNESCO General Conference in Paris, France.

- It came into force in 1975.
- India ratified the convention in 1977.
- **Purpose:**
  - The convention aims to promote international cooperation to protect heritage sites of outstanding universal value for current and future generations.
- **State Parties:**
  - Currently, there are 194 State Parties to the convention.
  - State Parties identify and nominate properties in their countries for inscription on the World Heritage List.

- They agree to protect, preserve, and conserve these heritage properties.
- **Obligations of State Parties:**
  - Adopt a general policy integrating cultural and natural heritage protection into comprehensive planning programs.
  - Undertake legal, scientific, technical, administrative, and financial measures for the identification, protection, conservation, presentation, and rehabilitation of heritage properties.
  - Refrain from deliberate measures that might damage the cultural and natural heritage of other Parties.
  - Assist other Parties in the identification and protection of their heritage properties.
- **Management and Reporting:**
  - State Parties must present plans for the upkeep of inscribed properties and report periodically on their conditions.
- **Integration of Conservation Concepts:**
  - The World Heritage Convention links nature conservation with the preservation of cultural properties.
  - It acknowledges the interaction between people and nature and the need to maintain a balance between nature and humanity.

## Bhojshala Temple-Kamal Maula Mosque Complex

### Sub : History

#### Sec: Art and Culture

**Context:** The Archaeological Survey of India (ASI) recently submitted a report to the high court stating that the existing mosque structure was **built using parts of earlier temples**.

- This issue gained prominence after a petition was filed in the **high court** demanding the complex be handed over to **Hindus, with Muslims barred from offering prayers**.

#### Archaeological Insights

- The reuse of temple parts in the **mosque was documented as early as 1908** in the Dhar Gazetteer, indicating that the issue is not new.
- The ASI's report highlighted those pillars and pilaster in the **mosque's colonnades** originally belonged to temples, with carvings of deities defaced to adhere to Islamic architectural norms.
- The complex has been under **ASI's control since 1951**, designated as a monument of national importance, and special worship days were established for Hindus and Muslims through a 1995 agreement.

#### What is the Bhojshala Temple-Kamal Maula Mosque Complex?

- **Historical Background**
  - **Origins and Patronage:** The complex was originally a temple dedicated to goddess Sarasvati, believed to have been built by **King Bhoja of the Paramara dynasty in the 11th century AD**.
    - **King Bhoja** is noted for his patronage of art, literature, and education, with the establishment of a school known as Bhojashala.
  - **Structural Conversion:** Over time, the temple was transformed into a **mosque, with the mosque structure** incorporating structural elements from the original temple.
    - The complex also **retains slabs inscribed with Sanskrit and Prakrit** literary works, highlighting its historical and cultural significance.
- **Current Dispute**
  - **Controversy Over Original Status:** The dispute centres on whether the site originally served as a **Hindu temple or was solely established** as a mosque. Hindutva groups claim that the original Bhojshala and Vagdevi temples were demolished to construct the mosque.
  - **Petition and ASI Report:** A petition was filed citing an ASI report that allegedly supports claims of temple demolition.
    - The petitioner sought a thorough survey to ascertain the site's true historical identity.
  - **Legal Challenge:** One respondent argued against the petition's maintainability, citing the principle of res judicata, as a similar petition was dismissed by the **High Court's Principal Bench in 2003**.
- **High Court's Directive**
  - **Nature of the Monument:** The High Court acknowledged the need to definitively establish the monument's historical and religious nature.

- It emphasised the importance of **clarifying this ambiguity**, given the cultural and religious significance attached to the site.
- **ASI's Mandate:** The court mandated the ASI to conduct a comprehensive scientific survey, excavation, and investigation using advanced methods such as GPR-GPS (Ground Penetrating Radar-Global Positioning System) and carbon dating.
  - This survey is to encompass not only the main site but also a 50-metre peripheral ring area surrounding it.
- **Monument Act, 1958:** The ASI's role is pivotal under the Monument Act, 1958, in preserving and accurately documenting the cultural heritage of the site.

### Who was Raja Bhoj of the Gurjara-Pratihara Dynasty?

**Raja Bhoj I, also known as Mihir Bhoj**, was a significant ruler of the **Gurjara-Pratihara dynasty** in mediaeval India. Here are the key details about his life and reign:

- **Early Life and Rise to Power**
  - **Dynastic Background:** Bhoj I was the grandson of Nagabhata II, belonging to the Gurjara-Pratihara dynasty which came to prominence in the 8th century AD.
  - **Ascension to Throne:** He ascended to the throne in 836 AD and ruled for over 46 years, making him one of the longest-reigning kings of his dynasty.
- **Military and Political Achievements**
  - **Military Prowess:** Under his rule, the Gurjara-Pratiharas became known for their strong cavalry, which was noted by Arab travellers of the time.
  - **Tripartite Struggle:** Bhoj I engaged in the tripartite struggle for dominance in northern India against the Palas and Rashtrakutas. His victories over the Pala king Devapala and the Rashtrakuta king Amoghavarsha solidified his empire's dominance in the Kannauj, Malwa, and upper Ganga valley regions.
  - **Capital and Administration:** Kannauj, also known as Mahodaya, served as the capital of his empire. He reorganised and consolidated the territories inherited from his predecessors, ushering in a period of prosperity for the Pratiharas.
- **Cultural and Religious Contributions**
  - **Religious Affiliation:** Bhoj I was a devoted follower of Vaishnavism, a sect within Hinduism. He assumed the title of "Adivaraha," indicating his devotion to the god Varaha, an incarnation of Lord Vishnu.
  - **Title and Recognition:** Arab travellers, such as Al-Masudi, referred to him with the title "King Baura," recognizing his stature and influence beyond the Indian subcontinent.
- **Legacy**
  - **Historical Significance:** Bhoj I is remembered as one of the greatest emperors of the Gurjara-Pratihara dynasty, credited with expanding and consolidating their empire during his long and prosperous reign.
  - **Acknowledgment of Supremacy:** Various neighbouring kingdoms, including the Arabs of Sindh and the Kalachuris, acknowledged his supremacy, highlighting the extent of his influence in mediaeval India.

### Ahom 'Moidam'

#### Sub : History

#### Sec: Art and Culture

**Context:** The Ahom era 'Moidams' in Assam's Charaideo district have been recommended for inclusion in the UNESCO World Heritage List by the International Council on Monuments and Sites (ICOMOS).

- **Ahom Era Moidams**
  - **Location:** Situated in Assam's Charaideo district.
  - **Historical Context:** Burial grounds of rulers of the Ahom kingdom, established in the 13th century by Chaulung Siu-ka-pha, the founder of the Ahom kingdom. The first capital was established at **Che-rai-doi or Charaideo**, located at the foothills of the **Patkai hills**.
- **Architectural Features**
  - **Structure:** The Moidams are often compared to the pyramids of Egypt.
  - **Exterior:** Hemispherical shape; size varies based on the rank and status of the person buried.
- **Components:**
  - **Vaulted Chamber:** Contains a centrally raised platform where the body was placed.
  - **Hemispherical Earthen Mound:** Covers the chamber, with a **brick structure called "Chaw-chali."**
  - **Octagonal Boundary Wall:** Surrounds the base of the mound, featuring an arched gateway on the west side.

- **Burial Customs**
  - **Objects Buried:** Objects used by the deceased during their lifetime, such as royal insignia, items made of wood, ivory, iron, gold pendants, etc., were buried with them.
  - **Construction Materials:** Described in the **Changrung Phukan** (canonical text developed by the Ahoms), construction materials included wood, stone, and burnt bricks.
- **Significance and UNESCO Recommendation**
  - **Cultural Importance:** Represents the funerary practices and architectural achievements of the Ahom dynasty.
  - **Comparison to Egyptian Pyramids:** Highlighted for their architectural uniqueness and cultural significance.
  - **ICOMOS Recommendation:** As an advisory body to UNESCO, ICOMOS plays a crucial role in evaluating and recommending cultural sites for inclusion in the UNESCO World Heritage List.
  - Their recommendation underscores the global importance of the Ahom Era Moidams as a significant cultural heritage site.

#### International Council on Monuments and Sites (ICOMOS)

- **Establishment:** Founded in 1965 in Warsaw, Poland.
- **Purpose:**
  - Dedicated to the conservation and enhancement of architectural, archaeological, and landscape heritage worldwide.
  - Focuses on promoting the preservation and sustainable use of monuments, sites, and landscapes of historical, cultural, and architectural significance.
- **Role:**
  - **Advisory to UNESCO:** Serves as an advisory body to the UNESCO World Heritage Committee.
    - Evaluates cultural and natural heritage sites nominated for inclusion in the UNESCO World Heritage List.
    - Provides recommendations on the conservation and management of World Heritage Sites.
  - **Expertise and Advocacy:** Offers expertise in heritage conservation, restoration techniques, and cultural heritage management.
  - **Global Network:** Operates through national and international committees, bringing together professionals, experts, and organizations dedicated to heritage conservation.
- **Objectives:**
  - Promote international cooperation in the conservation and management of cultural heritage.
  - Foster research, education, and advocacy in the field of heritage conservation.
  - Develop guidelines and charters for the preservation and sustainable management of monuments and sites.
  - Raise awareness about the importance of cultural heritage and its preservation for future generations.

#### Wagh Nakh

##### Sub : History

##### Sec: Art and Culture

**Context:** The Cultural Affairs Ministry of Maharashtra has finalised a memorandum of understanding (MoU) with the Victoria and Albert Museum in London to bring back Chhatrapati Shivaji Maharaj's iconic "Wagh Nakh" weapon to the state.

- According to the MoU, the antique weapon, known as the "Wagh Nakh," will be loaned to the Government of Maharashtra by the Victoria and Albert Museum. The loan period is set for three years.

#### What is the 'Wagh Nakh'?



Image: Wagh Nakh

**Weapon Description:** The Wagh Nakh translates to 'tiger claws' in English. It is a medieval dagger unique to the Indian subcontinent. The weapon typically features four or five curved blades that are attached to a glove or a bar. This design allows the wearer to conceal the blades until they are ready to strike, making it suitable for personal defense or stealth attacks.

**Functionality:** The sharp, curved blades of the Wagh Nakh were designed to slice through skin and flesh with ease, making it a formidable weapon in close combat situations.

**Historical Context - Shivaji Maharaj:** Chhatrapati Shivaji Maharaj, a prominent figure in Indian history, famously used the Wagh Nakh in a crucial encounter with Afzal Khan, a general from the Bijapur Sultanate. Khan, sent to halt Shivaji's growing influence in the Konkan region, proposed a peaceful meeting as a ruse. Shivaji, anticipating treachery, wore chainmail armor beneath his clothing and concealed a Wagh Nakh.

**Encounter with Afzal Khan:** During their meeting, Afzal Khan attempted to embrace Shivaji in a gesture of deceit. In response, Shivaji used the Wagh Nakh concealed in his hand to strike Khan, fatally injuring him. This decisive action secured Shivaji's victory and solidified his reputation as a skilled military strategist and leader.

**Legacy:** The story of Shivaji Maharaj's use of the Wagh Nakh against Afzal Khan has become emblematic of his bravery and tactical acumen. The Wagh Nakh itself remains a symbol of his defense and strategic preparedness in the face of danger.

#### How did Wagh Nakh reach London?

- **James Grant Duff:** James Grant Duff (1789-1858) served as the East India Company Resident (political agent) of the Satara State from 1818 to 1822.
  - He was not only a political figure but also an amateur historian who authored "A History of the Mahrattas" in 1826, which remains a significant work in Maratha history.
- **Acquisition of the Wagh Nakh:** During his tenure as Resident at Satara, Grant Duff received the Wagh Nakh as a gift.
  - The inscription on the case of the weapon states: "The 'Wagnuck' of Sivajee With Which He Killed the Moghul General."
  - This Relic was given to Mr. James Grant-Duff of Eden When he was Resident at Satara By the Prime Minister of the Peshwa of the Marathas."
- **Historical Significance:** The Wagh Nakh was purportedly used by Chhatrapati Shivaji Maharaj to kill Afzal Khan, a pivotal event in Shivaji's military career.
  - The association of this weapon with such a significant historical figure adds to its cultural and historical importance.
- **Transition to Britain:** Grant Duff, upon returning to Scotland, had a fitted case made for the Wagh Nakh. This case, with its inscription detailing its historical context, accompanied the weapon to Britain.
  - It is likely that Grant Duff's role as Resident at Satara during the transitional period of Maratha territories to British control facilitated his possession of the weapon.
- **Presence in the Victoria and Albert Museum:** The Wagh Nakh eventually found its way to the Victoria and Albert Museum in London, where it is now housed as part of their extensive collection of historical artefacts.

#### Samayapuram Mariamman Temple

**Sub : History**

**Sec: Art and Culture**



**Context:** The Hindu Group of Publications recently launched a coffee-table book titled "Samayapuram — The Sacred Seat of Shakti" at a ceremony held at the Samayapuram temple near Trichy.

### **About the Book**

- The book is authored by **Vrinda Ramanan**, a qualified Bharatanatyam dancer and teacher, and J. Ramanan, a practising architect.
- The **190-page book delves into every** aspect associated with Goddess Mariamman, who is revered in Samayapuram village.
- It is divided into sections that cover various topics such as the mythology and ancient legends surrounding **Goddess Mariamman**, details about the temple's festive celebrations, rituals like **pujas and abhishekam performed to the deity, descriptions of the** sacred theerthams (holy water sources), and the profound devotion exhibited by the devotees.

### **Background of the Temple**

- **Origin and location**
  - Name: Arulmigu Sri Mariamman Temple, Samayapuram
  - Location: Tiruchirappalli district, Tamil Nadu, India
  - Main Deity: Samayapuram Mariamman, a form of Adi Parashakti and Mariamman
  - Made of sand and clay with medicinal herbs, not traditional stone idols
  - Considered highly powerful; no abhishekams (sacred bathing) to the main deity
- **Rituals and Offerings**
  - Abhishekam conducted to a small stone statue in front of the main deity
  - Devotees offer mavalakku (sweet dish made of jaggery, rice flour, and ghee)
  - Offerings of raw salt and neem leaves are also common
- **Devotional Practices**
  - Thousands visit on Sundays, Tuesdays, and Fridays (holy days for Mariamman)
  - Popular belief in the region attributes immense powers to local deities like Mariamman
- **Early History:**
  - Unclear historical records; local worship likely existed for centuries
  - Legend: Original deity was at Sri Ranganathaswamy Temple, Srirangam, moved due to beliefs about causing illness
  - King Vijayaraya Chakravarti II constructed the present-day temple structure
- **Wealth and Administration**
  - Second wealthiest temple in Tamil Nadu after Palani in terms of cash flows.
  - Managed by the Hindu Religious and Charitable Endowments Department of the Government of Tamil Nadu
- **Architecture:**
  - Features a gold-plated vimana over the sanctum and received a new utsava murti idol made of panchaloha in 1991

### **Anand Marriage Act**

#### **Sub : History**

#### **Sec: Modern India**

**Context:** The National Commission for Minorities recently held a video conference meeting with delegates from 18 states and union territories, presided over by the Commission's Chairman. The meeting's goal was to examine the implementation and registration of Sikh marriages under the Anand Marriage Act.

#### **About Anand Marriage Act**

- **Enactment:**
  - The Anand Marriage Act was passed in 1909 in India.
  - It is a specific legal enactment designed primarily for the Sikh community.
- **Purpose:**
  - The Act was enacted to provide separate legal recognition for Sikh marriages.
  - Before the enactment of this law, Sikh marriages were registered under the Hindu Marriage Act, which did not fully cater to Sikh religious practices.
- **Recognition of Sikh Marriages:**

- The Sikh community sought distinct legal recognition for their marriage rituals, particularly the Anand Karaj ceremony.
- The Anand Karaj is a Sikh marriage ceremony that involves the couple taking vows before the Guru Granth Sahib (the holy scripture of Sikhism).

### Key Features of the Anand Marriage Act

- **Legal Recognition of Sikh Marriages:**
  - The **Anand Marriage Act** officially recognizes Sikh marriage ceremonies, specifically the **Anand Karaj**, as a **valid** form of marriage under Indian law.
  - This recognition ensures that **Sikh marriages** conducted according to their religious rituals are legally binding and protected.
- **Affirmation of Sikh Identity:**
  - The Act was a significant step towards acknowledging and legitimising the distinct religious and cultural identity of the **Sikh community in India**.
  - It ensures that Sikh matrimonial practices, including the Anand Karaj ceremony, are respected and protected under the law.
- **Registration of Marriages:**
  - Initially, the 1909 Act did not mandate the registration of Sikh marriages.
  - Subsequent amendments and legal provisions have facilitated the registration process, providing legal clarity and security for Sikh couples.
  - **Registration under the Anand Marriage Act** ensures that marriages are recognized by governmental and legal authorities, offering benefits and protections to the married couple.
- **Cultural and Religious Significance:**
  - The Act acknowledges the cultural and religious significance of the **Anand Karaj ceremony within Sikhism**.
  - It recognizes the central role of this ceremony in Sikh matrimonial traditions, reflecting the community's unique religious practices and beliefs.

### Significance and Evolution

- **Landmark Legislation:**
  - The Anand Marriage Act is a **landmark legislation that affirms** the autonomy and distinctiveness of Sikh marriage customs within the broader framework of Indian matrimonial laws.
- **Amendments and Demands:**
  - Over time, there have been discussions and demands for amendments to the Act to address **contemporary legal issues**.
  - These include provisions related to divorce, alimony, and ensuring a streamlined registration process that meets modern legal standards while respecting Sikh traditions.
- **Recent Implementation:**
  - In 2023, the **Anand Marriage Act** was implemented in **Jammu & Kashmir, extending its legal coverage to this region**.
  - This implementation ensures that Sikh marriages conducted in Jammu & Kashmir are now recognized and registered under the Anand Marriage Act, providing consistency and **legal security across different states and union territories of India**.

## Rashtrapati Bhavan Halls Renamed to Reflect Indian Cultural Values

### Sub : History

#### Sec: Modern India

**Context:** President Droupadi Murmu has approved the renaming of Durbar Hall to Ganatantra Mandap and Ashok Hall to Ashok Mandap in Rashtrapati Bhavan. This change aims to better reflect India's democratic values and cultural heritage.

#### About Renaming of Halls

In an effort to embrace Indian cultural values and eliminate remnants of colonial influence, Rashtrapati Bhavan has officially renamed two of its prominent halls.

- **Durbar Hall** is now **Ganatantra Mandap**, reflecting the concept of the Republic and replacing the colonial term 'Durbar' (which referred to the courts and assemblies of Indian rulers and the British).
- **Ashok Hall has been renamed Ashok Mandap**, in honour of Emperor Ashoka and his cultural significance. This change seeks to remove anglicised influences and align with the ethos associated with the word 'Ashok.' According to Rashtrapati Bhavan, Ashok Hall was originally a ballroom.

- The name '**Ashok**' signifies **freedom** from suffering or sorrow and also pays tribute to Emperor Ashok, a symbol of unity and peaceful coexistence.
- Additionally, the Ashok tree holds deep significance in Indian religious traditions, arts, and culture.

### About Rashtrapati Bhavan

- Rashtrapati Bhavan in New Delhi is the **largest residence of any Head of State** in the world. It was initially constructed as the '**Viceroy House**' for the **British Viceroy of India** and was later renamed **Rashtrapati Bhavan** when India became a Republic in 1950.
- Designed by **British architect Sir Edwin Landseer Lutyens**, the structure combines Indian, Mughal, and European architectural styles.
- In 2023, the renowned Mughal **Gardens at Rashtrapati Bhavan were also renamed Amrit Udyan**.
- Earlier, in 2022, the **Prime Minister inaugurated the 'Kartavya Path'**, symbolising a shift from the **former Rajpath, an icon of power, to Kartavya Path**, representing public ownership and empowerment.

## Order of Saint Andrew the Apostle

### Sub : History

#### Sec: Medieval History

**Context:** The Prime Minister of India was awarded Russia's highest civilian honour, the Order of Saint Andrew the Apostle, during his visit to the country.

#### About the Order of Saint Andrew the Apostle

- **Establishment:**
  - Founded in 1698 by Tsar Peter the Great.
  - Reinstated in 1998 after being abolished in 1918 post-Russian Revolution.
- **Namesake:**
  - Named after Saint Andrew, **one of Jesus's apostles**.
  - Saint Andrew travelled widely, including to Russia, Greece, and other parts of Europe and Asia.
  - Founded the **Church of Constantinople**, influencing the Russian Orthodox Church.

#### Criteria for Award

- **Given for:**
  - Exceptional services to Russia by **prominent government officials, military leaders, scientists, artists, and individuals** across various sectors.
  - Outstanding contributions to the **Russian Federation by foreign heads of state**.

#### Previous Recipients

- **Russian Recipients:**
  - Mikhail Kalashnikov (designer of the AK-47).
  - Sergey Mikhalkov (renowned author).
  - Mikhail Gorbachev (last leader of the Soviet Union).
  - Patriarchs Alexy II and Kirill of the Russian Orthodox Church.
- **Foreign Recipients:**
  - Xi Jinping (President of China).
  - Nursultan Nazarbayev (Former President of Kazakhstan).

#### Significance of the Award

- **Geopolitical Relations:**
  - Reflects current geopolitical relations between Russia and India.
  - Emphasizes mutual cooperation and diplomatic achievements.
- **Cultural Diplomacy:**
  - Highlights the role of cultural diplomacy in fostering international alliances and recognition.
- **Bilateral Relations:**
  - Acknowledges India's contributions to strengthening **bilateral ties with Russia**.
  - Recognizes efforts in enhancing the Russo-Indian relationship.

## Why Europe's late stone age population crashed

### Sub : History

#### Sec: Ancient History

**Context:** Recently a new study, 'Repeated plague infections across six generations of Neolithic Farmers', published by the journal Nature, suggests that disease, specifically the plague, may have been the primary driver.

#### About the Plague waves in Europe

- **Genetic Analysis:** Researchers analysed DNA from human remains (bones and teeth) dating back to the Neolithic period in Scandinavia.
  - They focused on samples from burial sites in Sweden (Falbygden and coastal areas) and Denmark, totaling 108 individuals.
- **Prevalence of Plague:** They found that a significant portion (17%) of the sampled individuals were infected with plague at the time of their death.
  - In the Falbygden area, where they could reconstruct family trees spanning six generations (about 120 years), 32% of individuals were infected.
- **Multiple Plague Waves:** The study identified three distinct waves of plague infections among the studied population. They reconstructed the genomes of the plague strains responsible for these outbreaks.
- **Impact of Plague:** The last wave of plague, possibly a more virulent strain, showed evidence of person-to-person transmission, indicating epidemic spread.
  - This earlier form of plague is an ancestor to the strains that caused later devastating epidemics like the Justinian Plague (6th century AD) and the Black Death (14th century AD).
- **Neolithic Population Decline:** The high prevalence of plague detected suggests that these epidemics contributed significantly to the decline of the Neolithic population in Northern Europe between approximately 3300 BCE to 2900 BCE.
  - This period saw the abandonment or reduction of farming communities, leading to a demographic collapse.
- **Replacement by Yamnaya People:** Following this decline, the populations of Scandinavia and Northwestern Europe were replaced by migrations of Yamnaya people from the Ukrainian steppe, who are considered ancestors of modern Northern Europeans.

#### Conclusion

- The findings underscore the role of infectious disease, specifically plague, as a major factor in shaping the demographic history of early agricultural societies in Europe.
- The study not only provides insights into ancient epidemiology but also highlights how disease outbreaks can have profound and lasting impacts on human populations, influencing cultural and genetic evolution.

## Abdul Hamid

### Sub : History

#### Sec : Modern India

**Context:** Recently **Rashtriya Swayamsevak Sangh** chief **Mohan Bhagwat** visited the native village of Hamid, Dhamupur, where he released a book on Hamid titled 'Mere Papa Paramvir' and another book titled 'Bharat ka Musalman'.

#### Background of Abdul Hamid

- **Birth:** Born on July 1, 1933.
- **Service:** Company Quarter Master Havildar (CQMH) in the 4th Grenadiers Battalion of the Indian Army.

#### Battle of Asal Uttar: Overview and Context

- **Date:** Fought between September 8 to September 10, 1965, during the India-Pakistan War of 1965.
- **Location:** Near Khem Karan in Punjab, close to the India-Pakistan border.
- **Pakistani Offensive:** Pakistan's 1 Armoured Division launched an offensive to capture Khem Karan and cut off parts of Punjab, including Amritsar, from India.

#### Indian Response and Strategic Moves

- **Initial Surprise:** India's 4th Mountain Division, near Khem Karan, initially fell back in the face of the Pakistani offensive.
- **Leadership and Defence Strategy:** Lt Gen Harbaksh Singh, Western Army Commander, advised a stout defence at Asal Uttar and moved the 2nd Armoured Brigade to counter Pakistani tanks.
- **Outcome:** The battle resulted in heavy losses for Pakistan, including 97 Patton tanks and the surrender of an entire armoured regiment and its commanding officer.

### Abdul Hamid's Heroic Contribution

- **Role and Actions:** Serving with the 4th Grenadiers Battalion, Hamid led a detachment of Recoilless Guns near Chima village, tasked with hunting enemy tanks.
- **Bravery and Sacrifice:** On September 10, Hamid engaged and destroyed four Pakistani Patton tanks at close range, disabling one despite coming under fire from another tank.
- **Recognition:** Posthumously awarded the Param Vir Chakra, India's highest gallantry award.

### Legacy and Commemoration

- **War Memorial:** The site of Hamid's death is now a war memorial.
- **Tribute:** A captured Pakistani Patton tank stands at the memorial's entrance, turret down, honouring the bravery of Indian soldiers in the Battle of Asal Uttar.

It encapsulates the bravery and strategic significance of Abdul Hamid's actions during the Battle of Asal Uttar, highlighting his role in India's successful defence against Pakistani forces during the 1965 war.

## IR

### India and Russia to boost bilateral trade to \$100 billion by 2030

#### Sub : IR

#### Sec: Bilateral relations

#### Context:

- **India and Russia** agreed to **increase bilateral trade to \$100 billion by 2030** and **use national currencies to bypass Western sanctions**.
- This decision was made during the **22nd Annual Summit**, the first meeting between **Modi and Putin** since the **Ukraine war began**.

#### Details:

- **Modi** accepted **Russia's highest civilian honour**, the **Order of St. Andrew the Apostle** (announced in **2019**, but received now), and was invited to the **"Extended BRICS" summit in Kazan in October 2024**.
- **Putin** agreed to expedite the **discharge of Indians recruited by the Russian military**, although this was not included in the joint statement.
- The **joint statement** emphasized a **peaceful resolution** of the **Ukraine conflict**, appreciating **mediation proposals**.

#### Trade Target Achievability:

- The **\$100 billion trade target** is considered **achievable**, with **current trade** at around **\$65 billion** due to **India's increased imports of discounted Russian crude oil**.
  - **Russia-India trade** grew by **66% in 2023** and **20%** just in the **first quarter of 2024**.
- This **trade level** would place **India-Russia trade** on par with **India's trade with the U.S., China, and the EU**.

#### Cooperation and Economic Vision:

- The leaders **agreed on cooperation projects in Russia's Far East** and issued a **joint vision statement on trade and economic cooperation**.
- The **vision** covered **nine areas** including the development of a **"bilateral settlement system using national currencies"**, ironing out customs procedures and using **new connectivity routes**, including the **Chennai-Vladivostok maritime route** and **Northern Sea Route** and the **International North-South Transport Corridor via Iran**, **investments in the energy sector** including **nuclear energy, infrastructure development** and **investment promotion** as **"priority areas"**.
- Several **MoUs** were signed on **climate change, polar research, legal arbitration, and pharmaceutical certification**.
- **Russia** agreed to **open two new consulates in Kazan and Yekaterinburg** for the **Indian diaspora**.
- During the **2019** visit, Prime Minister Narendra Modi signed a **Memorandum of Intent (MoI)** on the **'Development of Maritime Communications between the Port of Vladivostok and the Port of Chennai'**.
- The **Vladivostok – Chennai route** passes through the **Sea of Japan, the South China Sea and Malacca Strait**.
- The route will bring down transport time to **12 days**, almost a **third of what is taken under the existing popular route** that covers **St Petersburg to Mumbai**.
  - The current maritime route, **St Petersburg to Mumbai**, is said to be an **8,675 nautical mile (16,000 km)** one.
  - Against this, the proposed **Vladivostok – Chennai route** is said to be **5647 nautical miles (10,500 km)** long.
- Costs are expected to reduce by **30%**.
- **Significance of the new route:**



- The new route would also give India access to the Far East, including countries like Mongolia, and the largest presence in the South East Asian region.
- While **export from Russia** could include **coal, crude oil and LNG**, apart from commodities like **apples and kiwis.**; **shipments from India** could include **construction equipment, construction materials, and pharma**, among others.

## Ivory Coast joins UN Water Convention as 10th African nation

**Subject: IR**

**Sec: Int conventions**

**Context:**

- Ivory Coast joined the United Nations Water Convention, becoming the 10th African nation. In **2024**, at least three more **African nations**, which include **Sierra Leone, Zambia and Zimbabwe**, are in the **final stages of accession and joining the convention**.

**More about News:**

- Ivory Coast joined the convention to **enhance cooperative water management across borders** in response to **growing water stress** and the **effects of climate change on the water resources it shares with its neighbours**.
- It is now the **53rd Party (country) to the 1992 UN Water Convention**, which is also known as the **Convention on the Protection and Use of Transboundary Watercourses and International Lakes**.

**UN Water Convention:**

- The Convention was initially established as a **regional framework** for the **pan-European region**.
- Ivory Coast shares **eight transboundary river basins (Black Volta, Bia, Tanoe, Comoe, Niger, Sassandra, Cavally et Nuon)** with **six of its neighbours**, which include **Ghana, Burkina Faso, Mali, Guinea, Liberia, and Sierra Leone**.
- **Niger basin**, which is the **continent's third-longest river at 4,200 kilometres and traverses nine countries (Benin, Burkina Faso, Cameroon, Chad, Ivory Coast, Guinea, Mali, Niger, and Nigeria)**, is one of Africa's most **vulnerable regions to climate change**.
- **Niger River basin** is the **largest decrease in river flows** in all of Africa due to **climate change**, according to a recent study titled *Combined impacts of climate and land-use change on future water resources in Africa* published in the journal **Hydrology and Earth System Sciences** on **8 January 2024**.
- Under the convention, the **parties (or nations)** are required to cooperate for the **sustainable management of transboundary waters**.
- While all **54 countries are facing water insecurity**, Ivory Coast is categorised as the **40th “water insecure country in the continent”**, according to the **Global Water Security 2023 Assessment**.
- Meeting the **water needs of the country's 30 million residents**, whose population is growing by **5 per cent annually**, presents numerous challenges. The **region's water supplies are threatened by urbanisation, climate change effects such as drought and flooding, and pollution from industrial and agricultural waste, illicit gold panning, and untreated wastewater**, stated the **United Nations Economic Commission for Europe (UNECE)**, which services the **UN Water Convention**.
- In the context of **increasing water scarcity and high demand for water in Africa**, **Cote d'Ivoire's accession as the 10th African Party to the 1992 Water Convention** is a significant step for the continent.
- **No transboundary aquifers shared by the country** are covered by operational arrangements, shows the **UN portal on SDG 6**.

**Sustainable Development Goal (SDG) 6:**

- Ensure **access to water and sanitation for all**. Access to **safe water, sanitation and hygiene** is the most basic **human need for health and well-being**. Billions of people will **lack access to these basic services in 2030 unless progress quadruples**.

**Significant for Africa:**

- Potential to stimulate **economic growth, secure livelihoods, and alleviate poverty**.
- **Transboundary water (TBW) resources**, where **63 international transboundary river basins cover about 62 per cent of the region's land area** and account for **90 per cent of the total surface water**.
- Development in Ivory Coast **strengthens the continent's strong momentum for water**
- **Cote d'Ivoire's accession** is a milestone for **multilateralism and reaffirms the role of the UN Water Convention as a tool to support water cooperation for peace, sustainable development, and climate change adaptation across borders**.



## India hosts BIMSTEC Foreign Ministers amid raging Myanmar crisis

**Sub: IR**

**Sec: Int grouping**

**Context:**

- **External Affairs Minister S. Jaishankar** emphasised that **BIMSTEC** should find solutions to regional challenges within its framework during the **2nd BIMSTEC Foreign Ministers' retreat** on July 11 in **New Delhi**.
- **The first edition** was held in **Bangkok, Thailand** in

**Details:**

- This **retreat** is the **first event** since the **BIMSTEC Charter** came into effect on **May 20**, marking a significant milestone for the organization. The meeting is significant due to recent developments in **Myanmar**, where the **military junta** is facing setbacks against **Ethnic Armed Organisations (EAOs)**, affecting regional projects.
- **Instability in Myanmar** threatens **developmental and connectivity projects** among **BIMSTEC countries** like **Nepal, Bhutan, India, Bangladesh, Myanmar, and Thailand**.

**About BIMSTEC:**

- **BIMSTEC** is a **regional organisation** comprising **7 member states** - **Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, and**
- It was formed in **1997** with the **aim of promoting multifaceted technical and economic cooperation** among the **countries of the Bay of Bengal region**.
- The region covered by **BIMSTEC** is home to around **5 billion people**, with a **combined GDP of over USD 3.8 trillion**.
- The **BIMSTEC Charter** was signed and adopted during the **Fifth BIMSTEC Summit** held in virtual format in **Colombo, Sri Lanka**, on 30 March 2022. It came into force on **20 May 2024**.
- **Origin:**
  - The sub-regional organisation was established in **1997** with the adoption of the **Bangkok Declaration**.
  - Initially consisting of **4 Member States**, it was known as **'BIST-EC'** (Bangladesh, India, Sri-Lanka and Thailand Economic Cooperation).
  - In **1997**, it was renamed **'BIMST-EC'** after **Myanmar**
  - The admission of **Nepal** and **Bhutan** in **2004** led to another name change to the **'Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation'** (**BIMSTEC**).

**Key Features of the BIMSTEC Charter:**

- **International Recognition:** **BIMSTEC** gains official standing as a **legal entity**, allowing it to interact directly with other international organisations on matters of diplomacy and cooperation.
- **Shared Goals:** The Charter outlines **BIMSTEC's objectives**, which focus on **building trust and friendly relations** among member states, and accelerating economic development and social progress in the Bay of Bengal region.
- **Structured Organisation:** A clear framework is established for **BIMSTEC's operation**, outlining regular meetings at the Summit, Ministerial, and Senior Officials' levels.
- **Expanding Membership:** The Charter paves the way for future growth by allowing new countries to join **BIMSTEC** and for other nations to participate as observers.
- **Re-constitution and reduction** in the number of sectors of cooperation to **7** and each member-state will serve as a lead for a sector.
  - **Bangladesh** in **Trade, investment and development**; **Bhutan** in **environment and climate change**; **India** in **security, including energy**; **Myanmar** in **agriculture and food security**; **Nepal** in **people-to-people contacts**; **Sri Lanka** in **science, technology and innovation** and **Thailand** in **connectivity**.

## 'Patriots for Europe': Hungary's Orban announces new EU Parliament alliance

**Sub: IR**

**Sec: Int grouping**

**Context:**

- **Austria's far-right Freedom Party (FPO)**, **Hungary's Prime Minister Viktor Orban's Fidesz**, and the **Czech ANO party led by Andrej Babis** are forming a **new alliance** in the **European Parliament**, called **"Patriots for Europe."**

**About the new alliance- "Patriots for Europe":**

- The alliance **requires backing** from parties in **at least a quarter** of the **EU's 27 member states** to be **officially recognized**.
- The three leaders signed a **"patriotic manifesto"** promising **"peace, security and development"** as opposed to the **"war, migration and stagnation"** they attribute to the **"Brussels elite."**

- **FPO** is currently part of the **Identity and Democracy group**, while ANO recently left **Renew Europe**. **Fidesz** has remained outside larger groupings since leaving the **European People's Party (EPP)** in 2021.
- This **new alliance coincides** with **Hungary** taking over the **six-month rotating presidency of the EU**, during which it can **influence the agenda**, despite having little real power.
  - **Hungary** has been known to **block or delay key EU decisions**, including those on **Ukraine, Russia**, and
- **Orban's presidency motto**, "**Make Europe Great Again**," has caused concern among **European politicians**.
- The formation of this alliance follows gains by **nationalist parties** in recent **European Parliament elections**, where they capitalized on voter concerns over **rising prices, migration**, and the **green transition**.

### IPEF: India likely to sign clean, fair economy pacts

#### Sub: IR

#### Sec: Int groupings

#### Context:

- **India** is close to finalizing Cabinet notes for signing the **Clean Economy and Fair Economy agreements** under **IPEF**.
- The country is not ready to join the **trade pillar** due to concerns over **high-standard rules on the digital economy, data flows, data localization**, and **labour and environment issues**.
- **India** was the **only IPEF member** that **did not endorse the Clean and Fair Economy pacts** in June 2023 due to general elections.

#### About IPEF:

- The **IPEF**, launched by **US President Joe Biden** in **May 2022**, **aims** to counter China's influence in the Indo-Pacific.
- The **14-member IPEF** includes the **US, India, Australia, Brunei, Fiji, Indonesia, Japan, Korea, Malaysia, New Zealand, the Philippines, Singapore, Thailand, and Vietnam**.
- **IPEF Structure:**
  - **Four pillars: Trade, Supply Chains, Clean Energy, and Tax & Anti-Corruption.**
  - No provisions on tariff cuts on goods.
  - **All 14 members**, including **India**, have signed the **supply chains resilience agreement** effective from **February 24, 2024**.

#### Clean Economy Pact:

- Focuses on **energy security, climate resilience, GHG emissions mitigation**, and **reducing dependence on fossil fuels**.
- Promotes technical cooperation, workforce development, capacity building, and research collaborations.
- **India aims** to attract investments and concessional financing for clean energy projects.

#### Fair Economy Agreement:

- **Aims** to create a transparent and predictable business environment to boost trade and investment.
- Enhances anti-corruption frameworks, tax transparency, and information exchange for tax purposes.

#### Trade Pillar:

- Still under **negotiation**, with the **US** showing less interest in digital trade.
- **India opted out of trade pillar** negotiations early on.

### India to host UNESCO World Heritage Committee session in New Delhi from July 21

#### Sub: IR

#### Sec: Int org

#### UNESCO World Heritage Committee 46th Session:

- **Held at:** Bharat Mandapam, New Delhi, India
- **Organized by:** Archaeological Survey of India (ASI)
- **Participants:**
  - **Total Delegates:** Over 2,500 from 195 countries, including State Parties, advisory bodies, senior diplomats, heritage experts, scholars, and researchers

#### UNESCO World Heritage Committee:

- **Established:** November 16, **1972**
- **Comprises** representatives from **21 States Parties** to the **World Heritage Convention (1972)** elected by the **General Assembly of UNESCO**.
- **Previous Session:** The 45th session was held in **Riyadh, Saudi Arabia**

- **Purpose:** Implementation of the **World Heritage Convention**
- **Responsibilities:**
  - Allocates financial assistance from the **World Heritage Fund**
  - Decides on the inscription of sites on the **World Heritage List**
- **Last Rules of Procedure Revision: 39th session, Bonn, 2015**
- **Current Members (elected November 2023):**
  - Argentina, Belgium, Bulgaria, Greece, India, Italy, Jamaica, Japan, Kazakhstan, Kenya, Lebanon, Mexico, Qatar, Republic of Korea, Rwanda, Saint Vincent and the Grenadines, Senegal, Türkiye, Ukraine, Vietnam, Zambia

#### What is the World Heritage Convention?

- The **World Heritage Convention**, more accurately the **Convention Concerning the Protection of the World Cultural and Natural Heritage**, was adopted in **1972** at the **UNESCO General Conference in Paris, France**.
- It came into force in **1975**. **India** ratified the convention in **1977**.
- The convention **aims** to promote cooperation among countries to protect heritage all over the world that is of such outstanding universal value that its conservation is important for current and future generations.
- Currently, there are **194 State Parties** to the convention.
- **State Parties agree to:**
  - Adopt a general policy that aims to give the cultural and natural heritage a function in the life of the community and to integrate the protection of that heritage into comprehensive planning programs.
  - Undertake appropriate legal, scientific, technical, administrative and financial measures necessary for the identification, protection, conservation, presentation and rehabilitation of this heritage.
  - Refrain from ‘any deliberate measures which might damage, directly or indirectly, the cultural and natural heritage’ of other Parties to the Convention, and to help other Parties in the identification and protection of their properties.
- The **World Heritage Convention** links together in a single document the concepts of nature conservation and the preservation of cultural properties.

#### India's UNESCO World Heritage Sites:

- **Total Sites:** 42
- **Recent Addition:** Sacred Ensembles of the Hoysalas in Karnataka (42nd site), Santiniketan (41st site)

#### 75th anniversary of NATO on April 4 2024

**Sub: IR**

**Sec : Int org**

**Context:**

- 75th anniversary of NATO.
- **Secretary General Jens Stoltenberg** declared, “NATO is bigger, stronger, and more united than ever” with its **32 member-states**.
- **Challenges:** Despite the expansion, **NATO** faces challenges such as contributing to Russia’s 2022 invasion of Ukraine.

#### About NATO:

- **Founded: April 4, 1949**, with **12 members** (Belgium, Canada, Denmark, France, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, the UK, and the US).
  - Apart from the **original 12**, members include **Greece** and **Turkey** (1952); **West Germany** (1955; later as **Germany**); **Spain** (1982); **the Czech Republic, Hungary**, and **Poland** (1999); **Bulgaria, Estonia, Latvia, Lithuania, Romania, Slovakia**, and **Slovenia** (2004); **Albania** and **Croatia** (2009); **Montenegro** (2017); **North Macedonia** (2020); **Finland** (2023); and **Sweden** (2024).
- **Treaty Basis:** Washington Treaty, empowered by **Article 51** of the **UN Charter for collective defence**.
- **Core Principle:** Collective security – an attack on one member is an attack on all, requiring collective action.
- **Cold War Context:** Formed to counter **Soviet expansion** and **control in Europe**.
- **Article 5:** Invoked only after the **September 11, 2001 attacks**, leading to **NATO forces in Afghanistan**.
- **Structure:**
  - **Political Leadership:** The North Atlantic Council (NAC) serves as NATO's principal political decision-making body, composed of ambassadors from all member countries.

- **Military Command Structure:** NATO's military command structure includes Strategic Commands (e.g., Allied Command Operations) responsible for operational planning and execution, as well as Regional Commands and Force Headquarters.
- **Integrated Military Forces:** NATO maintains integrated military forces, allowing member countries to contribute personnel and assets to collective defence efforts under NATO command.

#### Current Challenges

- **Internal Tensions:**
  - Disagreements on **military spending**, with only a few members meeting the **2% GDP defence spending target**.
  - Conflicts over member state policies and strategic coordination (e.g., Turkey's resistance to Sweden and Finland's membership).
  - French President Macron noted strategic coordination issues between European allies and the US/Turkey.
- **Impact of Ukraine Conflict:**
  - Finland and Sweden's move towards NATO due to Russian aggression.
  - Disagreements on funding and support for Ukraine.
  - Stoltenberg proposed a \$107 billion fund for Ukraine and ensuring 18 NATO members meet the 2% spending limit by 2024, drawing mixed reactions.

#### Role of Rajasthan's tribal communities in meeting global challenges highlighted at U.N. event

**Subject: IR**

**Sec: Int Org**

**Context:**

The best practices of tribal communities highlighted at the forum included the production of local seeds, water conservation at source, use of animals in agriculture, checking soil erosion through mixed cropping, and the use of uncultivated food for nutritional security.

**More about News:**

- **Tribal women farmers in southern Rajasthan take a pledge to protect their traditional practices to advance the 2030 agenda for SDGs.**
- The solutions offered by **indigenous tribal communities in Rajasthan to global challenges, and their role in the execution of policies** were highlighted at the **High-Level Political Forum (HLPF) on Sustainable Development at the United Nations headquarters in New York.**
- The forum was held under the auspices of the U.N. Economic and Social Council (ECOSOC) with the theme, **'Reinforcing the 2030 agenda and eradicating poverty in times of multiple crises: The effective delivery of sustainable, resilient and innovative solutions.** A ministerial declaration adopted at the forum called for **renewed impetus to achieve the Sustainable Development Goals (SDGs).**
- The tribals in Rajasthan had adopted an **innovative approach guided by sustainable and resilient solutions across environmental, social, cultural, and economic systems.**
- **"Drawing from the principles of swaraj(sovereignty), tribals' lifestyle and cultural values have led to self-sufficiency, less dependence on external sources, and enhanced agricultural practices, which ensure food, nutrition and livelihood security for their families,"**
- The initiatives based on **seed sovereignty, soil sovereignty, food and nutrition sovereignty, water sovereignty and cultural sovereignty** had empowered tribal communities in the State to collectively overcome critical challenge.

**Sustainable Development Goals:**

- **Goal 1. End poverty in all its forms everywhere**
- **Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture**
- **Goal 3. Ensure healthy lives and promote well-being for all at all ages**
- **Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all**
- **Goal 5. Achieve gender equality and empower all women and girls**
- **Goal 6. Ensure availability and sustainable management of water and sanitation for all**
- **Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all**
- **Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all**
- **Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation**
- **Goal 10. Reduce inequality within and among countries**

- **Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable**
- **Goal 12. Ensure sustainable consumption and production patterns**
- **Goal 13. Take urgent action to combat climate change and its impacts\***
- **Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development**
- **Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss**
- **Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels**
- **Goal 17. Strengthen the means of implementation and revitalize the global partnership for sustainable development**

#### **Economic and Social Council (ECOSOC)**

- It coordinates the work of the 14 UN specialized agencies, ten functional commissions and five regional commissions, receives reports from nine UN funds and programmes (see reverse) and issues policy recommendations to the UN system and to Member States.
- Under the UN Charter, ECOSOC is responsible for promoting higher standards of living, full employment, and economic and social progress; identifying solutions to international economic, social and health problems; facilitating international cultural and educational cooperation; and encouraging universal respect for human rights and fundamental freedoms. ECOSOC's purview extends over 70 per cent of the human and financial resources of the entire UN system. The Council's 54 member Governments are elected by the General Assembly for three-year terms. In carrying out its mandate, ECOSOC consults with academics, business sector representatives and more than 2,500 registered non-governmental organizations.
- The Council holds a four-week substantive session each July, alternating between New York and Geneva. The session includes a high-level segment, at which national cabinet ministers and chiefs of international agencies and other high officials focus their attention on a selected theme of global significance. This year, the 29 June–1 July segment, chaired by ECOSOC President Munir Akram (Pakistan), will focus on progress made and challenges encountered in efforts to meet international development targets, including those in the Millennium Declaration

#### **UN puts 4th-century Gaza monastery on endangered site list**

**Subject: IR**

**Sec: Int Org**

**Context:**

The **Saint Hilarion complex**, one of the **oldest monasteries in the Middle East**, has been put on the **UNESCO list of World Heritage sites in danger** due to the war in **Gaza**.

**More on News:**

- The site which dates back to the fourth century, had been put on the **endangered list at the demand of Palestinian authorities and cited the "imminent threats"**.
- In December, the **UNESCO Committee for the Protection of Cultural Property in the Event of Armed Conflict** decided to grant "**provisional enhanced protection**" — the **highest level of immunity** established by the **1954 Hague Convention** -- to the site.

**List of World Heritage in Danger:**

- The **List of World Heritage in Danger** is compiled by then **United Nations Educational, Scientific and Cultural Organization (UNESCO)** through the **World Heritage Committee** according to **Article 11.4 of the World Heritage Convention**, which was established in **1972** to designate and **manage World Heritage Sites**.
- **Entries in the list are threatened World Heritage Sites for the conservation** of which major operations are required and for which "assistance has been requested".
- The list is intended to **increase international awareness of the threats** and to encourage counteractive measures.
- **Threats to a site can be either proven imminent threats or potential dangers that could have adverse effects on a site.**

#### **Ethiopia Receives IMF Relief After Easing Forex Curbs**

**Sub: IR**

**Sec: Int org**

**Background:**

- Ethiopia has recently eased foreign exchange curbs as part of a broad economic reform package.
- This move coincides with the International Monetary Fund's (IMF) approval of a loan to Ethiopia, which is seeking a multibillion-dollar bailout.



## Key Developments:

- **Currency Devaluation:**
  - The value of the Ethiopian currency, the **birr**, dropped by approximately **30%** following the **easing of forex curbs by the country's central bank**.
- **Economic Reforms:**
  - The **National Bank of Ethiopia (NBE)** announced a shift towards a **competitive market-based determination of the exchange rate**. This reform aims to correct a long-standing economic distortion in Ethiopia.
  - Under the new system, **banks can now buy and sell foreign currencies at freely negotiated rates, with limited central bank intervention**.
- **IMF Support:**
  - The IMF board approved a four-year loan program worth around **\$3.4 billion** to support Ethiopia's economic reforms, with **\$1 billion** immediately disbursed.
  - IMF Managing Director Kristalina Georgieva highlighted this as a landmark moment for Ethiopia, noting the country's commitment to transformative reforms.
- **Challenges:**
  - Ethiopia faces multiple economic challenges, including **\$28 billion** of external debt, **20% inflation**, and a shortage of foreign currency reserves.
  - The country has been battered by **armed conflicts, the COVID-19 pandemic, and climate shocks**.
- **Future Plans:**
  - The NBE hinted at **opening Ethiopia's securities market to foreign investors**, with further details to be announced soon.
  - Other measures include **allowing exporters and commercial banks to retain foreign exchange, increasing supply to the private sector**, and introducing non-bank foreign exchange bureaus.
- **Government Support:**
  - The government plans to temporarily subsidize essential imports like fuel, fertilizers, medicines, and edible oils.
  - **Financial support will be provided to low-income families** and public service salaries will be bolstered.

## Economic Impact and Outlook:

- **Mixed Reactions:**
  - Economist expressed concerns that the **forex reforms might exacerbate the economic crisis by increasing inflation** and noted that ensuring peace and security is crucial for attracting foreign investment.
  - In contrast, business analyst was optimistic, suggesting that the **financial cushion from international lenders could help stabilize the country's currency and narrow the gap between official and black-market rates**, potentially benefiting exports, including mining.

## Migrants face 'unimaginable horrors' crossing Africa says U.N.

**Sub: IR**

**Sec: Places in news**

**Context:**

- Refugees and migrants face extreme violence, abuse and exploitation on land routes crossing **Africa** to get to the **Mediterranean**, with far more believed to be dying there than at sea, a U.N.-backed report said.

**Details:**

- **Causes of migration:** The eruption of conflicts across the Sahel region and in Sudan, new and long-running violence in the Horn of Africa and the east of the continent, the devastating impact of climate change and disasters, as well as xenophobia and racism.
- **Tunisia** has overtaken **Libya** as the main departure point for migration towards Europe.
  - The water between **Tunisia** and the **Italian island Lampedusa**, is now named the **"Tunisian Corridor"**.
- **Major destinations: Italy** (Lampedusa, Catania, and Milan) and **Greece** (the islands of Lesbos, Chios, Samos, Leros, and Kos).

## Sri Lanka to lift the ban on foreign research vessels next year

**Sub : IR**

**Sec: Places in news**

**Context:**



- **Sri Lanka** will allow foreign research vessels to call at its **ports** starting **2025**.
- **Sri Lanka** will **not block vessels** from specific countries like **China**, stating the need for uniform rules.
- Earlier **Sri Lanka** blocked **two vessels of China- Shi Yan 6 and Yuan Wang 5**.

#### Details:

- In **January 2024**, **Sri Lanka** banned foreign research vessels after **India** and **the US** raised concerns over **Chinese vessels' visits**.
- **Sri Lankan ports** have become **focal points** for **strategic interests** among global powers.

#### Key Players and Investments:

- **China:** Announced a **\$400 million investment** in a logistics complex at **Colombo Port**.
- **India:** Strengthening maritime security cooperation with **Sri Lanka**, including a **Maritime Rescue Coordination Centre (MRCC)** and the revival of the **Colombo Security Conclave**.
- **U.S.:** **Development Finance Corporation (DFC)** investing **\$553 million** in the **West Container Terminal project** at **Colombo Port**.
- **Japan:** Providing **Sri Lanka** with a vessel equipped with **underwater sonar** to enhance oceanographic survey capabilities.
- **Technical Collaboration:** The **Sri Lanka Ports Authority (SLPA)** and the **Virginia Ports Authority (VPA)** signed a pact for the **exchange of expertise and technical collaboration**.

#### What is the Official Creditor Committee (OCC)?

- **OCC** is a group formed to represent the **collective interests of creditors** during the **debt restructuring or bankruptcy process of a debtor**, typically a corporation or sovereign entity.
- The **OCC** is often appointed in **formal insolvency proceedings**, such as those under the **jurisdiction of bankruptcy courts**, to ensure that the **creditors' interests are protected** and that the **restructuring plan is fair and equitable**.
- This term **OCC** is used more generally to describe any **ad-hoc committee** formed to represent official creditors during debt restructuring negotiations.
- It does not refer to a single, permanent organization but rather to various committees that might be formed for specific cases.

#### About:

- The **OCC** that has signed a deal with **Sri Lanka** recently refers to a specific **ad-hoc group of official bilateral creditors**, often formed to address the debt restructuring needs of a particular country.
- It was **formed in May 2023** with the **aim of simplifying Sri Lanka's debt negotiations** after the **country defaulted on its external debt**, in the wake of an unprecedented financial crash in 2022.
- **Members**
  - The **OCC** is a platform comprising **17 countries** including **India** and members of the **Paris Club** such as **Japan**, that have **extended loans to Sri Lanka**.

#### Headquarters

- While not a permanent entity with a fixed headquarters, meetings for this **OCC** would typically be held in **Paris**, especially if coordinated with the **Paris Club**, which has its secretariat there.

#### Role and Function

- The **OCC's primary role** is to **negotiate and coordinate the restructuring of Sri Lanka's external debt**, ensuring a fair and sustainable resolution for the country's debt crisis.

#### Colombo Security Conclave (CSC):

- The **CSC** was formed in **2011** as a **trilateral maritime security grouping** of **India, Sri Lanka and the Maldives**.
  - It welcomed **Mauritius** as a **fourth member** at the **fifth meeting of national security advisers**.
  - **Bangladesh** and **Seychelles** attended as **observers** and have been invited to join the group.
- **Envisaged Goal:** The fifth meeting of national security advisers of the **CSC** identified key areas of cooperation to enhance and strengthen regional security in the following **five pillars**:
  - Maritime Safety and Security
  - Countering Terrorism and Radicalization
  - Combating Trafficking and Transnational Organized Crime
  - Cyber Security, Protection of Critical Infrastructure and Technology
  - Humanitarian Assistance and Disaster Relief

## Resolve Tibet Act

**Sub: IR**

**Sec: Places in news**

**Why in news?**

US President Joe Biden signed the **Promoting a Resolution to Tibet-China Dispute Act**, also known as the **Resolve Tibet Act**, calling for a peaceful resolution of the dispute Tibet, which Beijing refers to as Xizang.

**Objectives of the Act**

- **Countering Misinformation:** Act seeks to counter Chinese government misinformation regarding Tibet's history, culture, and political status. It refutes Beijing's claim that Tibet has been part of China since ancient times.
- **Promotion of Dialogue:** Act encourages substantive dialogue between the Chinese government and Dalai Lama and elected Tibetan leaders without preconditions, aiming for a settlement, without preconditions.
- **Multilateral Efforts:** The Act calls for the U.S. to work with other governments in multilateral efforts to support Tibet and its people.
- **Human Rights Focus:** The act emphasizes the Tibetan people's right to self-determination and human rights.
- **Geographical Definition:** The Act clarifies that U.S. policy considers Tibet to include not just the Tibet Autonomous Region but also Tibetan areas within the Chinese provinces of Gansu, Qinghai, Sichuan, and Yunnan.

**Differences from previous legislation**

- Resolve Tibet Act is the third major U.S. legislation on Tibet after
  1. Tibetan Policy Act (TPA) of 2002
  2. Tibetan Policy and Support Act (TPSA) of 2020.
- Unlike its predecessors, the Resolve Tibet Act directly challenges China's historical claims over Tibet.

**India's position:**

India has refrained from making any strong statements regarding the Act.

**History of the dispute over Tibet**

- In 1950, the People's Liberation Army of China invaded Tibet.
- In 1951, Tibetan leaders were forced to sign a treaty dictated by China, known as the **Seventeen Point Agreement**. Tibet was formally incorporated into the People's Republic of China by the agreement.
- In 1959, a Tibetan uprising against Chinese rule led to the exile of the 14th Dalai Lama to India.

**About Dalai Lama**

**Dalai Lama belongs to the Gelugpa tradition of Tibetan Buddhism**

- There have been only 14 Dalai Lamas in the history of Tibetan Buddhism, and the first and second Dalai Lamas were given the title posthumously.
- The 14th and current Dalai Lama is Tenzin Gyatso.
- The Dalai Lamas are believed to be manifestations of Avalokiteshvara or Chenrezig, the Bodhisattva of Compassion and the patron saint of Tibet.

**Inflow of refugees into Chad deepens existing vulnerabilities: World Bank**

**Sub: IR**

**Sec: Places in news**

**Context:**

- A **World Bank report** highlights that the **influx of refugees into Chad**, especially from **Sudan**, has **exacerbated the nation's existing vulnerabilities**.

**Details:**

- As of December 11, 2023, **Chad** hosted **1.1 million refugees and asylum seekers**, primarily from **Sudan, Central African Republic, Cameroon** (mostly settled in two camps around **N'Djamena** and on the banks of the **Logone River**), and **Nigeria** (mainly distributed in the **Dar es Salaam camp** and **host villages in the Lake region**).
- Continued conflict in **2024** could bring an additional **600,000 Sudanese refugees**.

**Impact on Host Communities:**

- Border areas hosting refugees face **structural vulnerabilities**, including **poverty, gender inequality, and precarious livelihoods**.
- **80% of refugees and host community residents** struggle to meet basic needs, compared to **42% of Chad's general population**.

- Refugees often have **better access to education, healthcare, and essential services** through **humanitarian aid**, leading to **better living conditions** than **host populations**.

#### Food Insecurity and Resource Strain:

- **Chad** has experienced **severe food insecurity** for **four consecutive years**, affecting **2.1 million people in 2023**.
- **Food insecurity** and **environmental degradation** due to **refugee influx** have **intensified pressures on natural resources**, leading to **conflict between host populations and refugees**.

#### Chad:

- A **landlocked country** located at the crossroads of **North and Central Africa**.
- It is **bordered by Libya** to the **north**, **Sudan** to the **east**, the **Central African Republic** to the **south**, **Cameroon** to the **southwest**, **Nigeria** to the **southwest** (at **Lake Chad**), and **Niger** to the **west**.
- **Chad** has a population of **16 million**, of which **1.6 million** live in the **capital and largest city** of **N'Djamena**.
- **Chad** is the **fifth-largest country** in **Africa** and the **twentieth-largest nation** by area in the world.
- **Chad** has several regions: the **Sahara desert** in the **north**, an **arid zone** in the **centre** known as the **Sahel** and a more fertile **Sudanian Savanna zone** in the **south**.
- **Lake Chad**, after which the country is named, is the **second-largest wetland in Africa**.
- **Chad's official languages** are **Arabic and French**.

#### Israeli settlement threatens Palestinian UNESCO village

**Sub: IR**

**Sec: Places in news**

#### Context:

- **Israeli settlers** are **constructing a new illegal outpost** near **Palestinian olive groves** in **Battir**, a **UNESCO-protected zone**.

#### Heletz Settlement:

- The **Heletz settlement** was approved by the **Israeli government**.
- **Heletz** is **one of five settlements** approved deep in **Palestinian territory**.
- The **settlement aims to block Battir** and **increase local tensions**.

#### Palestine: Land of Olives and Vines – Cultural Landscape of Southern Jerusalem, Battir

- **Battir**, with its **ancient terraces** and **Roman-era irrigation system**, is a **UNESCO World Heritage site** since **2014**.

#### Location

- Situated a few kilometres southwest of Jerusalem
- Located in the Central Highlands between Nablus and Hebron

#### Landscape Features

- **Terraced Valleys:** Known as **widian**, these valleys are used for farming.
  - **Irrigated Terraces:** Used for market garden production.
  - **Dry Terraces:** Planted with grapevines and olive trees.

#### Agricultural Practices

- **Terrace Farming:** Developed to utilize the mountainous terrain.
- **Irrigation System:**
  - **Sources:** Network of irrigation channels fed by underground sources.
  - **Distribution:** Traditional system used to share water among Battir village families.

#### Why recent sighting of Peru's uncontacted Mashko Piro people is concerning

**Sub: IR**

**Sec: Places in news**

#### Context:

- **Survival International** released rare photos of the **Mashco Piro**, **one of the world's uncontacted tribes**.
- Over 50 tribespeople were seen near a river close to logging concessions, highlighting a potential humanitarian crisis.

#### Mashco Piro- Uncontacted Tribe:

- The **Mashco Piro**, numbering over **750**, are **nomadic hunter-gatherers** living in the **Amazon jungles** near **Peru's borders with Brazil and Bolivia**.

- **Peru's government** forbids contact with them to **prevent disease spread**, and most information about them comes from the **Yine people**.

#### Logging Threats:

- In **2002, Peru** created the **Madre de Dios Territorial Reserve** to protect the **Mashco Piro**, but much of their land remains outside the reserve.
- Logging companies, especially **Canales Tahuamanu**, have been granted large concessions and have aggressively defended their rights.
- The **Mashco Piro** have expressed their distress to the **Yine** about the **logging activities**.

#### Displacement and Survival:

- The **Mashco Piro** were previously displaced during **Peru's rubber boom** in the **1880s**, and moved further **upstream** on the **Manu river**, leading to their current isolation.
- Recent logging incursions have left them with nowhere to go, increasing sightings as they seek food and flee encroachers.
- Some have even been spotted in **Brazil**, fleeing the **logging activities** in **Peru**.

### Israeli occupation of Palestinian territory 'illegal': U.N. top court

#### Sub : IR

#### Sec: Places in news

#### Context:

- The **International Court of Justice (ICJ)** stated that **Israel's long-term occupation of Palestinian territory is illegal** and **should end immediately**.

#### Details:

- This advisory opinion, although **not binding**, comes amid the ongoing conflict between Israel and Hamas.

#### Israel's Settlement Policies:

- Israel's actions, including building new settlements and maintaining a separation wall, are considered as **annexing large parts of the occupied territory**.

#### U.N. and ICJ Proceedings:

- The **U.N. General Assembly** sought the ICJ's opinion on **Israel's violation of Palestinians' right to self-determination** and **discriminatory measures**.
- The ICJ's opinion on the **legal status of Israel's occupation** and its implications for the U.N. and other countries was also requested.
- Historically, the **ICJ** has provided **non-binding advisory opinions** on similar disputes, such as **Kosovo's independence** and **South Africa's occupation of Namibia**.
- In **2004**, the **ICJ** declared parts of **Israel's separation wall illegal** and called for its removal, a ruling Israel has not complied with.

#### About ICJ:

- **ICJ** was established in **1945** by the **United Nations charter** and started working in **April 1946**.
- It is the **principal judicial organ** of the **United Nations**, situated at the **Peace Palace** in **The Hague (Netherlands)**.
- Unlike the **six principal organs** of the **United Nations**, it is the **only one not located in New York (USA)**.
- It **settles legal disputes between States** and **gives advisory opinions** in accordance with international law, on legal questions referred to it by authorized United Nations organs and specialized agencies.
- It has **193 state parties** and **current President** is **Lebanese Judge Nawaf Salam**.

#### Structure of ICJ:

- The Court is composed of **15 judges**, who are **elected for terms of office of nine years** by the **United Nations General Assembly** and the **Security Council**. These organs vote simultaneously but separately.
- In order to ensure a measure of continuity, **one third of the Court is elected every three years** and **Judges are eligible for re-election**.
- **ICJ** is assisted by a **Registry**, its administrative organ. Its **official languages** are **English** and **French**.
- The **15 judges** of the Court are distributed in following regions:
  - Three from Africa.
  - Two from Latin America and Caribbean.
  - Three from Asia.
  - Five from Western Europe and other states.

- Two from Eastern Europe.
- Unlike other organs of international organizations, the Court is **not composed of representatives of governments**. Members of the Court are **independent judges** whose first task, before taking up their duties, is to make a solemn declaration in open court that they will exercise their powers impartially and conscientiously.
- In order to guarantee his or her independence, **no Member of the Court can be dismissed unless, in the unanimous opinion of the other Members, he/she no longer fulfils the required conditions**. This has in fact never happened.

### Israeli jets strike Houthi targets in Yemen ‘in response to attacks’

**Sub: IR**

**Sec: Places in news**

**Context:**

- Israel carried out air strikes on the Houthi-controlled Red Sea port of Hodeidah in Yemen.
- This action followed a drone launched by the Houthis hitting Tel Aviv.

Places in news	Description
• Hodeidah	• Red Sea port in Yemen, target of Israeli air strikes.
• Tel Aviv	• A city in Israel was hit by a Houthi drone.
• Eilat	• Israeli Red Sea port where air sirens were activated.
• Sanaa	• Capital of Yemen • Houthi-run government reported on strikes from here.
• Gulf of Aden	• Deepwater gulf of the Indian Ocean between Yemen to the north, the Arabian Sea to the east, Djibouti to the west, and the Guardafui Channel, Socotra and Somalia to the south. • Areas where the US and UK have conducted air strikes against the Houthis.

### Why Liberia might relocate its capital city Monrovia

**Sub: IR**

**Sec: Places in news**

**Context:**

- Senators in Liberia have proposed relocating the **capital city Monrovia** due to **recurring flash floods**.
- The proposal follows **torrential rains** that caused **flash floods**, affecting over 50,000 people.
- **Monrovia**, home to 1.5 million people and located on the **Atlantic coast**, was among the worst affected.

#### Causes of Recurrent Flooding in Monrovia:

- The **primary cause** is **rising sea levels**.
- In the **West Point slum** of Monrovia, **sea level rise** and **coastal erosion** displaced over 6,500 people and destroyed 800 houses between **2013** and **2018**.
- By **2030**, the **Greater Monrovia District** is expected to see a **sea level rise of 16 cm**, putting nearly 675,000 people and 9,500 hectares of land at risk.

#### Global Sea Level Rise:

- The **global sea level** has **risen** by about **8–9 inches** (21–24 cm) since 1880.
- The **rate of increase** has **accelerated** since **1993**, **more than doubling** from **0.07 inches (0.18 cm) per year** in 1993 to **0.17 inches (0.42 cm) per year** currently.
- **Drivers of Sea Level Rise:**
  - **Global warming** is the **main driver**, causing **glaciers** and **ice sheets** to melt and add water to the ocean.
  - **Thermal expansion**, where **warmer water expands in volume**, also contributes to **sea level rise**.

#### About Liberia:

- Officially known as the **Republic of Liberia**.
- Located on the **West African coast**, bordered by **Sierra Leone**, **Guinea**, **Ivory Coast**, and the **Atlantic Ocean**.
- **Official language:** English, with over 20 indigenous languages reflecting ethnic and cultural diversity.
- **Capital and largest city:** Monrovia.

### US Arctic Strategy 2024 to prevent Russia, China from exploiting icy northern region

**Sub: IR**

## Sec: Places in news

### Context:

- The new **Arctic Strategy 2024** of the **US** aims to **enhance surveillance, intelligence capabilities, and cooperation** with **allies** in the **Arctic** to **counter potential threats** from **Russia** and **China**.

### Details:

- **Eight nations** have a **presence in the Arctic**, including **Canada, Denmark, Finland, Iceland, Norway, Sweden, the United States** and **Russia**. The **strategy** calls for **deploying more ground-based sensors, space-based sensors, and long-range radar to monitor adversary activities**.
- It also focuses on **increasing unmanned aerial reconnaissance and communication capabilities**.
- The accession of **Sweden** and **Finland** to **NATO** strengthens the **alliance in the Arctic**, leaving **Russia** as the **only non-NATO Arctic nation**.
- The **strategy envisions increased joint exercises and cooperation to counter Russian and Chinese activities**.

### Russian and Chinese Activities in the Arctic:

- The **US** is concerned about **Russia's continued infrastructure investments** and **China's increased activities**, including **joint Russian-Chinese naval patrols** near **Alaska's Aleutian Islands**.
- **China** has declared itself a "**near-Arctic state**," seeking a **greater role in Arctic governance** and investing in research **expeditions, mining, and gas operations**.

### India's Arctic Policy:

- **India's Arctic Policy** aims to **enhance the country's cooperation with the resource-rich and rapidly transforming Arctic region**.
- The policy also seeks to **combat climate change** and **protect the environment** in the region, which is warming three times faster than the rest of the world.
- It was released by the **Ministry of Earth Sciences**.

### There are Six Central Pillars of the Arctic policy:

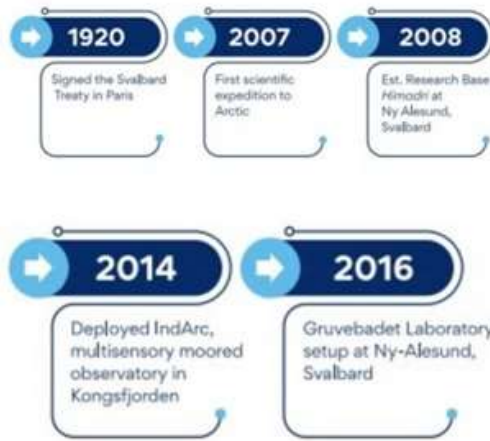
- Science and research.
- Environmental protection.
- Economic and human development.
- Transportation and connectivity.
- Governance and international cooperation.
- National capacity building.

### Objectives of Arctic Policy:

- To strengthen national capabilities and competencies in science and exploration, climate and environmental protection, and maritime and economic cooperation with the Arctic region.
- To strengthen institutional and human resource capacities within the government and academic, research and business institutions through inter-ministerial coordination in pursuit of India's interests in the Arctic.
- To enhance understanding of the impact of climate change in the Arctic region on India's climate, economic, and energy security.
- To promote better analysis, prediction, and coordinated policymaking on the implications of ice melting in the Arctic on India's economic, military and strategic interests related to global shipping routes, energy security, and exploitation of mineral wealth.
- To study the linkages between polar regions and the Himalayas and deepen the cooperation between India and the countries of the Arctic region under various Arctic forums, drawing expertise from scientific and traditional knowledge.
- To increase India's participation in the Arctic Council and improve understanding of the complex governance structures in the Arctic, relevant international laws, and geopolitics of the region.

### India and the Arctic Council





## Rival gangs sign truce in Haiti's largest shantytown

**Subject: IR**

**Sec: Places in news**

**Context:**

Port-Au-Prince, Haiti (AFP)— Two rival gang leaders signed a truce to **end armed conflict in Haiti's largest shantytown.**

**More on News:**

- Under the **agreement between leaders of the G9 and G-Pep groups**, roadblocks in the Cite Soleil (Sun City) shantytown of around 300,000 inhabitants were taken down.
- **Violence in Port-au-Prince** has skyrocketed in recent months, **sparking a serious humanitarian crisis.**

**Haiti's Gang war:**

- Since **2020, Haiti's capital Port-au-Prince** has been the site of an ongoing gang war between two major criminal groups and their allies: the Revolutionary Forces of the G9 Family and Allies (FRG9 or G9) and the G-Pep.
- The **Government of Haiti and Haitian security forces** have **struggled to maintain their control of Port-au-Prince amid this conflict**, with gangs reportedly controlling up to 90% of the city by 2023.
- In response to the escalating gang fighting, **an armed vigilante movement**, known as bwa kale, also emerged, with the purpose of fighting the gangs.
- On 2 October 2023, **United Nations Security Council Resolution 2699** was approved, authorizing a Kenya-led "multinational security support mission" to Haiti.
- In March 2024, **gang violence spread throughout Port-au-Prince with the goal of obtaining the resignation of acting prime minister Ariel Henry**, leading to the storming of two prisons and the release of thousands of prisoners. These attacks and subsequent attacks on various government institutions led **the Haitian government to declare a state of emergency and impose a curfew.**

**Formation of G9 Alliance:**

- Another **coalition of nine gangs** was announced to be founded in **Port-au-Prince in June 2020**, which became the "**G9 Alliance**" led by Chérizier.
- Since the **coalition was founded**, it has been responsible for multiple massacres against civilians and clashes with other rival gangs. **From 2020 to 2021, the G9 was responsible for a dozen massacres**, in which at least 200 people were killed.
- The G9 was believed to have had **close ties to the government of Moïse**, which was accused of **large-scale corruption.**
- The **coalition members frequently evaded prosecution after the massacres and the clashes.**
- The **G9 also began attacking neighborhoods in which civilians protested against the president and started clashes against rival gangs** with the support of the police.
- In response to the **growing dominance of G9**, a rival gang alliance, called "**G-Pep**", was founded in **July 2020.**
- It consisted of mainly those gangs in **Port-au-Prince's Cité Soleil** who were strongly **opposed to joining G9.**
- G-Pep was suspected of connection to **various opposition parties** and so **opposed G9 and its ties to Moïse.**

## Israel-Hezbollah conflict is heating up

**Subject: IR**

**Sec: Places in news**

### Context:

A deadly **rocket strike in the Israeli-occupied Golan Heights** has added to concerns that **Israel and the Iran-backed Lebanese group Hezbollah** could be sucked into a **full-scale war** – something they have both previously indicated they want to avoid but for which they have also said they are ready.

### Why are they fighting?

- **Hezbollah began trading fire with Israel, a day after the Palestinian militant group Hamas attacked communities in southern Israel and sparked the Gaza war.**
- **Hezbollah, a Hamas ally, says its attacks aim to support Palestinians who are under Israeli bombardment in Gaza.**
- **The Gaza war has drawn in Iran-backed militants across the region. Hezbollah is widely deemed the most powerful member of the Iran-backed network, known as the Axis of Resistance.**
- **Hezbollah's ideology is largely defined by conflict with Israel. It was founded by Iran's Revolutionary Guards in 1982 to fight Israeli forces that had invaded Lebanon that year, and waged years of guerrilla war that led Israel to withdraw from south Lebanon in 2000.**
- **Hezbollah deems Israel an illegitimate state established on occupied Palestinian lands and wants to see it gone.**

### Impact:

- **Tens of thousands of people have been forced to flee their homes on both sides of the border. Israeli airstrikes have pounded areas where Hezbollah operates in southern Lebanon and struck the Bekaa Valley near the Syrian border.**
- **Israel has also occasionally hit elsewhere, notably killing a senior Hamas commander in**

### Is escalation avoidable?

- **A ceasefire there could help bring about a rapid de-escalation of tensions in southern Lebanon.**
- **Israel has also said it would prefer a diplomatic settlement that would restore security in the north.**

### Reasons for the Iran-Israel Conflict:

- **Historical Context:** Iran and Israel have had a tumultuous relationship since the **Iranian Revolution of 1979**, which transformed Iran from a close ally of Israel under the rule of the Shah to an Islamic Republic openly hostile towards Israel.
- **Religious and Ideological Differences:** Iran is an Islamic republic governed by Shia Islam, while Israel is a predominantly Jewish state.
  - **The religious and ideological differences between the two countries have contributed to mutual suspicion and animosity.**
- **Israeli-Palestinian Conflict:** Iran has been a staunch supporter of Palestinian causes, including backing militant groups like **Hamas and Hezbollah**, which are considered **terrorist organisations by Israel**.
  - **Iran's support for these groups and its calls for the destruction of Israel have heightened tensions.**
- **Geopolitical Rivalry:** **Iran and Israel are regional rivals vying for influence in the Middle East.** They have conflicting interests in various regional conflicts, including the **civil wars in Syria and Yemen**.
  - **Where Iran supports the Assad regime and Houthi rebels, respectively, while Israel opposes Iranian influence in these countries.**

## The peace deal in Colombia has affected its cocaine industry

**Subject: IR**

**Sec: Security issues**

### Context:

- **Domestic and foreign shifts in the global drug industry have devastated many poor Colombians whose livelihoods are tied to cocaine.**

### More about News:

- **For decades, one industry has sustained the small, remote Colombian village of Cano Cabra: cocaine.**
- **Those who live in this community in the central part of the country rise early nearly every morning to pick coca leaf, scraping brittle branches, sometimes until their hands bleed. Later, they mix the leaves with gasoline and other chemicals to make chalky white bricks of coca paste.**
- **The drug traffickers who buy the coca paste and turn it into cocaine stopped showing up. Suddenly, people who were already poor had no income.**
- **Coca is the only source of income.**

- **Colombia, the global nexus of the cocaine industry**, where **Pablo Escobar** became the world's best-known criminal, and which still produces more of the drug than any other nation, is facing **tectonic shifts** as a result of **domestic and global forces** that are **reshaping the drug industry**.

#### **FARC Peace Deal:**

- It refers to the **agreement** reached between the **Colombian government and the Revolutionary Armed Forces of Colombia (FARC)** to end decades of conflict. It is a significant milestone in Colombia's efforts to achieve lasting peace and stability.
- FARC is a **Marxist-Leninist guerrilla** group founded in **1964** that waged an **armed struggle** against the **Colombian government** for over five decades.
- The **conflict resulted in over 220,000 deaths** and the displacement of millions of people, making it one of the longest-running conflicts in Latin America.
- A **peace deal** was signed on **November 24, 2016**, and subsequently **ratified** by the **Colombian Congress**.

#### **How does the FARC peace deal impact Columbia?**

- The upending of the cocaine industry is, in part, an unintended consequence of a **landmark peace deal eight years ago with the country's largest armed group**, the **Revolutionary Armed Forces of Colombia, or FARC**, that ended one phase of a conflict that has lasted decades.
- The leftist group financed its war largely through cocaine and relied on thousands of farmers to provide the **bright green coca plant — the drug's main ingredient**.
- But once the **FARC exited the cocaine industry**, it was replaced by **smaller criminal groups pursuing a new economic model**.
- **Limiting their operations to border regions** where it is **easier to move drugs out of the country**.

#### **Implications on India:**

- **Changes in the Colombian cocaine industry** may **alter global drug trafficking routes**.
- India, as part of the **global drug trade network**, could see **changes in the routes** used to smuggle cocaine into the country.
- **Increased cocaine production** globally could lead to a **higher availability** of the drug in **India**.
- This could result in an **increase in drug trafficking activities** within the country **visible in increased seizures** in major cities.
- Higher availability of cocaine could lead to an **increase in drug abuse cases** in India.

#### **Russia – China joint naval exercise**

**Sub : IR**

**Sec: Msc**

Two Russian warships have arrived in the southern Chinese port city of Zhanjiang to take part in joint naval exercises.

- China and Russia have greatly reinforced ties since the start of the Russian offensive in Ukraine that began in February 2022.
- Their common goal is also to reduce the role of the United States and the West on the international stage.
- The two countries hold joint military exercises regularly, but their level of interoperability is greatly inferior to that of the Western military alliance NATO.

#### **Zhanjiang Port**

Zhanjiang is a natural deepwater harbour in Southeast China, situated in Guangzhou Bay

### **Polity**

#### **Amendment to Citizenship Amendment Act (CAA) 2019**

**Sub : Polity**

**Sec : Constitution**

**Context:** The Union Home Ministry is considering amendments to simplify the provisions of the Citizenship Amendment Act (CAA), particularly focusing on Schedule 1A, which currently requires applicants to submit documents proving their citizenship from Bangladesh, Pakistan, or Afghanistan.

#### **Current Issues and Proposed Amendments**

- **Document Requirements:** Schedule 1A of the CAA mandates that applicants must furnish documents issued by any government agency in Bangladesh, Pakistan, or Afghanistan to prove their eligibility for citizenship under Section 6B of the CAA.

- **Concerns Raised:** Many applicants, especially in West Bengal, who migrated from Bangladesh lack these documents. This has created challenges in the application process.
- **Amendment Discussions:** The government is considering amendments to Schedule 1A to facilitate easier application procedures.
  - Officials have emphasised that the CAA is meant to be facilitative, allowing flexibility in document submission.
- **Implementation Flexibility:** Authorities handling applications have been advised to process applications even if the required documents are not immediately available.
  - Applicants can submit documents later, with officials recording them as 'pending for processing'.

#### Statements and Perspectives

- **Facilitative Law:** The CAA is described as a facilitative law aimed at providing citizenship to persecuted minorities. It emphasises understanding the spirit of the law while processing applications.
- **Role of Religious Institutions:** It suggested that applicants could submit eligibility certificates issued by religious institutions certifying their faith in the absence of Schedule 1A documents.
- **Electoral Impact and Public Perception:** The rollout of CAA Rules in March 2023 did not yield expected electoral benefits for BJP in West Bengal.
  - There was confusion surrounding the application process, which was capitalised upon by political opponents.
- **Challenges and Misconceptions:** There is a misconception that possession of voter ID cards or Aadhaar automatically grants citizenship.
  - Many migrants facing religious persecution lack proper documentation, leading to challenges in employment and other bureaucratic processes.
- **Simplification and Security Concerns:** While there is a call for simplifying rules, concerns about potential misuse by individuals from neighbouring countries changing their identities remain. Schedule 1A was initially introduced to prevent such misuse.

#### Significance

- The ongoing discussions and proposed amendments to Schedule 1A of the CAA reflect efforts to streamline the citizenship application process for migrants from Bangladesh, Pakistan, and Afghanistan.
- The intent is to balance facilitating citizenship for persecuted minorities with ensuring security and verification measures are in place.
- These developments are significant in addressing practical challenges faced by applicants and responding to public and political feedback, particularly in states like West Bengal.

#### About Citizenship Amendment Act 2019

The Citizenship Amendment Act (CAA) of 2019 introduced significant changes to India's citizenship laws, specifically aimed at providing a path to Indian citizenship for certain religious minorities from neighbouring countries.

#### Key Features of the Citizenship Amendment Act, 2019

- **Eligibility Criteria**
  - The CAA amended the Citizenship Act of 1955 to grant Indian citizenship to illegal migrants who are **Hindus, Sikhs, Buddhists, Jains, Parsis, and Christians** from **Afghanistan, Bangladesh, and Pakistan**.
  - These migrants should have entered India on or before December 31, 2014, to be eligible for citizenship.
- **Definition of Illegal Migrants**
  - An illegal migrant is defined as someone who enters India without valid travel documents or stays beyond the permitted time under applicable law. Such individuals face potential prosecution, deportation, or imprisonment.
- **Exemption for Muslims**
  - The CAA explicitly excludes Muslims from its provisions, focusing exclusively on persecuted minorities from the specified countries.
- **Residency Requirement**
  - The residency requirement for eligible communities seeking Indian citizenship through naturalisation was reduced from 11 years to 6 years.
- **Legal Protections**
  - Members of the eligible communities are exempted from prosecution under the Foreigners Act, 1946, and the Passport Act, 1920, further facilitating their integration into Indian society.
- **Exceptions**
  - Certain regions are exempt from the amendments, including tribal areas under the Sixth Schedule in Assam, Meghalaya, Mizoram, and Tripura, as well as areas regulated by the Inner Line Permit (ILP) system in states like Arunachal Pradesh, Nagaland, and Mizoram.

- **Consequences of Acquiring Citizenship**

- Individuals granted citizenship under the CAA are deemed to be citizens of India from the date of their entry into the country.
- Legal proceedings related to their illegal migration or citizenship status are closed upon acquiring citizenship.

- **OCI cancellation Grounds**

- The amendment also allows cancellation of Overseas Citizen of India (OCI) registrations if the OCI holder violates any law notified by the Indian government.

## Government to observe June 25 as 'Samvidhaan Hatya Diwas' to mark Emergency

### Sub: Polity

#### Sec: Constitution

#### Context:

PM Modi says it is a reminder of what happened when “**Constitution was trampled over**”; Congress slams government’s decision and calls it “**another headline grabbing exercise**”

#### More About News:

- The Union government has decided to observe **June 25** — the day that the Emergency was imposed in 1975 — as ‘**Samvidhaan Hatya Diwas**’,
- “This day will **commemorate the massive contributions** of all those who endured the **inhuman pains of the 1975 Emergency**.”
- “The observance of ‘Samvidhaan Hatya Diwas’ will help keep the **eternal flame of individual freedom** and the **defense** of our democracy alive in every Indian, thus **preventing dictatorial** forces like the Congress from repeating those horrors”.
- “It is also a day to pay **homage** to each and every person who suffered due to the **excesses of the Emergency**, a Congress-unleashed **dark phase of Indian history**”.

#### Samavidhaan Hatya Diwas:

- **Constitution Assassination Day.**
- After the Emergency was declared on **June 25, 1975**, there was “**gross abuse of power... and people of India** were subjected to **excesses and atrocities**”. The people of India have **abiding faith** in the **Constitution and the power of its resilient democracy**.
- **(1975-1977):** The third and **most controversial** national emergency was declared in 1975, primarily due to “**internal disturbance**” amidst internal political unrest. This period witnessed a **significant suspension of civil liberties**.

#### Impacts Imposed during 1975 Emergency:

- **Constitution (39th Amendment) Act, 1975** was enacted in response to the Allahabad High Court's ruling declaring PM Indira Gandhi's election void.
  - The Act placed **disputes involving the president, Vice President, prime minister, and Speaker beyond the judiciary's scope** and included certain Central Acts in the Ninth Schedule

## Karnataka Cabinet clears Bill mandating 50% reservation for locals in management jobs and 75% in non-management positions

### Sub: Polity

#### Sec: Constitution

#### Context:

- **The Karnataka State Employment of Local Candidates in the Industries, Factories and Other Establishments Bill, 2024.**
- The **Karnataka Cabinet** has approved the Bill **requiring industries, factories, and other establishments to appoint local candidates in 50% of management positions and 75% in non-management positions.**

#### Eligible Candidates:

- A **local candidate** is defined as someone **born in Karnataka, domiciled in the state for 15 years, capable of speaking, reading, and writing Kannada legibly**, and has passed a **required test conducted by a nodal agency**.
- Candidates **must have a secondary school certificate with Kannada as a language or pass a Kannada proficiency test** as specified by the nodal agency.
- If qualified local candidates are not available, industries and establishments must collaborate with the government to train local candidates within three years.

- Industries may apply for relaxation from the provisions if a sufficient number of local candidates are not available, but the percentage of local candidates should not fall below **25%** in **management positions** and **50%** in **non-management categories**.
- Non-compliance may attract penalties ranging from **₹10,000** to **₹25,000**.

#### Background and Demand:

- The Bill comes amid demands for **100% job reservation for Kannadigas**.
- Earlier in July, Kannada organizations held rallies demanding the immediate implementation of the **Sarojini Mahishi report**, which recommended quotas for locals in government and private sector jobs.
- The **Sarojini Mahishi Committee**, led by former Union Minister **Sarojini Mahishi**, submitted a report in **1984** with **58 recommendations**, including **100% reservation for locals in group C and D jobs in Central government departments and public sector undertakings (PSUs) operating in Karnataka**.

#### States cannot tinker with the Scheduled Castes List, says SC

##### Sub: Polity

##### Sec: Constitution

##### Context:

- The Supreme Court has held that **States cannot tinker with the Scheduled Castes List** notified under **Article 341** of the Constitution.

##### More on the news?

- In a recent judgment the Supreme court held that **inclusions and exclusions in the Scheduled Castes List are only possible through law made by the Parliament** and **neither the President nor the Centre** can make changes.
- This decision came as the Supreme Court quashed a **2015 Bihar government notification** that sought to categorize the **Tanti-Tantwa community as Scheduled Caste (SC)**.
- The court observed that the **Bihar government had not followed the due process and consultation** with the **Registrar General of India**, who had **not supported the proposal to include Tanti-Tantwa in the SC list**.

#### What is the Procedure for inclusions and exclusions in the Scheduled Castes List?

- **Initiation of process:**
  - A **state government** proposes the **inclusion or exclusion of a community from the SC list**, which is scrutinized by the Ministry of Social Justice and Empowerment.
- **Expert Consultation:**
  - The National Commission for Scheduled Castes (NCSC) along with the **Registrar General of India** provides **expert recommendations on the proposal**.
- **Parliamentary Process:**
  - A **Constitutional Amendment Bill is introduced in Parliament**, detailing the proposed changes to the SC list.
  - The bill needs to be **passed by a special majority in parliament**.
- **Presidential Assent:**
  - After the bill is passed by both houses of parliament it is **referred to the President**.
  - If the **President gives his assent**, the amendments to the **SC list are officially enacted**.

#### Constitutional provisions related to inclusions and exclusions in the Scheduled Castes List.

- **Article 341(1):**President, after consultation with the State Governor, may by public notification **specify the castes, races or tribes** or parts of or groups within **castes, races or tribes** which shall for the purposes of this Constitution be **deemed to be Scheduled Castes** in relation to a **State or Union Territory**.
- **Article 341(2):**Parliament may by law **include in or exclude from the list of Scheduled Castes** specified in a **notification issued** under clause (1) any **caste, race or tribe or part of or group** within any caste, race or tribe, but save as aforesaid a notification issued under the said **clause shall not be varied by any subsequent notification**.

#### Article 361 provides immunity to the President and Governors from legal proceedings during their term

##### Subject: Polity

##### Sec: Constitution

##### Context:

The Supreme Court of India agreed to delve into the provisions of Article 361 of the Indian Constitution, which provides “blanket immunity” to governors from any form of criminal prosecution.

##### More about News:



- The bench, led by **Chief Justice DY Chandrachud**, issued a notice to the **West Bengal government** concerning a plea filed by a contractual woman employee.
- The apex court asked the woman employee of West Bengal '**Raj Bhavan**' to make the Centre a party to her plea as well. The woman alleged that she was molested by the state Governor **CV Ananda Bose** and is seeking judicial scrutiny of **Article 361**.
- **Article 361** is an exception to **Article 14 (right to equality)** of the Constitution and provides that the president or the governor is not answerable to any court for the exercise of the powers and duties of his office.

#### Article 361:

- **Article 361** of the Constitution that deals with immunity to the President and the Governors. It states that they shall not be answerable:
  - to any court for the exercise and performance of the powers and duties of his office; or
  - for any act done or purporting to be done by him in the exercise and performance of those powers and duties.
- **Article 361** grants the Governor of a State immunity from legal liability for their official acts and personal acts during their term of office.
- Governor cannot be held accountable to any court for their official duties, and no criminal proceedings can be initiated against them.
- Civil proceedings can be brought against them for their personal acts after two months' notice.
- The Governor also cannot be arrested or imprisoned while in office.
- Additionally, if Governor commits any criminal offense during their term of office, they can be prosecuted once their term ends.
- This ensures that they are not above the law and can be held responsible for any unlawful actions.

#### Primary role of governors:

- **Primary responsibility** of a governor in India is to uphold, safeguard and enforce the Constitution and the laws of the land. In **Articles 153 and 154** of the Constitution of India, governors are responsible for ensuring the smooth functioning of the state government while upholding the constitutional framework.

#### Historical context and precedents:

- In the landmark case of **Rameshwar Prasad v. Union of India**, the Court elaborated on the immunities granted to the governor, affirming that even allegations of personal malafides do not diminish this immunity. The ruling established that the governor is fully shielded under **Article 361** not only from criminal complaints but also from actions related to the discretionary powers exercised in their constitutional role.

#### Supreme Court Verdict on the Rameshwar Prasad Case:

- Constitution Bench led by the then **Chief Justice of India Y K Sabharwal** delivered a decisive verdict on **October 7, 2005**.
- The Supreme Court ruled that the Governor should avoid getting involved in controversies like **disqualifying members of the Legislative Assembly**. Therefore, the Constitution includes provisions such as **Article 192(2)** and **Article 103(2)**, which require the Governor to seek the opinion of the Election Commission and act
- The court criticized the Governor's actions as insincere and claimed that the underlying motive was to prevent a political party from attempting to form the Government.

#### State cannot claim 'serious charges' to oppose bail, says Supreme Court

**Subject: Polity**

**Sec: Constitution**

**Context:**

A Bench of Justices J.B. Pardiwala and Ujjal Bhuyan ordered **Sheikh Javed Iqbal**, a man awaiting trial under the **Unlawful Activities Prevention Act (UAPA)** for nine years, to be released on bail, in yet another back-to-back decision which upheld the right of an individual's personal liberty over the state's claim that bail should not be made easy when serious crimes were involved.

#### More about News:

- **Bail cannot be denied** only on the ground that the charges are very serious though there is no end in sight for the trial to conclude.
- The man was arrested near the **Indo-Nepal border in February 2015** allegedly with fake Indian currency notes amounting to over **₹23 lakh**. He has been behind bars since then. The man appealed to the **Supreme Court** after the **Allahabad High Court** denied him bail.
- **Article 21** of the Constitution applies irrespective of the nature of the crime.

- While imposing bail conditions, the constitutional rights of an accused ordered to be released on bail can be curtailed only to the **minimum extent required**.

#### **Unlawful Activities (Prevention) Act:**

- UAPA was passed in **1967**.
- It **aims at effective prevention of unlawful activities associations in India**.
- **Unlawful activity** refers to any action taken by an individual or association intended to disrupt the **territorial integrity and sovereignty of India**.
- The Act assigns absolute power to the central government, by way of which if the **Centre deems an activity as unlawful** then it may, **by way of an Official Gazette, declare it so**.
- It has **death penalty and life imprisonment** as highest punishments.
- Under UAPA, **both Indian and foreign nationals** can be charged. It will be applicable to the **offenders in the same manner**, even if crime is committed on a **foreign land, outside India**.
- Under the UAPA, the investigating agency can **file a charge sheet in maximum 180 days after the arrests** and the duration can be extended further after intimating the court.
- The **2004 amendment**, added “**terrorist act**” to the **list of offences to ban organisations for terrorist activities, under which 34 outfits were banned**.
- Till 2004, “**unlawful**” activities referred to **actions related to secession and cession of territory**.
- **Parliament cleared the Unlawful Activities (Prevention) Amendment Bill, 2019** to designate individuals as **terrorist** on certain grounds provided in the Act.
- The **Act empowers the Director General of National Investigation Agency (NIA) to grant approval of seizure or attachment of property when the case is investigated by the said agency**.
- The Act empowers the officers of the NIA, of the rank of **Inspector or above**, to investigate cases of terrorism in addition to those conducted by the **DSP or ACP or above rank officer in the state**.

#### **Article 21:**

- “**Protection of Life and Personal Liberty: No person shall be deprived of his life or personal liberty except according to procedure established by law.**”
- This fundamental right is **available to every person, citizens and foreigners**
- **Article 21 provides two rights:**
  - **Right to life**
  - **Right to personal liberty**
- The **Supreme Court of India** has described this right as the ‘**heart of fundamental rights**’.

#### **Centre defends fact-check unit, says right to correct information important**

**Sub: Polity**

**Sec: Constitution**

**Context:**

- Defending the formation of a **fact-checking unit (FCU)**, the Union government said in the Bombay High Court on July 24 that the right to know factually correct information and the right to not be misled were equally important as the right to freedom of speech and expression under **Article 19(1)(a)**.

#### **What is a Fact Check Unit?**

- The provisions for the Fact Check Unit was introduced through Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Amendment Rules, 2023.
- Rules required significant social media intermediaries (SSMIs) (such as Twitter, Facebook, etc.) and Online Gaming Intermediary to inform their users to not 'host, display, upload, modify, publish, transmit, store any information which is 'identified as fake or false or misleading by a fact check unit of the Central Government' in respect of any business of the Central Government.
- The MeitY is empowered to notify the fact check unit of the central government to identify fake, false, or misleading information about any central government business.
- In cases where information has been flagged as false or misleading, intermediaries are expected to take down the content.
- This implies that the union government now possesses the authority to remove any information it considers false.

#### **Why is FCU challenged in the Bombay high court?**

- The proposed introduction of the FCU has raised concerns among internet freedom activists and therefore challenged in the Bombay high court.
- Petitioner argued that the amendment enables the government to be the “**prosecutor, the judge, and in that loose sense, the executioner**” of what constitutes the ‘truth’ online, thereby violating the cardinal **principles of natural justice**.
- They also pointed out that the “overbroad and vague” nature of the rules created a “**chilling effect**” on the freedom of speech and expression guaranteed under **Article 19(1)(a) of the Constitution**.

#### What is the Government's stand?

- Government argues that the right to be informed correctly is necessarily inherent under **Article 21**.
- **Solicitor-General Tushar Mehta, for the Union government, said the FCU would prevent people from false information.**
- Since many private companies and individuals also maintain fact-checking units and the government is similarly justified in providing accurate information to the public.
- Government has told the court that the Right to know factually correct information and the Right to not be misled were equally important as the Right to freedom of speech and expression under **Article 19(1)(a)**.

### States have unlimited right to tax mineral-rich lands: Supreme Court

#### Sub: Polity

#### Sec: Constitution

#### Context:

- A significant judgment delivered in a **8:1 ratio by a nine-judge Constitution Bench** on July 25 held that the power of **State Legislatures to tax mining lands and quarries** is not limited by the Parliament’s **Mines and Minerals (Development and Regulation) Act of 1957**.

#### What is the Supreme Court judgment?

- In 1989 **Supreme court in India Cement Ltd. vs Tamil Nadu Government** case ruled that **states were permitted only to collect royalties** and not impose additional taxes.
- The court considered **royalties as taxes and imposing any cess on them is beyond state jurisdiction**.
- The Constitution Bench headed by Chief Justice of India (CJI) D.Y. Chandrachud has **overturned the 1989 judgment which ruled that royalties were not a tax**.
- The majority judgment said the **Parliament, through the MMDR Act, cannot limit the power of the State to legislate on the taxation of mines and quarries within their jurisdiction**.
- The bench ruled that **Parliament does not possess the power to tax mineral rights which are under Entry 50 of the List II of the Constitution**, which governs state powers and is limited to imposing restrictions and **not taxes**.
- **State Legislatures** derive their power to tax mines and quarries under **Article 246 read with Entry 49 (tax on lands and buildings) in the State List of the Seventh Schedule of the Constitution**.
- **CJI also held that the Parliament does not have the legislative competence to tax mineral rights, with Entry 54 of the Union List** (Regulation of mines and minerals development declared by parliamentary law to be expedient in the public interest) being only a general entry.
- **Power to tax mineral rights is enumerated in List II**.

#### What is royalty?

- **Royalty is a contractual consideration** paid by the mining lessee to the lessor **for enjoyment of mineral rights**.
- It originates from an **agreement between parties**.
- **Royalties are the fees paid to the owner of a product in exchange for the right to use that product**.
- The majority verdict further clarified that **royalty paid by those who lease mines to the government is not tax**.

### Panel will look into issues stalling Bill, NE tribal councils told

#### Sub: Polity

#### Sec: Constitution

#### Context:

Chiefs of 10 Sixth Schedule tribal autonomous councils meet Home Minister Amit Shah to push for the Constitution (125th Amendment) Bill, pending in Rajya Sabha since 2019.

#### 125th Constitutional Amendment Bill:

- The Constitution (One Hundred and Twenty-Fifth Amendment) Bill, 2019 was introduced in Rajya Sabha by the Minister of Home Affairs, Mr. Rajnath Singh on February 6, 2019.

- The Bill amends provisions related to the **Finance Commission and the Sixth Schedule of the Constitution**.
- The **Sixth Schedule** relates to the administration of tribal areas in the **states of Assam, Meghalaya, Tripura and Mizoram**.

#### Features of the bill:

- The Bill provides for **Village and Municipal Councils** in addition to the **District and Regional Councils**. **Village Councils will be established for villages** or groups of villages in rural areas, and **Municipal Councils will be established in urban** areas of each district.
- **Bill states that the Governor may make rules for devolution of powers and responsibilities to the Village and Municipal Councils.**
  - The District Councils may make laws on various issues, including:
    - **(i) preparation of plans for economic development.**
    - **(ii) implementation of land reforms.**
    - **(iii) urban and town planning,**
    - **(iv) regulation of land-use, among other functions.**
- The Bill provides the **appointment of a Finance Commission for these states**, to review the **financial position of District, Village, and Municipal Councils**.
- The Bill states that **all elections to the District Councils, Regional Councils, Village Councils, and Municipal Councils will be conducted by the State Election Commission** appointed by the Governor, for these four states.
- The Sixth Schedule provides that the **Governor may make rules for the constitution of District and Regional Councils**, including qualifications for being elected as members of these councils.
- The Bill adds that the **Governor may make rules for the disqualification** of such members on the grounds of defection.

#### What is 6th Schedule?

- The **Sixth Schedule of the Indian Constitution** includes provisions for the administration of tribal areas in the states of **Assam, Meghalaya, Tripura and Mizoram** in northeast India.
- It establishes **autonomous councils that have legislative, judicial, executive and financial powers** to independently govern these areas.
- There are a total of **10 autonomous councils under the Sixth Schedule**, including **three each in Assam, Meghalaya and Mizoram** and **one in Tripura**.
- An **Autonomous District Council (ADC)** is established for **each autonomous district while Regional Councils (RC)** are established where there are significant populations of other tribes, aside from the main tribe.

#### MEA tells States not to 'intrude' into foreign affairs after Kerala appoints senior officer for 'external cooperation'

**Subject: Polity**

**Sec: Constitution**

**Context:**

Days after the Kerala government appointed senior IAS officer K. Vasuki as an officer in charge of 'external cooperation', the **Ministry of External Affairs (MEA)** reminded the **State governments that they should not "intrude" into domains that are beyond the "Constitutional jurisdiction" of the States.**

**More on News:**

- The **Constitution of India under the 7th Schedule list 1 - Union list, item 10**, clearly specifies that **foreign affairs and all matters which bring the Union into relation with any foreign country, are the sole prerogative of the Union Government.**
- The States of the India are important **stakeholders in foreign and security affairs** but the **ultimate foreign policy formulation takes place at the central level.**
- It is **not a Concurrent subject and definitely not a State subject.** Our position is that **State governments should not intrude into matters that are beyond their Constitutional jurisdiction.**

**7th Schedule:**

- The **7th schedule of Indian constitution** specifies the **allocation of powers and functions between the Union and states.**
- **Article 246, which is under the 7th schedule of Indian constitution, is one such article.**
- **Article 246 divides the subject matter of laws made by the Parliament and the State Legislature under three lists.** They are:

- **List I – Union List**
- **List II – State List**
- **List III – Concurrent List**

- To amend the **7th schedule of Indian constitution**, a **special majority of the Parliament and ratification of half of the State Legislatures by a simple majority is required.**

#### **Union List of the 7th schedule of Indian Constitution - List 1**

- Subjects that are of **national importance** and are handled by the **central government.**
- The **Union government has exclusive power to legislate on these subjects.**
- This means that only the **Union government can make laws** on these subjects.
- The **state governments cannot make laws on these subjects.**

#### **Constitution of India under the 7th Schedule list 1 - Union list, item 10**

- **Foreign affairs; all matters which bring the Union into relation with any foreign country.**

#### **SC to examine acquitted man's 'right to be forgotten'**

**Sub: Polity**

**Sec: Constitution**

**Context:** Last week, the Supreme Court agreed to hear a case whose outcome will likely shape the contours of the “right to be forgotten”, known in European information privacy regulation as the “right to erasure”, in India. The top court now has to decide whether the right to be forgotten is a fundamental right and, if so, how it relates to other fundamental rights guaranteed by the Constitution of India.

#### **What is the matter?**

- A three-judge Bench headed by Chief Justice of India (CJI) D Y Chandrachud will hear a challenge against a Madras High Court ruling that on February 27 directed legal search portal Indian Kanoon to take down a judgment in a 2014 rape and cheating case. The acquitted man had moved the Madras HC in 2021, saying that he had been denied the citizenship of Australia because his name appears in the judgment that is publicly available on the legal portal.

#### **What is the right to be forgotten?**

- The right to be forgotten can be loosely described as the **right to remove one's digital footprint (from Internet searches, etc.) where it violates the right to privacy.**
- In May 2014, the **Luxembourg-based Court of Justice of the European Union (CJEU)**, the highest court in matters concerning the application and interpretation of EU law, affirmed that there exists a right to be forgotten.
- The right to be forgotten derives from the case **Google Spain SL, Google Inc v Agencia Española de Protección de Datos, Mario Costeja González (2014)**. For the first time, the right to be forgotten is codified and to be found in the General Data Protection Regulation (GDPR) in addition to the right to erasure.
- **Citing Articles 7 (respect for private and family life) and 8 (protection of personal data) of the EU Charter on Fundamental Rights**, the CJEU ruled that search engines must cater to individual requests to remove data that “appear to be inadequate, irrelevant or no longer relevant or excessive in the light of the time that had elapsed”.
- Informational self-determination — an individual's right to control and limit her personal information — is now widely recognised in EU law. **Article 17 of the EU's General Data Protection Regulation (GDPR)** describes the right to erasure. From victims of so-called “revenge porn” to individuals whose personal cases are on the Internet, the right to be forgotten is a crucial remedy.

#### **How is the right interpreted in India?**

- In India, there is no statutory framework that prescribes the right to be forgotten. However, not all constitutional rights need to be written in black and white. Until the 2017 judgment in Justice K S **Puttaswamy v Union of India** — in which the apex court explicitly recognised the right to privacy as a fundamental right, placing it as a facet of the right to life, right to equality, and the right to freedom of speech and expression — there were also questions on the right to privacy.
- A concurring opinion in the Puttaswamy ruling by Justice S K Kaul mentions the right to be forgotten. Justice Kaul said that this right “does not mean that all aspects of earlier existence are to be obliterated... It would only mean that an individual who is no longer desirous of his personal data to be processed or stored, should be able to remove it from the system where the personal data/ information is no longer necessary, relevant, or is incorrect and serves no legitimate interest”.
- Justice Kaul also gave a list of valid justifications for the right to be forgotten to be violated. These included “exercising the right of freedom of expression and information, for compliance with legal obligations, for the performance of a task carried out in public interest, on the grounds [of]... public health, for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes, or for the establishment, exercise or defence of legal claims”.

#### **How have courts ruled on the issue?**



- In several isolated pleas, mostly asking the court's permission to take down information in court rulings, courts have passed orders with regard to this right.
- In **Rajagopal vs. State of Tamil Nadu (1994)**, the SC had talked about a “**right to be let alone**”. But the ruling drew a distinction between the right to be let alone and the publication of public records, such as court decisions. This is for the reason that once a matter becomes a matter of public record, the right to privacy no longer subsists and it becomes a legitimate subject for comment by press and media among others,” the two-judge Bench had held.
- In **Dharamraj Bhanushankar Dave vs State of Gujarat (2017)**, the petitioner had asked the Gujarat HC to remove details of his acquittal in a murder and kidnapping case, saying that it had come up during background checks while he was applying for an Australian visa. The court refused to grant him relief, holding that court orders are allowed to be in public domain.
- However, in [Name Redacted] vs The Registrar General, the Karnataka HC in 2017 ensured that the name of the petitioner would be protected in an annulment case. Although the court did not substantially engage with jurisprudence on the right to be forgotten, it said that the ruling is in keeping “with the trend in the Western countries where they follow this as a matter of rule...in sensitive cases involving women in general...”.
- In 2021, the Delhi HC **extended the right to be forgotten** to even a criminal case by allowing a ruling involving Jorawar Singh Mundy, an American law student, to be taken down from search results. Mundy was acquitted in a customs case involving narcotics.
- The Orissa HC in 2020, while hearing a criminal case which involved “revenge porn”, said that the legal possibilities of being forgotten “online or offline cries for a widespread debate”

## On reservations and the OBC creamy layer

**Subject: Polity**

**Sec: Constitution**

**Context:**

The allotment of **Indian Administrative Service (IAS)** to Puja Khedkar as an **Other Backward Class (OBC) Non-Creamy Layer (NCL)** candidate coupled with **multiple disabilities** has raised issues surrounding the **creamy layer in OBC reservation**.

**History of reservation:**

- **Articles 15 and 16 guarantee equality to all citizens** in any policy of the government and public employment respectively.
- In order to **achieve social justice**, they also **enable special provisions** for the advancement of **socially and educationally backward classes or OBC, Scheduled Castes (SC) and Scheduled Tribes (ST)**.
- **Reservations for SC and ST are fixed at 15% and 7.5% respectively, in jobs, educational institutions and public sector undertakings (PSU) at the central level.**
- It was in **1990, when V. P. Singh** was Prime Minister, that **27% reservation for OBC was implemented in central government employment based on Mandal Commission (1980) recommendations.**
- Subsequently in **2005, reservation was enabled for OBC, SC and ST in educational institutions including private institutions.**
- In **2019, 10% reservation was enabled for the Economically Weaker Sections (EWS) among the unreserved category.**

**Mandal Commission:**

- The Mandal Commission or the **Second Socially and Educationally Backward Classes**, was established in India in **1979 with a mandate to "identify the socially or educationally backward classes" of India.**
- It was **headed by B. P. Mandal and submitted its report in 1980 and was implemented in 1990.**
- **Recommendations of Mandal Commission:**
  - OBCs must be **provided a reservation of 27% in public sector** and government jobs.
  - They should be **provided with the same 27% reservation in promotions** at all levels of public services.
  - The reserved quota, if unfilled, should **be carried forward for a period of 3 years.**
  - OBCs should be provided age relaxation similar to SCs and STs.
  - Reservations to be made in PSUs, banks, private sector undertakings receiving government grants, colleges, and universities.
  - The government to make the necessary legal provisions to implement these recommendations.

**Creamy layer:**

- The **27% reservation for OBC** was upheld by the **Supreme Court in the Indra Sawhney case (1992)**. It opined that **caste is a determinant of class in the Indian context.**



- However, in order to uphold the basic **structure of equality**, it fixed a **cap of 50% for reservation** unless there are exceptional circumstances. The court also **provided for exclusion of creamy layer from OBC**.
- The criteria for **identifying a person as part of the creamy layer** is based on the recommendations of the **Justice Ram Nandan Prasad Committee (1993)**.
- It is determined by the **position/income of an applicant's parents alone**.
- The criteria for **belonging to creamy layer** is **parental income, excluding income from salary and agricultural income, being more than ₹8 lakh in each year in the last three consecutive financial years**.
- **Categories of applicants are also considered as belonging to creamy layer:**

(a) **parents, either of whom entered government service (centre or State) as Group A/Class I officer or parents, both of whom entered as Group B/Class II officers or father, who was recruited in Group B/Class II post and promoted to Group A/Class I before 40 years of age;**

(b) **either of the parents employed in a managerial position in PSUs;**

(c) **either of the parents holding constitutional posts.**

#### Issues:

- Some applicants **manage to obtain NCL or EWS certificate** through dubious means.
- The same may also be true with respect to disability certificates in order to **take benefit of the 4% of seats reserved for persons with disabilities in central government jobs**.
- There are also allegations of applicants and their parents adopting strategies to get around the **creamy layer exclusion like gifting of assets, taking premature retirement etc., since the applicant's or his/her spouse's income is not considered for such exclusion**.
- Concentration of **reservation benefits persists in the SC and ST category as well**. There is neither any exclusion based on 'creamy layer' for these communities.
- The reservation **at present stands at 60%, including the reservation for EWS**.

### New Governors are appointed

**Subject: Polity**

**Sec: Constitution**

**Context:**

**President Droupadi Murmu has appointed new governors for six states and shifted incumbents in three states.**

#### Constitutional Provisions Related to Governor of State

- **Articles 153-167 in Part VI of the Indian Constitution deal with the State Executive**. They also contain some key provisions related to the Governor of State.
- The constitutional provisions mentioned under these articles deal with matters related to the **appointment, qualifications, powers, functions, and other aspects** related to the office of the **Governor of State**.
- **Article 153:** There shall be a Governor for each State and the same person can be the Governor for two/more States.
  - The second part was added by the **7th Constitutional Amendment Act 1956**.
- **Article 155:** Governor of a State shall be appointed by the **President** by warrant under his hand and seal.
- **Article 156:**
  - The Governor shall hold office during the **pleasure of the President**, but his normal term of office will be **five years**.
  - The Governor may, by writing under his hand addressed to the **President, resign** his office.

#### Appointment of Governor of State

- The **Governor of State** is appointed by **the President** of India by warrant under his hand and seal.
  - Thus, the Governor is **neither directly elected by the people nor indirectly elected** by a specially constituted electoral college as is the case with **the President of India**.
- Being appointed by the Center, the **Governor of State acts as a nominee of the Central Government**.

#### Qualifications of Governor of State

The Indian Constitution lays down only two qualifications for the appointment of a person as the Governor of State:

- He should be a **citizen of India**, and
- He should have **completed the age of 35 years**.

#### Functioning of the Governor's Office over the Years

- Because the President acts with the aid and assistance of the Prime Minister and the Union Council of Ministers, **the Governor is appointed and removed by the central government**.

- The Governor enjoys certain **discretionary** powers under the Constitution (Article 163), such as giving or withholding assent to a Bill passed by the state legislature, etc.
  - These discretionary powers have resulted in **friction with the state government**.
- As a result, Governors have been seen as **acting on the behest of the central government/ as an agent of the Centre**, especially by those in opposition.

### Reforming the Office of the Governor

- **The Supreme Court has time and again** (in Shamsher Singh, SR Bommai, Nabam Rebia cases) reiterated that the office of the Governor **should be independent** on account of its high constitutional importance.
  - Recently, the courts have also held that **constitutional morality requires high functionaries** to sort out their differences and behave responsibly to better serve the citizens.
  - This would require clearly laying down the norms.
- The perception of bias in the **appointment of the Governor could be addressed** by appointing the Governor **from a body comprising representatives** of both the states and the Centre and also from the judiciary to ensure fair play.
  - This would ensure that **cooperative federalism** is at play which has worked quite well for India in terms of GST reform which functions through the **GST Council** with representatives of both the Centre and the states.
- Impartiality and independence of the office could be ensured by providing **security of tenure**.
  - This has worked quite well in India where the **judges of the HCs and the SC** and some other constitutional functionaries are given this status.
  - This would mean that Governors make their decision in the public interest rather than in the political interest.
- **The removal of the Governor could be done by the appointing committee**. This again would ensure that both the Centre and the state have a say in the removal of the Governor.

### SC declines to grant interim stay of Patna HC decision quashing 65% quota in Bihar

**Subject: Polity**

**Sec: Constitution**

**Context:**

The Supreme Court refused to order interim stay of a Patna High Court decision quashing reservation up to 65% for Backward Classes, Extremely Backward Classes, Scheduled Castes and Scheduled Tribes in public employment and institutions

**More on News:**

- The High Court had concluded that stretching quota from 50% to 65% in government jobs and educational institutions, leaving only 35%, for merit was violative of the right to equal opportunity for citizens.
- The High Court had set aside the Bihar Reservation of Vacancies in Posts and Services (for Scheduled Caste, Scheduled Tribes and Other Backward Classes) Amendment Act, 2023 and The Bihar (In admission in Educational Institutions) Reservation (Amendment) Act, 2023 as ultra vires the constitution and violative of equality clause under Articles 14, 15 and 16 of the Constitution.

**Bihar Reservation Laws:**

- These laws are the Bihar Reservation of Vacancies in Posts and Services (for Scheduled Castes, Scheduled Tribes and Other Backward Classes) Amendment Act-2023 and the Bihar (in admission in educational institutions) Reservation Amendment Act, 2023.
- Under the amended Act, there will be a total of 65% reservation in both the cases, including 20% for Scheduled Castes, 2% for Scheduled Tribes, 18% for Backward Classes and 25% for Extremely Backward Classes.
- Apart from this, EWS (people from economically weaker general category) already approved under the Central Act will continue to get 10 % reservation.

**Reservation:**

- Reservation is a form of **positive discrimination**, created to promote equality among marginalised sections and to protect them from social and historical injustice.
- It gives preferential treatment to marginalised sections of society in employment and access to education.
- It was also originally developed to correct years of discrimination and to give a boost to disadvantaged groups.

**Constitutional Provisions Related to Reservations in India:**

- **Part XVI** of the Constitution of India deals with the reservation of SC and ST in Central and State legislatures.
- **Right to equality (Articles 14–18)**
- **Article 15** of the Constitution empowers the State to make the following provisions:

- **Article 15(3)** provides special provision for **women and children**.
- **Article 15(4) and Article 15(5)** provides special provision for the advancement of **any socially and educationally backward classes** of citizens or for the SCs and the STs, including their admission to educational institutions, including private ones.
- **Article 15(6)** provides special provisions for the advancement of **Economically Weaker Sections (EWS) any of citizens other than the classes mentioned in clauses (4) and (5)**.
- **Article 16** provides for the grounds of **positive discrimination or Reservation in government jobs**.
  - **Article 16(4)** provides for the reservation of appointments or posts in favour of any **backward class of citizens**.
  - **Article 16(4A)** provides for reservation in promotion for **Scheduled Castes and Scheduled Tribes**.
    - The Constitution was amended by the **Constitution (77<sup>th</sup> Amendment) Act, 1995** and a **new clause (4A)** was inserted in **Article 16** to enable the government to provide reservation in promotion.
    - Later, **16(4A)** was modified by the **Constitution (85<sup>th</sup> Amendment) Act, 2001** to provide **consequential seniority to SC and ST candidates promoted by giving reservation**.
  - **Article 16 (4B)** allows states to consider unfilled reserved vacancies from a previous year meant for SCs and STs.
    - It was inserted by the **81<sup>st</sup> Constitutional Amendment Act, 2000**.
  - **Article 16(6)** provides for the reservation of appointments or posts in favour of any **Economically Weaker Sections (EWS)**.
- **Article 233T** provides reservation of seats for **SCs and STs in every Municipality**.
- **Article 243D** provides reservation of seats for **SCs and STs in every Panchayat**.
- **Article 335** of the constitution says that the claims of SCs and STs shall be taken into consideration consistently with the maintenance of efficacy of the administration.
- **Articles 330 and 332** provide for specific representation through the reservation of seats for SCs and STs in the **Parliament and State Legislative Assemblies**

### What is on the agenda for the 16th Finance Commission?

#### Sub: Polity

#### Sec: Federalism

#### Context:

- The 16th Finance Commission (FC) has begun its work, established under Article 280 of the Indian Constitution, primarily focusing on the devolution of the consolidated fund.

#### More on news:

- Since the 73rd and 74th constitutional amendments, local bodies have gained significant recognition within the federal system.
- These amendments introduced sub-clauses 280(3)(bb) and (c), which mandate the FC to recommend measures to augment State consolidated funds for supporting panchayats and municipalities.

#### What about cities?

- The National Commission on Urbanisation in the mid-80s described cities as “engines of growth.”
- Cities contribute around 66% of India’s GDP and about 90% of total government revenues.
- Cities, thus, are an important spatial zone for the overall development of the country. However, our economic scale is insufficient to meet rising needs.

#### What about the taxation system?

- The introduction of the Goods and Service Tax (GST) has reduced ULBs’ tax revenue (excluding property tax) from about 23% in 2012-13 to around 9% in 2017-18.
- IGTs from States to ULBs are very low, with State Finance Commissions recommending only about 7% of States’ own revenue in 2018-19.
- Increasing the quantum of IGTs as a percentage of GDP is necessary.
- Despite the 74th constitutional amendment’s aim to financially strengthen ULBs, progress over three decades has fallen short.
- The 13th Finance Commission observed that parallel agencies and bodies are emasculating local governments both financially and operationally.
- Local governments require support from Union and State governments through funds, functionaries, and technical aid.

#### How important is the Census?

- In the absence of the 2021 Census, reliance on 2011 data is inadequate for evidence-based fiscal devolution.
- India has approximately 4,000 statutory towns and an equal number of Census towns, with an estimated 23,000 villages, all of which are effectively urban.
- These figures must be captured by the 16th FC, including the significant migration to Tier-2 and 3 cities.

#### About Finance Commission:

- **The Finance Commission is a constitutional body under Article 280** created every five years to recommend the transfer of financial resources from the Centre to the States.
- The Commission also decides the principles on which grants-in-aid will be given to the States.
- The **State Finance Commission (SFC) is an institution created by the 73rd and 74th Constitutional Amendments (CAs)** to rationalize and systematize State/sub-State-level fiscal relations in India.
- **Article 243I of the Constitution** mandated the State Governor to constitute a Finance Commission every five years.
- **Article 243Y of the Constitution** states that the Finance Commission constituted under article 243 I shall also review the financial position of the Municipalities and make recommendations to the Governor.

#### The Problem of Special Packages

##### Sub: Polity

##### Sec: Federalism

- **Coalition Politics Returns:**
  - **Bharatiya Janata Party (BJP)** relies on **Janata Dal (United) of Bihar** and **Telugu Desam Party of Andhra Pradesh** for a parliamentary majority.
  - Contrast to 2014 and 2019 when single-party governments were in power.
- **Revival of State-Specific Grants:**
  - **Demand for State-specific discretionary grants or 'special packages'** has resurfaced in public discussion.
  - Single-party dominance provided a check on such practices, but coalition politics revives them.
- **Federal Structure and Fiscal Policies:**
  - A healthy federal structure requires transparent fiscal boundaries, principles of tax assignment, and grant distribution.
  - The **Constitution** provides for addressing specific States' issues through Articles **371A to H** (Article 370 for Jammu and Kashmir is abrogated).
- **Nature of Special Packages:**
  - **Special packages are discretionary** and often result from political bargaining power rather than genuine need.
  - Granted under **Article 282** ('Miscellaneous Financial Provisions').
- **Impact on Fiscal Federalism:**
  - **Election outcomes influencing fiscal distribution** contradicts the principles of fiscal federalism.
  - Allocation of funds should be through the **Finance Commission**, constituted every five years as per **Article 280**.
- **Double-Engine Sarkar and Its Implications:**
  - The term describes when the same political party governs both Union and State levels.
  - The coalition now requires negotiations with smaller parties for political stability.
- **Federal Tendencies in Polity:**
  - The **Constitution** is quasi-federal, but assumes a federal character outside emergencies.
  - **Supreme Court** has noted that polity can be both unitary and federal based on the situation (State of Rajasthan and Others v Union of India, 1977).
- **Determining Fiscal Distribution:**
  - Concerns about the **divisible pool of Union taxes** and States' shares.
  - The 16th Finance Commission must balance interests of States and the Centre.
- **Discretionary Grants and Fiscal Federalism:**
  - The **Finance Commission** is responsible for recommending grants to States in need.
  - Discretionary grants under Article 282 have far outpaced those recommended by the Finance Commission.
  - Acceding to special package demands weakens fiscal federalism and diverts resources from other needy States.
- **Potential Consequences:**

- **Federal tendencies** might wilt instead of blooming when single-party dominance fades if special packages become common practice.

### Key Constitutional Articles

- **Article 280: Finance Commission**
  - **Purpose:** Provides for the constitution of a Finance Commission by the President every five years.
  - **Functions:**
    - Recommends the distribution of the net proceeds of taxes between the Union and the States, and among the States themselves.
    - Determines the principles that should govern grants-in-aid of the revenues of the States out of the Consolidated Fund of India.
    - Any other matter referred to the Commission by the President in the interests of sound finance.
- **Article 275: Grants from the Union to Certain States**
  - **Provision:**
    - Allows for grants-in-aid from the Union to any State that is in need of assistance, as determined by the Parliament.
    - The grants can be charged on the Consolidated Fund of India.
- **Article 282: Expenditure Defrayable by the Union or a State out of its Revenues**
  - **Purpose:**
    - Allows the Union or a State to make any grants for any public purpose, even if it is not within their legislative competence.
  - **Usage:**
    - *Grants under this article are often used for discretionary purposes*, such as special packages.
- **Articles 371A to H: Special Provisions for Specific States**
  - **Purpose:** Provide special provisions for specific States to address unique circumstances and needs.
- **Article 371A: Special Provisions for Nagaland** - Safeguards the religious and social practices, customary laws, and the administration of civil and criminal justice of the Naga people.
- **Article 371B: Special Provisions for Assam** - Ensures equitable distribution of legislative and executive powers between the Union and the state government.
- **Article 371C: Special Provisions for Manipur** - Ensures autonomy over the administration and laws related to land and its resources.
- **Article 371D: Special Provisions for Andhra Pradesh** - Provides equitable opportunities in education and public employment.
- **Article 371E: Special Provisions for Sikkim** - Safeguards ownership rights over land and resources and preserves its unique cultural identity.
- **Article 371F: Special Provisions for Mizoram** - Safeguards religious and social practices, customary laws, and administration of civil and criminal justice.
- **Article 371G: Special Provisions for Arunachal Pradesh** - Safeguards its religious and social practices, customary laws, and administration of civil and criminal justice.
- **Article 371H: Special Provisions for Goa** - Ensures equitable opportunities in education and public employment and safeguards its Konkani language and culture.
- **Article 371I: Special provisions for the state of Maharashtra and Gujarat** - Providing for equitable opportunities in education and public employment for certain regions.
- **Article 371J: Special Provisions for Karnataka** - Ensures equitable opportunities in education and public employment for certain regions.

### No case is made out for special category status for Bihar, Govt tells Parliament

#### Sub: Polity

#### Sec: Federalism

**Context:** On the eve of the Union Budget presentation, the government told Parliament on Monday that the case for special category status for Bihar is not made out.

#### Details:

- The minister said the special category status for plan assistance was granted in the past by the NDC to some states that were characterised by a number of features necessitating special consideration.



- Earlier the request of Bihar for special category status was considered by an inter-ministerial group (IMG), which submitted its report on March 30, 2012. The IMG came to the finding that based on existing **NDC (National Development Council) criteria**, the case for special category status for Bihar is not made out

**What are criteria for special category status ?**

**These included hilly and difficult terrain, low population density or sizeable share of tribal population, strategic location along borders with neighbouring countries, economic and infrastructural backwardness and non-viable nature of state finances**

## **219 proposals for High Court judge appointment under process: govt**

**Subject: Polity**

**Sec: JUDICIARY**

**Context:**

**Chief Justices of the High Courts are required to initiate the proposal to fill up a vacancy of a High Court judge six months prior to the occurrence of vacancy.**

**More on News:**

- **Names recommended by the High Court Collegium** are sent with the **views of the government to the SCC for advice.**
- **Recommendation of the SCC is mandatory for appointment.**
- **Appointment of Judges in the High Courts is a continuous, integrated and collaborative process, involving approval from various constitutional authorities.**
- The process of **finalising a revised Memorandum of Procedure for Appointment of Judges to the Supreme Court and High Courts** to bring in **more transparency and accountability** in the appointment process has not seen the light of the day.
- The decision to **reexamine the Memorandum of Procedure** was taken after the Supreme Court struck down the **National Judicial Appointments Commission law in 2015.**

**Appointment of High Court Judges:**

- The appointment of High Court judges is a collaborative process involving the **Chief Justice of India (CJI), the Supreme Court Collegium, the Union Government, and the President of India.**
- The CJI heads the **Supreme Court Collegium, a body of senior judges** responsible for recommending candidates for judicial appointments.
- The Union Government, through the **Ministry of Law and Justice**, processes these recommendations and **forwards them to the President for final approval.**
- **Articles 124(2) and 217 of the Indian Constitution** deal with the **appointment of judges to the Supreme Court and High Courts .**
- **Constitutional Provisions for Judicial Appointments**

**Article 124**

- **Supreme Court judges should be appointed by the President after consultation with such judges of the High Courts and the Supreme Court as the President may deem necessary. The CJI is to be consulted in all appointments except his or her own.**

**Article 217**

- **High Court judges should be appointed by the President after consultation with the CJI and the Governor of the state. The Chief Justice of the High Court concerned too should be consulted.**

**National Judicial Appointment Commission Act, 2014:**

- **The 1993 judgment** was the basis on which a **five-judge Constitution Bench** declared the **National Judicial Appointments Commission Act (NJAC)** and the **Constitutional (Ninety-Nine Amendment) Act, 2014 unconstitutional in October 2015.**
- **NJAC too would recommend names for the Appointment of Supreme Court Judge and Appointment and Transfer of High Court Judge**
- **Composition of NJAC**
  1. **The Chief Justice of India**
  2. **2 senior-most judges of the Supreme Court**
  3. **The Law Minister of India**
  4. **2 eminent members that are chosen by the Selection Committee**



## Trinamool MLAs sworn in by Speaker; Governor cries foul

**Sub: Polity**

**Sec: Parliament and Legislature**

**Context:**

- West Bengal Governor CV Ananda Bose on 5th July cried foul as the Speaker administered the oath to two newly elected Trinamool Congress legislators, instead of the Deputy Speaker who had been authorized by the governor for the job.

**Key Highlights:**

- A report is being sent to the Hon'ble President about the Constitutional impropriety of the Speaker in administering the oath of affirmation to the newly elected MLAs.
- The oath was administered under rule 5 of the Rules of Procedural Conduct of Business of The West Bengal Legislative Assembly.
- Governor cited that the oath was violative of Article 188 of the Constitution.
- Leader of Opposition Suwendu Adhikari said that the administering of the oath to the MLAs was done by an illegal process and he would take it up in his official capacity.

**Constitutional Provisions:**

- Article 188 of the Constitution states that every member of the Legislative Assembly or the Legislative Council of a State shall, before taking his seat, make and subscribe before the Governor, or some person appointed in that behalf by him, an oath or affirmation according to the form set out for the purpose in the Third Schedule.

## The House Rules governing the expunction powers of Rajya Sabha Chairman, Lok Sabha Speaker

**Sub: Polity**

**Sec: Parliament and legislature**

**Context:**

- The first special session of the 18th Lok Sabha witnessed heated discussions, with the Opposition clashing with the government over a range of issues while debating the Motion of Thanks to the President's joint address.

**What is meant by Expunction?**

- Expunction means removal from the records of Parliament a word or portion or entire speech delivered by the MPs in the respective House.
- It is exercised upon by the orders of the Speaker or Chairman and is carried out in accordance with laid down rules.
- The expunged portions can no longer be reported by media houses, even though they may have been heard during the live telecast of the proceedings.
- The practice of expunging remarks is a standard parliamentary procedure.
- However the 'selective expunction' by the presiding officers has become a flashpoint between the Opposition and the Centre.
- Anyone who publishes them thereafter is liable to face charges for breach of privilege of the House.

**When are remarks expunged from parliamentary records?**

- Parliament maintains a verbatim record of everything that is spoken and takes place during proceedings.
- Article 105 of the Constitution confers certain privileges and freedom of speech in Parliament on MPs.
- If an MP makes an allegation against their colleague or an outsider, Rule 353 of the Lok Sabha outlines the procedural framework to be followed.
- The only requirement is advance notice, on receipt of which the Minister concerned will conduct an inquiry into the allegation and come up with the facts when the MP makes the allegation in the House.
- The Lok Sabha Secretariat maintains a comprehensive list of 'unparliamentary' words and expressions.

**What happens if the remark is against a Minister?**

- The Rules on Expunging does not apply to an allegation against a Minister in the government.
- This is because the Council of Ministers is accountable to Parliament, and the Members of the House have the right to question Ministers and make accusations against their conduct as Ministers.

**How do presiding officers expunge remarks?**

- **Rule 261 states that If the Chairman of the Rajya Sabha** is of opinion that a word or words have or have been used in debate which is or are defamatory or indecent or unparliamentary or undignified, he may in his discretion, order that such word or words be expunged from the proceedings of the Council.
- **Rule 380 states that If the Speaker of the Lok Sabha** is of the opinion that words have been used in debate which are defamatory or indecent or unparliamentary or undignified, the Speaker may, while exercising discretion, order that such words be expunged from the proceedings of the House.
- **As per the Rule 381** the expunged portions are marked by asterisks with an explanatory footnote stating ‘expunged as ordered by the Chair.’

## SC to consider setting up bench to hear pleas against passage of laws as money bills

### Sub: Polity

#### Sec: Parliament and legislature

#### Context:

The Supreme Court on Monday agreed to consider a submission for setting up a constitution bench to hear pleas challenging the validity of passage of laws like the Aadhaar Act as money bills allegedly to bypass the Rajya Sabha.

Earlier, the top court had said it would constitute a **seven-judge bench** to consider the issue of validity of passage of laws like the **Aadhaar Act as a money bill**.

The decision was aimed at addressing the controversy around money bills after the government introduced legislations like the **Aadhaar Act** and even amendments to the **Prevention of Money Laundering Act (PMLA)** as money bills, apparently to circumvent the Rajya Sabha where it did not have a majority then.

#### About money bill

A Bill is said to be a Money Bill under **Article 110** of the constitution if it only contains provisions related to taxation, borrowing of money by the government, expenditure from or receipt to the Consolidated Fund of India.

#### Qualification as money bill:

1. Under Article 110(1) of the Constitution, a Bill is deemed to be a Money Bill if it contains only provisions dealing with all or any of the following matters: the imposition, abolition, remission, alteration or regulation of any tax
2. regulation of borrowing by the government
3. custody of the Consolidated Fund or Contingency Fund of India, and payments into or withdrawals from these Funds
4. appropriation of moneys out of the Consolidated Fund of India
5. declaring of any expenditure to be expenditure charged on the Consolidated Fund of India or the increasing of the amount of any such expenditure
6. receipt of money on account of the Consolidated Fund of India or the public account of India or the custody or issue of such money or the audit of the accounts of the Union or of a State
7. any matter incidental to any of the matters specified in sub-clauses (a) to (f).

#### Power to decide money bill

- The speaker of the Lok Sabha decides if a bill is money bill or not (Art 110 (3)) and his decision in this regard is final.

#### Power of Rajya Sabha w.r.t Money Bill

- Under Article 109 (1), a **Money Bill cannot be introduced in Rajya Sabha**.
- Once passed by Lok Sabha, it is sent to Rajya Sabha — along with the Speaker’s certificate that it is a Money Bill — for its recommendations.
- However, **Rajya Sabha can neither reject nor amend the Bill**, and must return it within 14 days, after which Lok Sabha may choose to accept or reject all or any of its recommendations.
- In either case, the Bill is deemed to have been passed by both Houses.
- Under Article 109(5), **if Rajya Sabha fails to return the Bill to Lok Sabha within 14 days, it is deemed to have been passed anyway**.

#### What is Finance Bill:

- In a general sense, any **Bill that relates to revenue or expenditure is a financial Bill**.
- A **money Bill** is also a **specific type of financial Bill**, that **must deal only with matters specified in Article 110 (1) (a) to (g)**.
- Financial bills are **responsible for fiscal matters** such as government spending or revenue.
- It **specifies the amount of money to be spent** by the government and the way it is to be spent.
- More specifically, **Article 117 of the Constitution deals with the special provisions relating to financial Bills**.

- Finance Bills are **divided into three categories**: the **Money Bill**, **Finance Bill Category I**, and **Finance Bill Category II**.

#### What is the difference between money Bills and financial Bills:

- **Classification Distinction:** Money Bills encompass **tax-related provisions**, while **Financial Bills** cover various subjects, including **taxation and expenditure**. The **Finance Bill**, solely dealing with **tax proposals**, qualifies as a **Money Bill**. For e.g The **Compensatory Afforestation Fund Bill, 2015**, which establishes funds and covers other issues, was introduced as a **Financial Bill**.
- **The procedure for the passage:**
  - **Money Bill:** The **Rajya Sabha** cannot amend or reject **Money Bills**. It offers **non-binding recommendations** within **14 days**, but if the **Lok Sabha** declines them, the Bill passes as is.
  - **Financial Bill:** It must be approved by both houses.
- **Origination and President's Recommendation:**
  - **Money Bill:** Must be introduced only in the **Lok Sabha**, and only the **Presidential recommendation**
  - **Financial Bill:** An ordinary bill can originate in either house, and the **President's recommendation** is not required for **tax-related amendments**.

### West Bengal governor questions legality of TMC MLAs' oath, imposes Rs 500 fine on attending Assembly

#### Sub: Polity

#### Sec: Parliament and state legislature

**Context:** CV Ananda Bose questioned Speaker Biman Banerjee administering oath to the legislators when he had authorised Deputy Speaker Asish Banerjee to do so.

#### Details:

- Weeks after Trinamool Congress MLAs Sayantika Banerjee and Reyat Hossain Sarkar were sworn in, West Bengal Governor CV Ananda Bose has questioned the legality of the process and asked the leaders to pay a fine of Rs 500 each day they take part in Assembly proceedings.
- There has been an impasse with the governor regarding the swearing-in of the newly-elected MLAs. While Bose had invited the two MLAs to take the oath at the Raj Bhavan in Kolkata, they declined and instead asked him to administer the oath to them in the Assembly or authorise Biman Banerjee to do so.
- The Assembly speaker had summoned a special session amid the impasse. Hours after the announcement of the session, Bose had authorised Deputy Speaker Asish Banerjee to administer the oath to the MLAs.
- The governor in a letter to the MLAs said that the speaker had "no jurisdiction in the matter" as the "constitutional head of the state designated someone to administer the oath".

#### What does constitution say on this matter?

#### As per Article 188

Every member of the Legislative Assembly or the Legislative Council of a State shall, before taking his seat, make and subscribe before the **Governor, or some person appointed in that behalf by him**, an oath or affirmation according to the form set out for the purpose in the **Third Schedule**.

#### No-confidence motion against West Bengal Speaker Biman Banerjee

#### Subject: Polity

#### Sec: Legislature

#### Context:

West Bengal BJP MLAs moved a **no-confidence motion** against Assembly Speaker **Biman Banerjee**. Their letter addressed to the **Principal Secretary** stated, "**this House regretfully disapproves of the conduct of Shri Biman Banerjee and resolves that he be removed from the office.**"

#### More on News:

- The no-confidence motion said the Speaker was "**arbitrarily disallowing** all types of adjournment motions intending to discuss **issues of public importance and problems concerning the people of the State.**"

#### No confidence motion:

- In a **parliamentary democracy**, a government can be **in power only if it commands a majority in the directly elected House**.
- It is a parliamentary process that **allows the opposition to challenge the government's majority**.
- If the **no-confidence motion** is passed in the **Parliament**, then the **government must resign**.

- **Article 75(3)** of our Constitution embodies this rule by **specifying that the Council of Ministers are collectively responsible to the Lok Sabha.**
- For testing this collective responsibility, the **rules of Lok Sabha provide a particular mechanism – a motion of no-confidence.**
- **A no confidence motion can only be moved in the Lok Sabha.**

#### **Procedure for passing a NCM:**

- **Support** - Any Lok Sabha MP who can garner the support of 50 colleagues can introduce a motion of no-confidence against the Council of Ministers.
- It is moved in writing and must be signed by the member moving it, the motion is submitted to the Speaker of Lok Sabha on any day on which the House is sitting.
- **Power of Speaker** - He will decide whether to admit the motion for discussion and debate.
- If the motion is admitted, the Speaker will decide on the date and time for discussion.
- **Date** - This date for discussion should be within 10 days from the date the motion was accepted in the House.
- **Time for discussion** - The Speaker may grant time for discussion of the motion under Rule 198 of Lok Sabha.
- **Debate** - The motion will be debated in the Lok Sabha and it will be moved by the member who submitted it.
- Government will respond to the motion, the opposition parties will then have the opportunity to speak on the motion.
- **Vote** - After the debate, the Lok Sabha will vote on the NCM, it will be passed if it is supported by the majority of the members of the House.
- **If NCM is passed –The Government must resign.**
- **If Government wins the vote – The motion is defeated and the Government remains.**

#### **History of no confidence motion (NCM):**

- Since **Independence 27 NCMs have been moved in the Lok Sabha.**
- **First NCM** - It was during the **3<sup>rd</sup> Lok Sabha in 1963** that the **first motion of no confidence was moved by Acharya J B Kripalani against the government headed by Prime Minister Jawaharlal Nehru.**

#### **Highest number of instances:**

- **Indira Gandhi- Faced NCMs 15 times.**
- **Lal Bahadur Shastri- Faced 3 times.**
- **PV Narashima Rao- Faced three times.**
- In **1979, Prime Minister Morarji Desai** realised that he did not have the support of the **majority of MPs**, and therefore **resigned before the House voted on the motion.**
- **Governments fallen due to NCM**
- **V P Singh government in 1990**
- **H D Deve Gowda government in 1997**
- **Atal Bihari Vajpayee government in 1999**
- Most recent **NCM was moved in 2018 by Telugu Desam Party against the National Democratic Alliance (NDA) government.**

### **What are new provisions for police officers under BNSS?**

**Sub: Polity**

**Sec: legislation in news**

**Context:**

- The **new criminal laws** have become effective from **July 1.**
- SOPs have been issued by the **Bureau of Police Research and Development (BPRD)** to guide police officers in implementing the new provisions.

#### **New provisions for police officers**

##### **Rules for registering FIRs:**

- Under **Bharatiya Nagarik Suraksha Sanhita (BNSS)** **section 173** provides for registration of FIR **irrespective of jurisdiction.**
- The **officer in-charge** of a police station **cannot refuse to register an FIR** on the basis of lack of jurisdiction or disputed jurisdiction.
- **He is legally bound** to register (popularly known as a **zero FIR**) and transfer such a case to the respective police station.

- The information can be given **orally, written or in electronic mode**.
- The **electronic mode** by which information may be given must be decided by the agencies, such as the **Crime and Criminal Tracking Network and Systems (CCTNS)** portal, the police website or officially published email IDs.

#### Rules for videography:

- The **BNSS mandates videography during a search conducted by the police under Section 185**.
- A **cloud-based** mobile app, 'eSakshya' has been designed by the **National Informatics Centre for enforcement agencies**, which allows capturing multiple photos and videos.
- Since **eSakshya** is an initiative under the **Inter-operable Criminal Justice System (ICJS)**, this data will be available to other agencies such as the **judiciary, prosecution and cyber forensic experts**.

#### Provisions of arrest:

- Information about arrested persons is to be **mandatorily displayed in police stations**.
- **Section 37 of the BNSS** requires a **police officer** in every police station, **not below the rank of Assistant Sub-Inspector**, to be responsible for **maintaining** and prominently displaying **information about the arrested persons**.
- **Boards** (including in digital mode) **containing names, addresses and the nature of the offense** must be put up outside police stations and district control rooms.
- Permission of an **officer not below the rank of DySP is mandatory** for arresting a person charged with an offense punishable for **imprisonment of less than three years** if such person is infirm or is **above 60 years of age**.
- Law now provides for the **use of handcuffs in certain cases**, the **IOs (Investing Officer)** must use them **cautiously**.

#### Rules related to timelines:

- In case of medical examination of a **victim of rape**, the registered medical practitioner need to forward the medical report to the **IO within seven days**.
- The **investigation of POCSO cases** is required to be completed **within two months** of recording the information of the offense.

#### Rules regarding terrorism:

- **Bharatiya Nyaya Sanhita (BNS)** defines what is a **'terrorist act'** and imposes the duty on an officer, **not below the rank of Superintendent of Police (SP)**, to decide whether to **register a case** under this Section or the **UAPA**.

### What is the draft Digital Competition Bill?

#### Sub: Polity

#### Sec: Legislation in news

#### Context:

- **India's proposed Digital Competition Bill, 2024** aims to prevent tech giants like Google, Facebook, and Amazon from engaging in **anti-competitive practices**.

#### More on news:

- In February 2023, the **Ministry of Corporate Affairs (MCA)** constituted a **Committee on Digital Competition Law (CDCL)** to examine the need for a separate law on competition in digital markets.
- The CDCL suggested a need to supplement the current ex-post framework under the **Competition Act, 2002 with an ex-ante framework**.
- It laid out this **ex-ante framework in the draft Digital Competition Bill**.

#### What is an ex-ante framework?

- **The Competition Act, 2002** is based on an **ex-post framework** which means that the **CCI can use its powers of enforcement only after the anti-competitive conduct has occurred**.
- However in the case of digital markets, the **CDCL has advocated for an ex-ante competition**
- This means that the CCI's enforcement powers to be supplemented such that it allows it to **pre-empt and prevent digital enterprises** from indulging in anti-competitive conduct in the first place.
- The **European Union** is the **only jurisdiction** where a comprehensive **ex-ante competition** framework, under the **Digital Markets Act**, is currently in force.

#### Key provisions of India's Digital Competition Bill, 2024.

- **Inspired by the EU:**
  - The draft Bill follows the template of the **EU's Digital Markets Act**.
  - It does not intend to **regulate all digital enterprises**, and places obligations **only on those that are "dominant"** in digital market segments.



- **Identifying Core Digital Services:**
  - At present, the draft Bill identifies **ten ‘core digital services’** such as online search engines, social networking services, video sharing platform services etc.
  - The quantitative standards for the **CCI to identify dominance of digital enterprises** are based on the **‘significant financial strength’** test which looks at financial parameters and **‘significant spread’** test based on the number of users in India.
  - These core core digital services will be designated as **Systemically Significant Digital Enterprises (SSDEs)**.
- **Provisions for SSDEs:**
  - The primary obligation of SSDEs is to not indulge in anti-competitive practices.
  - The draft Bill **prohibits SSDEs from favoring its own products** on its platform over those of third parties (**self-preferencing**).
  - It imposes **restrictions on availability of third party applications** and does not allow users to change default settings.
  - It provides for **restricting businesses** users of the service from **directly communicating with their end users (anti-steering)** and tying or bundling of non-essential services to the service being demanded by the user.
- **Designation of Associate Digital Enterprises (ADE):**
  - If an enterprise being **designated as an SSDE** is part of a group, and one or more other enterprises within such a group are **directly or indirectly involved in the provision of the Core Digital Service** in India, the CCI may designate these **enterprises as ADEs**.
  - **Entities benefiting from data shared by a major tech group will be designated as ADEs.**
  - **ADEs will have the same obligations as SSDEs.**

## What does Maharashtra’s Public Security Bill stipulate?

**Sub: Polity**

**Sec: Legislation in news**

**Context:**

- **Maharashtra government** had tabled the **Maharashtra Special Public Security (MSPS) Act, 2024**, aimed at curbing the **‘menace of Naxalism’** in urban areas.

**More on the news?**

- The provisions of the proposed Bill, which allows the **State to declare any organization as ‘unlawful’ with offenses categorized as cognisable and non-bailable**, has raised concerns and is being dubbed the **‘urban naxal’ law**.
- The **Maoist-hit States of Andhra Pradesh, Telangana, Chhattisgarh and Odisha** have already implemented **Public Security Acts** to prevent unlawful activities.

**Why was the Bill proposed?**

- The bill aims to curb **Urban Maoism/Naxalism**.
- The presence of, and activities carried out, by **Naxalites or the CPI (Maoist), in urban areas** are together termed as **Urban Maoism/Naxalism**.

**What are key provisions of Maharashtra Special Public Security Bill, 2024?**

- **Declaration of Unlawful Organizations:**
  - The Bill grants the **state the authority to declare an organization as “unlawful”** — a decision which can be **reviewed by an advisory board** set up by the **state government**.
- **Definition of Unlawful Activities:**
  - Activities which constitute a **danger or menace to public order, peace and tranquility**.
  - **Interference with law administration** and public servants.
  - **Violence, vandalism, use of firearms, explosives**, and disruption of transportation.
  - Encouraging **disobedience to law** and institutions.
  - Collecting **funds or goods for unlawful activities**.
- **All offenses under the new bill are cognizable and non-bailable:**
  - All offenses under the new bill will be **cognizable and non-bailable**, and will be **investigated by a police officer** not below the **rank of a Sub-Inspector**.
- **Provision for punishment:**



- The offenses covered in the bill carry sentences ranging from two to seven years, along with fines between ₹2 lakh and ₹5 lakh.
- **Seizure and Forfeiture:**
  - If an organization has been declared as unlawful, the District Magistrate or Commissioner of Police can notify and “take possession of” any place “used for its activities”.
  - Government can forfeit money and assets intended for unlawful organizations.
- **Legal Review:**
  - According to the Bill, an advisory board will be set up comprising three persons “who are or have been or qualified to be appointed as judge of the high court”.
  - Within six weeks of declaring an organization as unlawful, the government will have to make a reference to the board, which will then have to submit a report within three months after going through the evidence placed before it and hearing the persons involved in the organization.

**How is the MPSS Bill different from the UAPA?**

- In the MSPS Act, an advisory board of three persons who are or have been qualified to be appointed as judges of the High Court shall oversee the confirmation process, while under UAPA, a tribunal led by a High Court judge verifies the State’s declaration.
- If the proposed legislation is passed, it would allow the State police and security agencies to arrest individuals without a warrant and often without informing them of the charges.

### Digital Personal Data Protection (DPDP) Bill: Key Aspects and Implications

**Sub: Polity**

**Sec: Legislation in news**

**Consent Notices:**

- The new DPDP law mandates that firms, including mobile app developers, e-commerce platforms, and social media companies, must issue **consent notices** to users.
- These notices must **explain the types of personal data being collected, the purposes for data usage, and how users can withdraw their consent.**
- **Detailed Data Disclosure:**
  - **Data fiduciaries** (firms collecting data) are required to obtain explicit consent from **data principals** (users) for each item of personal data collected.
  - For example, firms must **clearly state the purpose** for collecting data such as a user’s name, email address, credit card details, and residential address.
- **Increased Compliance Costs:**
  - Compliance with these regulations is expected to increase operational costs for companies as they will need to create detailed consent notices and ensure transparent and justified data collection practices.
  - This requirement is intended to **prevent indiscriminate data collection**, such as accessing contact lists or location data without clear relevance to the provided service.
- **User Empowerment:**
  - The bill ensures that users are **informed about the data collection, the risks and benefits** of sharing their data, and their **rights regarding data retention and deletion.**
  - Users have the right to request data erasure once its collection purpose is fulfilled, unless **legal obligations require retention.**
- **Pending Modifications and Implementation:**
  - Although the DPDP Act was passed last year, the regulatory framework, including specific rules for **processing children’s data** and the **reporting timeline for data breaches**, is still being finalized.
  - The delay in finalizing these rules has left users without a comprehensive framework to **safeguard their personal data.**

**Conclusion:** The DPDP Bill emphasizes user **consent and transparency, aiming to curb the misuse of personal data.**

However, the implementation **may pose challenges for businesses in terms of compliance costs and operational adjustments.** **The finalization of the regulatory framework will be crucial in defining the practical implications of the bill.**

### How do Assam’s Foreigners Tribunals function?

**Sub: Polity**

**Sec: National body**

#### Context:

- The Assam government asked the **Border wing of the State's police** not to forward cases of **non-Muslims** who entered India illegally before 2014 to the **Foreigners Tribunals (FTs)**.

#### What are the Foreigners Tribunals?

- Foreigners Tribunals are **quasi-judicial bodies** set up under the **Foreigners' Tribunal Order, 1964** and the **Foreigners Act, 1946** to enable **state administration** to refer to a person **suspected of being a foreigner**.
- It is currently **functioning only in the state of Assam** presently.
- **Each FT is headed** by a member drawn from **judges, advocates, and civil servants** with judicial experience.
- The Tribunal **possesses the power of Civil Court** while trying a suit.
- It can **summon and request the attendance** of **any individual** and examine him/her on oath.
- The Tribunal **can request anyone** to produce the **necessary documents**.
- A tribunal is required to **serve a notice in English** or the **official language of the State** to a person alleged to be a foreigner **within 10 days of receiving** the reference.
- Such a person has **10 days to reply to the notice** and **another 10 days to produce evidence** in support of his or her case.
- An FT **has to dispose of a case within 60 days** of reference.
- If the **person fails to provide any proof of citizenship**, the FT can send him or her to a **detention center**, now called **transit camp**, for deportation later.

#### 2019 Amendment to The (Foreigners Tribunals) Order, 1964

- **District Magistrates** have the **authority to establish Foreigners Tribunals** in their respective area of operation to determine the **legality of a person's citizenship status**
- An **individual** can now in their own capacity file an appeal in **FTs to prove their citizenship if left out of NRC(Assam)**.

#### What is the role of the Border police?

- The **Assam Police Border Organisation** was established as a part of the **State police's Special Branch** in **1962** under the **Prevention of Infiltration of Pakistani (PIP) scheme**.
- It was made an **independent wing in 1974** and is headed by the **Special Director General of Police (Border)**.
- The members of this wing are tasked with **detecting and deporting illegal foreigners**, patrolling the India-Bangladesh border with the **Border Security Force**, maintaining a **second line of defense**.
- It also refers **people of suspicious citizenship to the FTs**.
- Cases of **'D' or doubtful voters** can also be referred to an FT by the **Election Commission of India**.

#### Citizenship (Amendment) Act, 2019:

- The **CAA, 2019** provides a path to Indian citizenship for migrants belonging to **six religious minorities: Hindu, Sikh, Buddhist, Jain, Parsi, and Christian from Pakistan, Bangladesh, and Afghanistan**.

The application process for citizenship under CAA has been made under **Section 6B of the Citizenship Act, 1955**

#### 7th apex level meeting of Narco-Coordination Centre (NCORD)

**Subject: polity**

**Sec: National body**

#### Context:

**Union Home Minister Amit Shah** called for **ruthless action against drug smuggling syndicates** stating that police and other agencies should not only aim to arrest those who **consume narcotics**.

#### More about News:

- The **Minister launched a toll-free helpline** called **MANAS (Madak Padarth Nishedh Asuchna Kendra)** at 1933.
- All agencies should **move from 'Need to Know' policy** to that of **'Duty to Share'**. There should be a **ruthless approach towards supply of drugs**, a strategic approach towards **demand reduction and a humane approach towards harm reduction**.

#### MANAS (Madak Padarth Nishedh Asuchna Kendra):

- **Toll-free number 1933, a web portal, a mobile app and UMANG app** so that citizens of the country can **anonymously connect with NCB 24x7** for seeking advice on **de-addiction and rehabilitation, sharing information on drug trafficking**.

#### Narcotics Control Bureau (NCB):

- **Headquarters: Delhi**
- **Ministry: Ministry of Home Affairs (MHA)**

- **Statutory body**
- Constituted by the Government of India in 1986 under the **Narcotic Drugs and Psychotropic Substances Act, 1985**.
- **NCB now has 30 zonal offices and 7 regional offices.**

**Major challenges posed by synthetic drugs:**

- **Entire business** of such substances is **getting linked with terrorism and the money coming from drugs** has emerged as the most serious **threat to the security of the country**.
- **Economic transactions** meant to **weaken the economy** have also been
- **Illegal hawala dealings and tax evasion.**
- **Foreign countries** have **decriminalised drugs-related offences** as they **do not have enough space in jails**, it is **not due to any humanitarian approach**.
- **Maritime routes** were being **used for smuggling drugs**.

**Action against drugs:**

- To increase the usage of the **Prevention of Illicit Traffic in Narcotic Drugs and Psychotropic Substances Act (PITNDPS)**.
- **Harsh laws** are made to **fight organised crimes**.
- **Strategy for coastal and land-locked areas** should be unique.

**Govt. of India has adopted two-pronged strategy to achieve**

**The vision of “Nasha Mukh Bharat”:-**

- **Drugs supply reduction initiatives.**
- **Drugs demand reduction initiatives.**

**Drugs supply reduction initiatives taken by the Government are as detailed below:**

(i) **Narco Coordination Centre (NCORD)** - The Government has introduced the **NCORD mechanism in 2016** to have effective coordination of actions among various **Ministries, Departments, Central and States law enforcement agencies** dealing with **narcotics**. The mechanism was **restructured in 2019 into a 4 tier structure** as detailed under:-

- **Apex Level Committee (headed by Union Home Secretary)**
- **Executive Level Committee (headed by Special Secretary (IS),**

**MHA).**

- **State Level Committee (headed by Chief Secretary of the concerned State).**
- **District Level Committee (Headed by District Magistrate)**

(ii) A **Joint Coordination Committee (JCC)** was constituted vide MHA's consisting of **Central and State Agencies to monitor investigations in case of large seizure of drugs**.

(iii) A **special Task Force on Dark net and Crypto currency** has been constituted to **monitor suspicious transactions related to drugs on Darknet**.

(iv) To **prevent smuggling along border areas** various **border guarding forces like BSF, SSB and Assam Rifles** have been empowered under **Narcotics Drugs and Psychotropic Substance (NDPS) Act, 1985** to make **interdiction of drugs**.

(v) To mitigate the problem of **drug trafficking through maritime route**, the **Indian Coast Guard (ICG)** has been empowered under the **Narcotics Drugs and Psychotropic Substances (NDPS) Act** for making **interdiction of narcotic drugs at sea**.

(vi) Since **illicit trafficking of narcotic drugs and its abuse is a trans-national problem**, Govt. of India has entered into **bilateral agreements with 27 countries**, Memorandum of Understanding

**(B) Initiatives taken by the Government for Drugs demand reduction are as follow :**

(i) **National Action Plan for Drug Demand Reduction (NAPDDR)** is an umbrella scheme of **Ministry of Social Justice & Empowerment (MoSJ&E)** under which **financial assistance is provided to State Governments/ Union Territory (UT) Administrations for Preventive Education and Awareness Generation**, Capacity Building, Skill development, vocational training and livelihood support to ex-drug addicts, Programmes for Drug Demand Reduction by States/UTs and Non-Governmental Organizations/ **Voluntary Organizations for running and maintenance of Integrated Rehabilitation Centers for Addicts (IRCA)s**, **Community based Peer Led Interventions (CPLI) for early Drug Use Prevention among Adolescents**, **Outreach and Drop In Centers (ODIC) and Addiction treatment facilities (ATFs) in Government Hospitals**.

(ii) Launching of **Nasha Mukh Bharat Abhiyan (NMBA) in 372 most vulnerable districts** with a **massive community outreach programme**, involving more than 8000 youth volunteers.

(iii) The **Ministry of Social Justice and Empowerment** is also running a **National Toll Free Helpline 14446** to provide **tele-counseling to drug users** and refer them to the nearest de-addiction center.

(iv) NCB has also launched **awareness campaigns** through various social media platforms by way of **Audio Video messages of eminent personalities** from the field of **Politics, Bureaucracy, Sports, Films, Music etc.** and also through **Telecom Service Providers, FM Radios, Television Channels, etc.**

#### **Prevention of Illicit Traffic in Narcotic Drugs and Psychotropic Substances Act (PITNDPS):**

- **Section 3** of the **Prevention of Illicit Traffic in Narcotics Drugs and Psychotropic Substances Act, 1988** empowers the government to **detain a person to prevent him from engaging in illicit traffic in narcotic drugs and psychotropic substances.**

### **Government has ‘usurped’ UGC’s autonomy by curbing financial powers**

**Subject: Polity**

**Sec: National Body**

**Context:**

Narendra Modi government for **interfering with the autonomy of the University Grants Commission (UGC) by “usurping” its power to sanction funds for higher education.**

**More on News:**

- **UGC’s functioning of ‘Granting’ funds has been usurped by Higher Education Financing Agency (HEFA) — a venture between Canara Bank and the Ministry of Education.**
- **This will not only compel colleges and universities to introduce more self-financing courses but also increase the financial woes of SC, ST, OBC and EWS students.**
- **The budget for higher education has been slashed by ₹9,600 crore. Similarly, the budget for IITs and IIMs have been cut for the second consecutive year.**
- **The UGC is a statutory body, and was supposed to be the only grant-giving agency in the country, but has snatched its power, thereby trampling upon its autonomy!**

**University Grants Commission (UGC):**

- **Founder: Maulana Azad**
- **Headquarters: New Delhi**
- **University Grants Commission is a statutory body under Department of Higher Education, Ministry of Education, Government of India.**
- **It was set up in accordance to the UGC Act 1956.**
- **It has six regional centre in Pune, Bhopal, Kolkata, Hyderabad, Guwahati and Bangalore.**
- **A proposal to replace it with another new regulatory body called HECI is under consideration by the Government of India.**
- **The UGC provides doctoral scholarships to all those who clear JRF in the National Eligibility Test.**

**Higher Education Financing Agency (HEFA):**

- **HEFA was founded in May 2017, and is a joint venture between the Union Ministry of Education and Canara Bank, with agreed-upon equity participation in the ratios of 91% and 09.09%, respectively.**
- **As a non-deposit-taking NBFC and as a Union Government entity. Under the Companies Act of 2013, HEFA is registered with the RBI**

**Vision:**

- **To enable India’s premier educational institutions to excel and reach the top in global rankings by financing building world class infrastructure including R&D Infra.**

**Responsibilities:**

- **To finance the demand, it will mobilise market resources in the form of equity from people and corporations, as well as the issuing of bonds.**
- **It offers financial help for the development of educational facilities and research and development in India's best educational institutions.**
- **Encourages scientific and technical advancements by providing funding for R&D facilities to perform high-quality research.**
- **Channel corporate social responsibility (CSR) contributions and donations for different initiatives aimed at improving higher education.**

## The Ministry of Statistics and Programme Implementation (MoSPI) Launches eSankhyiki Portal for Enhanced User Experience and Ease of Data Access

**Sub: Polity**

**Sec: Msc**

**eSankhyiki Portal:**

- Launched by: **Ministry of Statistics and Programme Implementation (MoSPI)**
- Developed to provide **real-time data** for **planners, policymakers, researchers, and the public**.
- **Aims** to establish a **comprehensive data management and sharing system** for **official statistics in India**.
- Officially launched on **June 29, 2024**, by **Dr. Arvind Panagariya, Chairman of the 16th Finance Commission of India**, during **Statistics Day**.
- The portal can be accessed through the website of MoSPI or directly at [eSankhyiki Portal](#).

**Modules of the eSankhyiki Portal:**

### 1. **Data Catalogue Module:**

- Catalogues major data assets of the Ministry for easy access.
- Allows users to search within datasets and download data.
- **Includes seven data products:**
  - National Accounts Statistics
  - Consumer Price Index
  - Index of Industrial Production
  - Annual Survey of Industries
  - Periodic Labour Force Survey
  - Household Consumption Expenditure Survey
  - Multiple Indicator Survey
- Contains over **2291 datasets** with **metadata** and

### 2. **Macro Indicators Module:**

- Provides time series data of key macro indicators with filtering and visualization features.
- Allows users to download custom datasets and share visualizations via APIs.
- **Initially includes four major products of MoSPI:**
  - National Accounts Statistics
  - Consumer Price Index
  - Index of Industrial Production
  - Annual Survey of Industries
- Hosts more than **7 million records** covering the past **ten years**.

**Significance:**

- Supports the theme of **Statistics Day: "Use of data for Decision making."**
- Facilitates **ease of data access** for **evidence-based decision-making**.
- Promotes the use and reuse of information for impactful analysis and value addition by users.

**Ministry of Statistics and Programme Implementation (MoSPI):**

- The Ministry is responsible for the integrated development of the **national statistical system** in India.
- **Aims** to align with global statistical practices and data dissemination standards.
- Focuses on enhancing user experience and data accessibility using advanced technologies and best practices.

## General Upendra Dwivedi assumes charge as 30th Indian Army chief

**Sub: Polity**

**Sec: Msc**

**Context:**

- **General Upendra Dwivedi** took over as the 30th Chief of the Army Staff (COAS) of the 1.3 million Indian Army on June 30 from General Manoj Pande who superannuated after more than four decades of service.

**About Chief of the Army Staff (COAS):**

- **The Chief of the Army Staff (COAS) is a statutory office** held by the professional head of the Indian Army (IA), the land forces branch of the Indian Armed Forces.

- Customarily held by a four-star general officer, the COAS is the senior-most operational officer of the Indian Army.
- COAS is tasked with the **roles of overseeing the overall functioning** of the force during peace and wartime, committing to the preparation and maintenance of the force's operational effectiveness and defending the nation's territorial integrity and sovereignty.
- Also a **permanent member of the Chiefs of Staff Committee (COSC)** and the **National Security Council (NSC)**, the COAS also bears the responsibility of advising the nation's civilian leadership i.e., the Government of India on all matters privy to the IA.
- Statutorily, **the COAS ranks 12th-overall in the Indian order of precedence**, and is the IA's status-equivalent of the Chief of Defence Staff, the Chief of the Naval Staff and the Chief of the Air Staff - all three positions of which are also occupied by four-star officers from the armed forces.

## President confers Gallantry awards to armed forces, police personnel

### Sub: Polity

#### Sec: Msc

President Draupadi Murmu conferred gallantry awards, including the Kirti Chakras and Shaurya Chakras to the personnel of the armed forces, the Central Armed Police Forces (CRPF), and state/Union Territory police during a Defence Investiture Ceremony (Phase-I) held at the Rashtrapati Bhawan on Friday.

#### Historical Background:

- Three gallantry awards, namely **Param Vir Chakra, Maha Vir Chakra and Vir Chakra**, were instituted by the Government of India on **26th January, 1950**.
- Thereafter, the other three gallantry awards, i.e. **the Ashoka Chakra Class-I, the Ashoka Chakra Class-II and the Ashoka Chakra Class-III** were instituted in These awards were renamed **Ashoka Chakra, Kirti Chakra and Shaurya Chakra**, respectively, in 1967. The order of precedence of these awards is the **Param Vir Chakra, the Ashoka Chakra, the Mahavir Chakra, the Kirti Chakra, the Vir Chakra, and the Shaurya Chakra**.
- All the gallantry awards may be awarded posthumously.
- Persons recommended for the award shall not be involved in any adverse report or should not have been conveyed any displeasure or censure or given any punishment in a court martial proceeding or through administrative action.

#### Param Vir Chakra

- **Highest military decoration** in India.
- Awarded for the **most conspicuous bravery or some daring or pre-eminent act of courage or self-sacrifice**, in the presence of the enemy, whether on land, at sea, or in the air.
- Established on 26th January 1950 (retrospectively from 15th August 1947).
- **Medal:** Circular in shape, made of bronze, one and three eighth inches in diameter, and shall have embossed on the obverse four replicas of "Indra's Vajra" with the State Emblem embossed in the center. On its reverse, it shall have embossed "PARAM VIR CHAKRA" in Hindi and English with two lotus flowers between the Hindi and the English inscriptions.
- **Ribbon:** Plain purple colored ribbon.
- **Bar:** If any recipient of the Chakra again performs such an act of bravery, as makes him or her eligible to receive the Chakra, such further act of bravery shall be recorded by a Bar to be attached to the riband by which the Chakra is suspended. For every Bar awarded, a replica of the "Indra's Vajra" in miniature shall be added to the riband when worn alone.

#### Mahavir Chakra

- Second highest military decoration in India.
- Awarded for **acts of conspicuous gallantry in the presence of the enemy**, whether on land, at sea, or in the air.
- It is the peacetime equivalent of the PVC.
- **Medal:** Circular in shape is made of standard silver, and is embossed on the obverse a five-pointed heraldic star with the points of the star just touching the rim. The medal shall be one and three-eighth inches in diameter. The State emblem (including the motto) is embossed in the center-piece which is adorned. The star is polished and the centre piece is in gold gilt. On the reverse, it will have embossed Maha Vir Chakra both in Hindi and English with two lotus flowers between Hindi and English. The fitting is swivel mounting.
- **Ribbon:** The ribbon is of a half-white and half-orange color.
- **Bar:** If any recipient of the Chakra again performs such an act of bravery, as makes him or her eligible to receive the Chakra, such further act of bravery will be recorded by a Bar to be attached to the riband by which the chakra is suspended. For every Bar awarded, a replica of the Chakra in miniature shall be added to the riband when worn alone.

#### Vir Chakra



- Third in precedence among wartime gallantry awards.
- Awarded for **acts of gallantry in the presence of the enemy**, whether on land, at sea, or in the air.
- **Medal:** Circular in shape is made of standard silver, and is embossed on the obverse a five-pointed heraldic star with the points of the star just touching the rim. The State Emblem (including the motto) is embossed in the domed centerpiece. The star is polished and the centre piece is in gold gilt. On the reverse, it will have embossed Vir Chakra both in Hindi and English with two lotus flowers between Hindi and English wording. The fitting is swivel mounting.
- **Ribbon:** The ribbon is half blue and half orange in color.
- **Bar:** If any recipient of the Chakra again performs such an act of bravery, as makes him or her eligible to receive the Chakra, such further act of bravery will be recorded by a Bar to be attached to the riband by which the Chakra is suspended. Any such Bar or Bars may also be awarded posthumously. For every Bar awarded, a replica of the Chakra in miniature shall be added to the riband when worn alone.

#### Peacetime gallantry awards

##### Ashoka Chakra

- **The highest peacetime gallantry award** is equivalent to the PVC but awarded for valor, courageous action, or self-sacrifice away from the battlefield.
- It can be awarded to both military and civilians, including posthumous awards.
- **Medal:** Circular in shape, one and three-eighth inches in diameter with rims on both sides and will be of gold gilt. On the obverse, it shall have embossed a replica of Ashoka's Chakra in the center surrounded by a lotus wreath. On its reverse shall be embossed the words "Ashoka Chakra" in Hindi and English, the two versions being separated by two lotus flowers.
- **Ribbon:** Green color ribbon divided into two equal segments by an orange vertical line.
- **Bar:** If a recipient of the Chakra again performs such an act of gallantry as would have made him or her eligible to receive the Chakra, such further act of gallantry shall be recognized by a Bar to be attached to the riband by which the Chakra is suspended and, for every subsequent act of gallantry, an additional Bar shall be added. For every such Bar, a replica of the Chakra in miniature shall be added to the riband when worn alone.

##### Kirti Chakra

- Second in order of precedence of peacetime gallantry awards.
- Awarded for conspicuous gallantry otherwise than in the face of the enemy.
- **Medal:** Circular in shape and made of standard silver, one and three eight inches in diameter. On the obverse of the medal shall be embossed a replica of Ashoka Chakra in the center, surrounded by a lotus wreath. On its reverse shall be embossed the words KIRTI CHAKRA both in Hindi and in English the versions being separated by two lotus flowers.
- **Ribbon:** Green color ribbon divided into three equal parts by two orange vertical lines.
- **Bar:** If a recipient of the Chakra again performs such an act of gallantry as would have made him or her eligible to receive the Chakra, such further act of bravery shall be recognized by a Bar to be attached to the riband by which the Chakra is suspended. For every Bar awarded, a replica of the Chakra in miniature shall be added to the riband when worn alone.

##### Shaurya Chakra

- Third in order of precedence of peacetime gallantry awards.
- Awarded for gallantry otherwise than in the face of the enemy.
- **Medal:** Circular in shape and of bronze, one and three-eighth inches in diameter. On the obverse of the medal shall have embossed a replica of Ashoka Chakra in the center, surrounded by a lotus wreath. On its reverse shall be embossed the words "SHAURYA CHAKRA" both in Hindi and English, the two versions being separated by two lotus flowers.
- **Ribbon:** Green color ribbon divided into four equal parts by three vertical lines.
- **Bar:** If any recipient of the Chakra again performs such an act of gallantry as makes him or her eligible to receive the Chakra, such further act of gallantry will be recorded by a Bar to be attached to the riband by which the Chakra is suspended. For every Bar awarded, a replica of the Chakra in miniature shall be added to the riband when worn alone.

##### Other Gallantry Awards

- **Sena Medal, Nao Sena Medal, and Vayusena Medal:** Awarded to members of the Indian army, navy, and air force respectively for devotion to duty or courage as part of military operations.
- **Sarvottam Yudh Seva Medal:** Medal and Ribbon Instituted in 1980 to recognize the distinguished service of the most exceptional order during war/conflict/hostilities.
- **Uttam Yudh Seva Medal:** Medal and Ribbon Instituted in 1980 to recognize the distinguished service of an exceptional order during war/conflict/hostilities.

- **Yuddh Seva Medal:** Medal and Ribbon Instituted in 1980 to recognize distinguished service of a high order during war/conflict/hostilities.
- **Param Vishisht Seva Medal:** Medal and Ribbon Instituted in 1960 as VSM Class-I to recognize the distinguished service of the most exceptional order.
- **Ati Vishisht Seva Medal:** Medal and Ribbon Instituted in 1960 as VSM Class-II for distinguished Service of an exceptional order.
- **Vishisht Seva Medal:** Medal and Ribbon Instituted in 1960 and as VSM Class-III to recognize the distinguished service of a high order.
- **Mention in Dispatches:** Recognizes distinguished and meritorious service in operational areas and combat zones that are not of a sufficiently high order to warrant the grant of gallantry awards.

#### **Eligibility and Procedure**

The Ministry of Defence invites recommendations twice in a year from the Armed Forces and Union Ministry of Home Affairs for gallantry awards.

- Personnel from all branches of the Indian armed forces, paramilitary forces, and civilians are eligible for these awards.
- The awards are typically announced biannually – on Republic Day (26th January) and Independence Day (15th August).
- The selection process involves recommendations from the chain of command, with final approval by the Awards Committee, headed by the Defence Minister and ratified by the President of India.

### **International Centre for Audit of Local Governance, which the CAG inaugurated in Gujarat**

**Subject: Polity**

**Sec: Local Govt, PRI**

**Context:**

**Comptroller and Auditor General (CAG) of India** Girish Chandra Murmu inaugurated the **International Centre for Audit of Local Governance (iCAL) in Rajkot.**

**More about News:**

- The institute, a **first in the country as per the CAG office**, will function out of the office building of the **Accountant General (account & entitlement and Audit-1) in Rajkot.**

**Comptroller and Auditor General (CAG):**

**Founded:** 1858

**Abbreviation:** CAG

**Deputy:** Deputy Comptrollers and Auditors General of India

**Appointed by:** President of India

**Headquarters:** New Delhi, Delhi

**Department:** Indian Audit and Accounts Department (IAAD)

**Aim:**

- To set **global standards for auditing local governance bodies.**

**How will iCAL work?**

- iCAL will be a **collaborative platform for policymakers, administrators and auditors linked with local governments.**
- It will **enhance the local government auditors independence to ensure improved financial performance assessment, service delivery, and data reporting.**
- It will also serve as a **centre of excellence for capacity building of local government auditors.**

**Primary aim :**

- To effectively **fulfil their roles through training and leadership development initiatives.**
  - **Empower auditors**
  - **Executives**
  - **Elected representatives of local governments.**

**Three-tier governance structure:**

- India has a **three-tier governance structure** comprising the **Union or Central government, state governments, and local bodies at urban and rural levels.**

- **Panchayati Raj Institutes (PRIs)** like **village panchayats, taluka (block) panchayats and district panchayats** have been set up for **self-governance in rural areas**, with **Urban Local Bodies** such as **municipal corporations and municipalities in urban areas**.

#### How are local bodies audited in India?

- The concerned local body, many state governments have an **Examiner of Local Fund Accounts (ELFA) or Director of Local Fund Accounts (DLFA) for auditing their accounts**.
- ELFA is an autonomous office functioning under the aegis of the finance department.
- **ELFA audits the utilisation of funds granted by the state government to local bodies.**
- The **CAG**, conducts **audits of all funds (including the state and Central governments)**.
- It also **exercises control and supervision over the proper maintenance of accounts and auditing for all three levels of PRIs/ULBs.**

#### Why was a need felt for it?

- A lot of **funds are flowing to local bodies** now and there is a **need for proper auditing of these institutions**, there have long been concerns about the **lack of funding available to local bodies**, and its utilisation.
- A **2022 report from the Reserve Bank of India (RBI)** found, **Most municipalities only prepare budgets and review actuals against budgeted plans but do not use their audited financial statements for balance sheet and cash flow management, resulting in significant inefficiencies.**

#### UPSC chairman Manoj Soni resigns citing 'personal reasons'

##### Subject: Polity

Sec: Msc

##### Context:

Manoj Soni, chairman of UPSC, has resigned for personal reasons before his term ends in May 2029. Soni now wants to focus on "socio-religious activities".

##### More about News:

- His resignation is **"not in any way connected to controversies and allegations surrounding the Union Public Service Commission (UPSC)"**
- **At the time of joining the MSU**, Soni was the youngest ever Vice-Chancellor in India.
- A **scholar of political science with specialisation in international relations**, Soni taught **international relations at Sardar Patel University (SPU), Vallabh Vidyanagar between 1991 and 2016**, except for the period when he served as **Vice-Chancellor of the two universities.** UPSC is headed by a chairman and can have a maximum of ten members. At present, there are seven members in the UPSC, three less than its sanctioned strength.

##### Public Service Commissions:

- **Article 312** of the Indian Constitution, the **Parliament is entitled to create one or more All India services** (including an **All India Judicial Service**) common to the Union and the States. The recruitment to all these services is made by the **Union Public Service Commission (UPSC)**.
- **Union Public Service Commission (UPSC)** is the **central recruiting agency** in India. It is an **independent constitutional body**. The provisions regarding the composition of UPSC, **appointment and removal of its members and the powers and functions of UPSC** are provided in **Part XIV** of the Indian Constitution under **Article 315 to Article 323**.

##### Constitutional Provisions:

- **Article 315:** Constitution of Public Service Commissions (PSC) for the Union and for the States of India.
- **Article 316:** Appointment and term of office of members of UPSC as well as SPSC.
- **Article 317:** Removal and suspension of a member of both the UPSC or SPSC.

##### Composition of Union Public Service Commission:

- **Appointment of Members:** The **Chairman and other members of the UPSC are appointed by the President of India.**
- **Term of Office:** Any member of the UPSC shall hold office for a **term of six years** or till the age of **65 years**, whichever is earlier.
- **Reappointment:** Any person who has once held the office as a member of a Public Service Commission is **ineligible for reappointment to that office.**
- **Resignation:** A member of the Union Public Service Commission may resign from his/her office by **submitting the written resignation to the President of India.**

- **Removal/Suspension of Members:** The Chairman or any other member of UPSC shall **only be removed from his/her office by order of the President of India.**
- The President can suspend the Chairman or any other member from his/her office in respect of whom a reference has been made to the Supreme Court.
- **Conditions for Removal:** The Chairman or any other member of UPSC may be removed if he/she:
  - is adjudged an insolvent.
  - engages during his/her term of office in any paid employment outside the duties of his/her office.
  - is, in the opinion of the President, unfit to continue in office by reason of infirmity of mind or body.
- **Restriction of Power:** The conditions of service of a member of UPSC shall not be amended after his/her appointment that may lead to his/her disadvantage.

## Bhil tribe have demanded a separate Bhil Pradesh

**Subject: Polity**

**Sec: Msc**

**Context:**

A large number of people from the Bhil tribe recently gathered at a rally in Rajasthan's Mangarh Dham, where Banswara's Member of Parliament Rajkumar Roat again raised the "long due" demand for an independent 'Bhil state'.

**More about News:**

- "In a democracy, there is freedom of expression. Every person has a right to demand, and there should be smaller states as it is good for development. However, creating a state on the basis of caste is not apt. If it is Adivasis today, tomorrow you will have other communities demanding the same on the basis of their caste, which is not good for the society and the country, while we talk of social harmony."
- The idea of a tribal state, comprising parts of Rajasthan, Madhya Pradesh, Gujarat and Maharashtra.

**Bhill Tribe:**

- Largest tribal groups, living in Chhattisgarh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Andhra Pradesh and Rajasthan.
- They speak **Bhili**, which is an Indo Aryan language.
- **Baneshwar fair** is the main festival celebrated among the **Bhils**. This fair is held during the **period of Shivratri (in the month of January or February)** and is dedicated to **Baneshwar Mahadev also known as Lord Shiva**.
- The name is derived from the word '**billu**', which means bow.
- **Excellent archers coupled with deep knowledge about their local geography.**
- Traditionally, experts in **guerrilla warfare**, most of them today are **farmers and agricultural labourers**. They are also skilled

**Bhil Pradesh:**

- The demand for a separate tribal state in western India was previously put forward by regional parties such as the Bharatiya Tribal Party (BTP). The BTP was formed in 2017 in Gujarat, with this issue as a major agenda.
- The Bhil community has been demanding that 49 districts be carved out of the four states to establish Bhil Pradesh.
- **Bhil social reformer and spiritual leader Govind Guru** first raised the demand for a separate state for tribals back in 1913.
- This was after the **Mangarh massacre**, which took place six years before **Jallianwalla Bagh** and is sometimes referred to as the "**Adivasi Jallianwala**". It saw hundreds of **Bhil tribals being killed by British forces on November 17, 1913, in the hills of Mangarh on the Rajasthan-Gujarat border.**

**Why do tribals want separate state?**

"According to the 2011 census, tribals comprise almost 14% of Rajasthan's population and are mainly concentrated in the Vagad region, comprising Pratapgarh, Banswara Dungarpur and parts of Udaipur districts.

**Constitutional Provisions:**

- Indian constitution empowers the Union government to create new states out of existing states or two merge one state with other. This process is called **reorganisation of the states**.
- The basis of reorganisation could be **linguistic, religious, ethnic or administrative**.
- **Article 3** spells out the modes/ways of formation of States in the country.
  - by separation of territory from any State
  - by uniting two or more States or parts of States or
  - by uniting any territory to a part of any State.

- **Article 3** provides the following procedure:
  - **Presidential reference is sent to State Assembly.**
  - **After presidential reference, a resolution is tabled and passed in Assembly.**
  - **Assembly has to pass a Bill creating the new State/States.**
  - **A separate Bill has to be ratified by Parliament.**

### HC quashes exemption from RTE quota for private schools

**Subject: Polity**

**Sec: Msc**

**Context:**

The Bombay High Court **quashed the Maharashtra government's recent notification** which had exempted private schools — located within one kilometre radius of a government or government-aided school — from providing a 25% quota for students belonging to “weaker section and disadvantaged group in the neighbourhood”.

**Right To Education (RTE):**

- The **Constitution (Eighty-sixth Amendment) Act, 2002** inserted **Article 21-A** in the Constitution of India to **provide free and compulsory education of all children in the age group of six to fourteen years as a Fundamental Right** in such a manner as the State may, by law, determine. **The Right of Children to Free and Compulsory Education (RTE) Act, 2009**, which represents the consequential legislation envisaged under **Article 21-A**, means that every child has a right to full time **elementary education of satisfactory and equitable quality** in a formal school which satisfies certain essential norms and standards. **Article 21-A and the RTE Act came into effect on 1 April 2010.**
- The quota comes under **Section 12(1)(C) of The Right Of Children To Free And Compulsory Education Act, 2009.** Students admitted under this quota are **given fee concessions, with the state government meant to reimburse private schools for the same.**

**What did the rule say?**

- The “**local authority shall not identify the private unaided school, for the purposes of 25% admission of disadvantaged group and weaker section under the Maharashtra Right of Children to Free and Compulsory Education Rules, 2013, where government schools and aided schools are situated within one-kilometre radius of that school.**”
- In Kerala, the **fee concession for students is only made available to RTE quota students if there are no government or aided schools “within walking distance”, which is one km for students joining Class 1.**

**Why have states introduced such exemptions?**

- In **Karnataka**, when the **rule was introduced in 2018**, the **primary intention of RTE is to provide education to all classes of students...** Till date, Karnataka has allowed parents to admit children to private schools despite having government schools in the **same neighbourhood. This has resulted in the enrollment ratio [in government schools] dropping drastically.**”
- According to **Section 12(2) of the RTE Act**, state governments are bound to **reimburse expenses incurred by the school per child, or the fee amount, whichever is less.**
- In Maharashtra, the **Maharashtra English School Trustees Association (MESTA) threatened to boycott RTE admissions last December citing pending payments of Rs 1,800 crore in reimbursements.**

**Why was the notification criticised?**

- **Section 12(1)(C) of the RTE Act that mandates 25% reservation of seats to children from disadvantaged backgrounds is in the direction of contesting the education apartheid in the country, and bringing parity and equality of opportunity for all children. Maharashtra government's amendment is unjustified. Bottom of Form**
- One of the **intentions of this law (the quota) was to enable students from marginalised backgrounds to get education in good schools.**

### Any further delay in Census taking is perilous

**Subject: Polity**

**Sec: Msc**

**Context:**

When the **Centre did not extend the deadline of June 30, 2024 to freeze administrative boundaries** for the purpose of the Census, hopes were **raised that the decennial Census operations, initially scheduled to begin in 2020 as a prelude to Census 2021**, would at least commence in October 2024.

**An absolute necessity:**

- Conducting the **Census on a priority basis is a must, as in the absence of a Census after 2011**, a majority of our country's population is **unable to access several schemes, benefits and services**.
- Moreover, the **implementation of the women's Reservation Act passed in the Parliament last year, reserving 33% of seats in Parliament and Assemblies for women**, awaits the conduct of the Census.
- It is imperative that sufficient provisions are made in the **2025-26 Census Budget** so that the 2021 Census that has been **postponed could be held at the earliest, in 2026**, on completion of the **first phase in 2025** that would include house listing and housing census and updating of the **National Population Register (NPR)**.
- The preliminary arrangements for the Census, such as **preparing updated maps and lists of administrative areas, pre-testing draft Census questionnaires, training of officers and core staff**, who would train the large number of field staff in **collecting the Census data digitally, i.e., on mobile app, planning the field work, logistics, budgeting** have all been taking place in the **Census Directorates in States and Union Territories** for the past few years in anticipation of putting through a Census.
- The **Constitution (Eighty fourth Amendment) Act of 2001** was specifically made so as **not to have delimitation of the constituencies till the first Census conducted after 2026**.

#### Clarifications:

- To create a **comprehensive database of usual residents** in the country, the NPR with details of persons usually **residing in villages and towns and other rural and urban areas** was **first prepared in 2010 during the Houselisting and Housing Census phase of Census 2011**. It was updated in **2015 incorporating changes due to birth, death and migration**. This process was put through under the **Citizenship Act, 1955**.

#### Delimitation:

- Delimitation means the **process of fixing the number of seats and boundaries** of territorial constituencies in each State for the **Lok Sabha and Legislative assemblies**.
  - It also includes determining the seats to be **reserved for Scheduled Castes (SC) and Scheduled Tribes (ST)** in these houses.
- This 'delimitation process' is performed by the **"Delimitation Commission"** that is set up under an act of Parliament.
  - Delimitation Commissions have been set up four times — **1952, 1963, 1973 and 2002** under the **Acts of 1952, 1962, 1972 and 2002**.
    - **The first delimitation exercise was carried out by the President (with the help of the Election Commission) in 1950-51.**
- The **84<sup>th</sup> Amendment Act of 2001** empowered the government to **undertake readjustment** and rationalisation of territorial constituencies in the states on the basis of the population figures of 1991 census.

#### National Population Register:

- NPR is a database **containing a list of all usual residents** of the country.
  - A usual resident for the **purposes of NPR is a person who has resided in a place for six months or more and intends to reside there for another six months or more**.
- Its objective is to **have a comprehensive identity database** of people residing in the country.
  - It is generated through **house-to-house enumeration during the "house-listing" phase of the Census**.
- **NPR was first collected in 2010**. It was **updated in 2015** and already has details of 119 crore residents.
  - **In March 2020, the Ministry of Home Affairs (MHA) amended the Census Rules framed in 1990 to capture and store the Census data in an electronic form and enabled self-enumeration by respondents.**

#### NRC in Manipur

**Sub: Polity**

**Sec: Constitution**

**Context:** Recently the Kuki community of Manipur welcomed the Implementation of NRC if done **under strict supervision of the Supreme Court**.

- Previously the **Meitei and Naga** organisations have been **demanding the implementation of the National Register of Citizens** to check infiltration from Myanmar

#### About National Register of Citizens (NRC)

- **Definition and Historical Context**
  - Origin: Prepared after the Census of 1951 in Assam to document residents.
  - Scope: Initially housed with Deputy Commissioners and later transferred to Police in the 1960s.
  - Directive: Issued under the Ministry of Home Affairs (MHA).
- **Implementation in Assam**



- Purpose: Identify Indian citizens amidst migration from East Pakistan (now Bangladesh).
- Scope: Currently exists only in Assam but may extend to other states.
- Similar Efforts: Nagaland creating the Register of Indigenous Inhabitants.
- **Updating the NRC**
  - Provisions and Eligibility
  - Legal Basis: Updated under The Citizenship Act, 1955 and The Citizenship Rules, 2003.
- **Inclusion Criteria:**
  - Persons listed in NRC, 1951.
  - Those in Electoral Rolls up to March 24, 1971.
  - Descendants of eligible persons.
  - Migrants from Bangladesh registered between January 1966 and March 1971.
  - Indian Citizens who moved to Assam post March 24, 1971, with proof of residence.
- **Need for the NRC**
  - Identifying Infiltrators: Aims to identify and deport illegal immigrants living in India.
  - Target: Primarily focuses on immigrants from countries other than Pakistan, Afghanistan, and Bangladesh.
  - Exclusions: Certain religious minorities from these countries are exempt under the Citizenship Amendment Act (CAA).
- **Relationship with Citizenship Amendment Act (CAA)**
  - No Direct Link: CAA and NRC are separate but related in immigration policy discourse.
  - CAA's Focus: Grants citizenship to persecuted minorities from Pakistan, Bangladesh, Afghanistan.
- **Conclusion**
  - **NRC's Role:** Essential for identifying Indian citizens and addressing concerns over illegal immigration.
  - **Controversies:** Surrounds potential nationwide implementation and its implications for various communities.

## Schemes

### ICAR to launch 'one scientist-one product' scheme today

#### Sub: Schemes

#### Sec: Agri

#### 'One Scientist-One Product' Programme:

- **Launched by:** The Indian Council of Agricultural Research (ICAR).
- **Aim:** To enhance research in agriculture and animal husbandry.
- The programme will be **inaugurated** by Union Agriculture Minister Shivraj Singh Chouhan.
- **Details:**
  - Each of the **5,521 scientists** at ICAR will be tasked with developing a **product, technology, model, concept, or publication**.
  - Progress will be **monitored every three months** at the **institute level** and **every six months** at the **headquarters level**, with a **five-year plan** in place.
  - This year, **seed hubs for high-yielding oilseeds and pulses** are a priority.
- **Additional Initiatives:**
  - ICAR aims to develop **100 new seed varieties** and **100 farm technologies within 100 days** as part of the Centre's action plan.

#### Release of Crop Varieties:

- ICAR will formally announce the release of **323 varieties** of **56 crops**, including **cereals, oilseeds, forage crops, and sugarcane**, on its **96th foundation day (16 July)**.
- These include **289 climate-resilient varieties** and **27 bio-fortified varieties**.

#### Impact and Achievements

- ICAR reported that **16 million hectares** are under **bio-fortified varieties of crops**, including **wheat, rice, pearl millet, lentil, and mustard** during **2023-24**.
- From **2014-15** to **2023-24**, ICAR released **2,593 high-yielding varieties**, including **2,177 climate-resilient** and **150 bio-fortified crop varieties**.

### About ICAR:

- Established on 16 July 1929 as a registered society under the Societies Registration Act, 1860.
- It is an **autonomous organisation** under the **Department of Agricultural Research and Education (DARE), Ministry of Agriculture and Farmers Welfare**, Government of India.
- **HQ- New Delhi.**
  - **102 ICAR institutes** and **71 agricultural universities** spread across the country this is **one of the largest national agricultural systems in the world.**

### What is Digital Bharat Nidhi, govt's fresh attempt at improving rural telecom connectivity?

#### Sub: Schemes

#### Sec: Computer

#### Digital Bharat Nidhi Draft Rules:

- The **Department of Telecommunications (DoT)** released **draft rules** for the **Digital Bharat Nidhi (DBN)**, replacing the **Universal Service Obligation Fund (USOF)**.
- **DBN** aims to **enhance telecom connectivity** in **rural areas** and has a **broader scope than USOF**.
- **DBN** will now **take over this role** with **updated rules and objectives**.
- **DBN** will also add to:
  - Research and development in telecommunication technologies.
  - Help with pilot projects and consulting services that will improve connectivity.
  - Telecommunications services that help underserved groups, like women and people with disabilities, should be financed.
  - Making the telecom sector more open to new ideas and technologies made in the country.

#### Digital Bharat Nidhi (DBN) Framework:

- **Funding Mechanism:**
  - **Telecom companies' contributions** to **DBN** will go to the **Consolidated Fund of India** and then transferred to **DBN**.
  - **Funds** will support **telecom services** in **underserved areas**, **R&D**, **pilot projects**, and **new technology introduction**.
- **Operational Structure:**
  - An **administrator** will be appointed to select **DBN implementers** through bidding or applications.
  - **Funding modalities** will include **full, partial, co-funding, market risk mitigation, and risk capital**.
- **Targeted Schemes and Projects:**
  - Focus on underserved groups like **women, persons with disabilities, and economically weaker sections**.
  - Promote **next-generation telecom technologies, improve affordability, encourage innovation, R&D, indigenous technology, and support start-ups in the telecom sector**.

#### About Universal Service Obligation Fund (USOF):

- Set up by an **Act of Parliament** in **December 2003** by amending the **Indian Telegraph Act, 1885**.
- **Objective:** To provide access to telecom services in a nondiscriminatory manner to people in rural and remote areas at affordable and reasonable prices, thereby bridging the rural-urban digital divide.
- For commercially non-viable rural and remote areas, USOF provides subsidy support in the form of **Net Cost or Viability Gap Funding (VGF)** to incentivize telecom service providers to expand telecommunications and broadband services in those areas.
- **Funding Mechanism:**
  - **USOF**, funded by a **5% levy** on **telecom operators' Adjusted Gross Revenue (AGR)**, supported **telecom network expansion in remote areas**.
- **Administration:**
  - **Headed** by the **Administrator, USO Fund** who is **appointed** by the **Central Government**, for the administration of the fund.
  - It is an **attached office** of the **Department of Telecommunications (DoT), Ministry of Communications**.

#### Underutilisation of USOF:

- Since **2003**, **USOF** faced criticism for underutilisation.
- From **2017-2022**, only **72%** of collected funds were used.
  - In **2019-20**, only **Rs 2,926 crore** of **Rs 7,962 crore** collected was utilized.

- **FY23** expenditure estimates were revised significantly lower due to underspending, particularly in the BharatNet project for village fibre connectivity.

## What is PM SHRI, the ‘showcase’ schools’ scheme that Centre is pushing in states?

### Sub: Schemes

#### Sec: Education

##### Context:

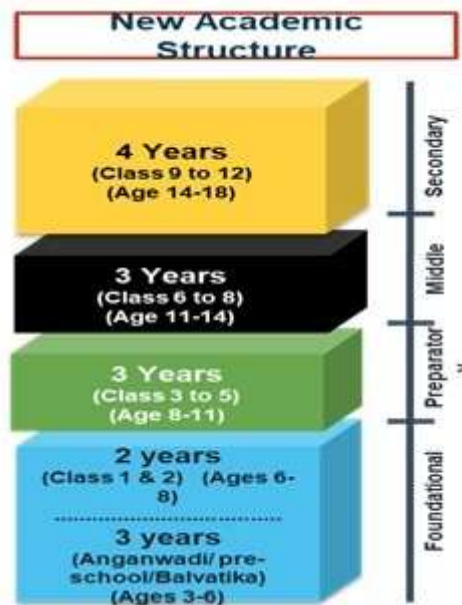
- The **Centre has stopped funding** for the umbrella program for school education in three opposition-ruled states that have refused to **implement its PM SHRI scheme**.
- The **Samagra Shiksha Scheme**, for which funding has been **stopped in West Bengal, Punjab, and Delhi**, supports implementation of the **Right of Children to Free and Compulsory Education (RTE) Act, 2009**.

#### What is Pradhan Mantri Schools for Rising India (PM-SHRI) Scheme?

- **PM SHRI** is a **Centrally Sponsored scheme** announced in 2022.
- It aims to develop **more than 14500 schools across the country** by strengthening selected existing schools being **managed by Central Government/ State/ UT Government/ local bodies**.
- It will create and **nurture holistic and well-rounded individuals** equipped with key 21st century skills.
- The **duration** of the scheme is from **2022-23 to 2026-27**, after which it shall be the **responsibility of the States/UTs to continue to maintain the benchmarks** achieved by these schools.
- **PM SHRI schools** will act as **exemplar schools** showcasing all components of the **National Education Policy 2020 (NEP)** and offering mentorship to other schools in their vicinity.
- The **PM SHRI Schools** will be developed as **Green Schools**, incorporating environment-friendly aspects.
- The focus will be on the **learning outcomes of every child in every grade**.
- **Assessment at all levels will be based on conceptual understanding** and application of knowledge to real-life situations and will be competency-based.
- **Linkage with Sector Skill Councils** and local industry for enhancing employability and providing better employment opportunities will be explored.
- A **School Quality Assessment Framework (SQAF) is being developed**, specifying the key performance indicators to measure outcomes. Quality evaluation of these schools at regular intervals will be undertaken to ensure the desired standards.
- These schools will provide leadership to other schools in their respective regions by providing mentorship.

#### What is the Samagra Shiksha Scheme?

- **Samagra Shiksha Abhiyan is an integrated scheme** for school education extending support to States from pre-school to **class XII**.
- The scheme not only provides support for the implementation of the **Right of Children to Free and Compulsory Education Act, 2009** but has also been aligned with the recommendations of **National Education Policy (NEP) 2020**.
- It aims to deliver **inclusive, equitable, and affordable school education**.
- It subsumes the **three Schemes of Sarva Shiksha Abhiyan (SSA), Rashtriya Madhyamik Shiksha Abhiyan (RMSA) and Teacher Education (TE)**.
- It is being implemented as a **centrally sponsored scheme**.
- To enhance the direct outreach of the scheme, **all child-centric interventions will be provided directly to the students through DBT mode** on an IT-based platform over a period of time.
- The scheme covers 1.16 million schools, over 156 million students and 5.7 million Teachers of Govt. and Aided schools (from pre-primary to senior secondary level) by **involving all stakeholders of the school ecosystem i.e. teachers, teacher educators, students, parents, community, school management committees, SCERTs, DIETs, BITEs, Block resource Persons, Cluster resource persons, volunteers for providing quality, inclusive and equitable education**.
- **Samagra Shiksha supports a new pedagogical and curricular structure of school education (5+3+3+4):3 years in Anganwadi/pre-school and 12 years in school**.



- The scheme has been extended for a period of five years i.e., from 2021-22 to 2025-26.

### The recommendations for equivalence across India's 69 school boards

**Subject: Schemes**

**Sec: Education**

**Context:**

In line with the National Education Policy (NEP) 2020, PARAKH, a standard-setting body under the NCERT, has submitted to the Ministry of Education an 'equivalence' report.

**More on News:**

- The NEP provides for the formation of a body like PARAKH, and states that PARAKH "will also become an instrument for the sharing of best practices among school boards, and for ensuring equivalence of academic standards among learners across all school boards."

**Equivalence across boards mean:**

- There are 69 school boards in the country, including the State boards – some are secondary boards only, some are for higher secondary, and some are common for both – and CBSE, ICSE, the National Institute of Open Schooling (NIOS) and other open school boards, technical and vocational boards, Sanskrit boards, and madrasa boards.
- The 'equivalence' report sets standards for the boards across five categories – administration, curriculum, assessment, inclusiveness, and infrastructure.
- The intention behind pursuing equivalence is not to establish "uniformity" across boards, but ensure that "every learner who enrolls in a school affiliated in any board should get certain standardised, benchmarked facilities for performance."

**Recommendations has PARAKH made:**

- In terms of assessment – a student's performance in Class 9, 10, and 11 will count towards the final assessment for Class 12.
- The Class 12 report card is envisaged as a 'cumulative' one, and a weight of 15% for Class 9, 20% for Class 10, 25% for Class 11, and 40% for Class 12 will go into the final Class 12 results.
- These assessments be in terms of credits in each grade, with the student earning a certain number of credits for each subject, for pursuing online courses, and for activities that are part of the holistic progress card.
- PARAKH has suggested that boards develop a cadre of 'professional paper setters' –teachers who will be trained to prepare question papers, to ensure standardisation in the assessments in classes 9, 10, 11 and 12.
- For standardisation of question papers, for classes 9 and 11, boards develop a question bank for all subjects offered.
- In terms of administration, PARAKH has suggested that the guidelines for school affiliation specified by the boards be finalised according to its recommendations.
- Boards develop a mechanism to prevent cheating in examinations, implement protocol for handling exam papers, and conduct digital assessments where applicable.
- In terms of curriculum, the boards are to incorporate digital literacy in affiliated schools, including training in coding and cybersecurity, and adhere to the National Curriculum Framework for School Education.

- In terms of **infrastructure** of the schools affiliated with them, the boards are to **ensure availability of basic infrastructure – toilets for girls and boys, internet, library, strong room for question papers, labs, ramps, or elevators.**

#### **PARAKH:**

- **PARAKH has been launched** as part of the implementation of the **National Education Policy (NEP) - 2020** that envisaged a **standard-setting body to advise school boards regarding new assessment patterns and latest research, and promote collaborations between them.**
- It will act as a **constituent unit of the NCERT.**
- It will also be tasked with **withholding periodic learning outcome tests like the National Achievement Survey (NAS) and State Achievement Surveys.**
- It will work on **three major assessment areas: large-scale assessments, school-based assessment, and examination reforms.**
- **Objective:**
  - **Uniform Norms & Guidelines: Setting norms, standards and guidelines** for student **assessment and evaluation** for all recognized school boards of India.
  - **Enhance Assessment Pattern:** It will **encourage and help school boards to shift their assessment patterns** towards meeting the **skill requirements of the 21st century.**
  - **Reduce Disparity in Evaluation:** It will bring **uniformity across the state and central boards** which currently follow different standards of evaluation, leading to wide disparities in scores.
  - **Benchmark Assessment:** The benchmark assessment framework will seek to put **an end to the emphasis on rote learning, as envisaged by the National Education Policy (NEP) 2020.**

#### **Educated mothers of young kids can help strengthen their learning journey**

##### **Subject: Schemes**

##### **Sec: Education**

##### **Context:**

The new **National Education Policy (NEP 2020)** was **launched on July 29**, four years ago. One of NEP 2020's key recommendations was to ensure that by the time children reach **Grade 3**, they have acquired **foundational literacy and numeracy skills.**

##### **More on News:**

- The Centre launched the **NIPUN (National Initiative for Proficiency in Reading with Understanding and Numeracy) Bharat Mission on July 5, 2021.**
- The mission has seen energetic implementation in many states, with a **new framework for the foundational stage of education developed and released well before frameworks for other stages.**
- This framework includes **teacher training oriented towards the new goals**, specially designed **teaching-learning materials** for use by children and teachers in **early grade classrooms, etc.**

##### **Two demographic trends**

- **School enrollment levels (between ages 6-14) have shown a remarkable rise in the last few decades.** With the launch of the **Sarva Shiksha Abhiyan in 2001**, school enrollment levels reached well above **90% in rural India by the early 2000s.**
- The data on education levels of mothers with children between ages 4 and 8 — the **target age of the NIPUN mission** — show a steep rise over the last decade.
- In states like **Uttarakhand, Maharashtra, Punjab, and Haryana, 30-40% of mothers** of young children have had schooling beyond **Grade 10.**
- In **Tamil Nadu this figure is close to 43%**, while in **Himachal, it is higher than 54%.** **Kerala tops this list with almost 72%** of these mothers receiving **high school education.**
- Due to the push **towards universal elementary education**, India today is in a unique **position to leverage young mothers' schooling levels** as a resource in their children's journey to **acquire foundational literacy and numeracy.**

##### **NIPUN (National Initiative for Proficiency in Reading with Understanding and Numeracy) Bharat Mission:**

- **Aims to cover the learning needs of children in the age group of 3 to 9 years.**
- **Part of NEP 2020:**
  - This initiative is being launched as a part of NEP (National Education Policy) 2020.
  - This policy aims to pave the way for **transformational reforms in school and higher education systems** in the country. This policy **replaced the 34-year-old National Policy on Education (NPE), 1986.**
- **Objective:**



- To create an enabling environment to ensure universal acquisition of foundational literacy and numeracy, so that every child achieves the desired learning competencies in reading, writing and numeracy by the end of Grade 3, by 2026-27.
- **Focus Areas:**
  - It will focus on providing access and retaining children in foundational years of schooling; teacher capacity building; development of high quality and diversified Student and Teacher Resources/Learning Materials; and tracking the progress of each child in achieving learning outcomes.
- **Implementation:**
  - NIPUN Bharat will be implemented by the Department of School Education and Literacy.
  - A five-tier implementation mechanism will be set up at the National- State- District- Block- School level in all States and UTs, under the aegis of the centrally sponsored scheme of Samagra Shiksha.
    - ‘Samagra Shiksha’ programme was launched subsuming three existing schemes: Sarva Shiksha Abhiyan (SSA), Rashtriya Madhyamik Shiksha Abhiyan (RMSA) and Teacher Education (TE).
    - The aim of the scheme is to treat school education holistically, from pre-school to Class XII.
  - A special package for foundational literacy and Numeracy (FLN) under NISHTHA (National Initiative for School Heads and Teachers Holistic Advancement) is being developed by NCERT.
    - Around 25 lakh teachers teaching at pre-primary to primary grade will be trained this year on FLN.
    - NISHTHA is a capacity building programme for "Improving Quality of School Education through Integrated Teacher Training".
  - Stage-wise targets are being set in a continuum from the pre-primary or balvatika classes.

### Credit guarantee cover extended to ₹7.5 lakh under revamped Model Skill Loan Scheme

**Subject: Schemes**

**Sec: Employment**

**Context:**

A similar scheme launched in 2015 saw low fund utilisation because individual loans were limited to ₹1.5 lakh, though high-end skilling courses cost much more; new scheme also expands lender network to NBFCs, small banks.

**More on News:**

- The Union Budget announcement hiking the eligible size of loans for high-end skilling courses under the Model Skill Loan scheme from ₹1.5 lakh to ₹7.5 lakh.
- The earlier Credit Guarantee Fund Scheme for Skill Development, notified in November 2015 to create a credit guarantee fund for courses aligned to the National Skill Qualification Framework, faced multiple challenges.
- Under the new scheme, the lending network has been broadened from only IBA banks to include Non Banking Financial Companies and small finance banks, with access to more skill courses and higher loan limits.

**Model Skill Loan Scheme:**

- It was introduced in July, 2015, to offer institutional credit to individuals pursuing skill development courses aligned with National Occupations Standards and Qualification Packs.
- These courses are conducted by training institutes following the National Skill Qualification Framework (NSQF) and lead to certifications, diplomas, or degrees.
- The Scheme applies to all member banks of the Indian Banks' Association (IBA) and other banks and financial institutions as advised by the Reserve Bank of India (RBI).
- **Features:**
  - **Eligibility:** Any Indian National who has secured admission in a course run by Industrial Training Institutes (ITIs), Polytechnics, or in a school recognised by Central or State Education Boards or in a college affiliated with a recognised university, training partners affiliated to National Skill Development Corporation (NSDC) Sector Skill Councils, State Skill Mission, or State Skill Corporation can avail loan for the purpose.
  - No specific restriction with regard to age.
  - Courses: Aligned with NSQF.
  - **Duration of Course:** No minimum duration.
  - **Quantum of Finance:** Rs. 5,000-1,50,000. Now, increased to Rs 7.5 lakh.
  - **Moratorium:** Duration of the course.
  - **Repayment Period:**



- **Loans up to Rs. 50,000: Up to 3 years.**
- **Loans between Rs. 50,000 to Rs. 1 lakh: Up to 5 years.**
- **Loans above Rs. 1 lakh: Up to 7 years.**
- **Coverage:** Course fees and expenses for assessment, examination, study material, etc.
- **Interest Rate:** The interest rate to be charged by the bank should **not be more than 1.5% p.a. over** and above **repo-linked-lending-rate (RLLR)** or any other external benchmark interest rate conforming to RBI guidelines.
- **Revised Skill Loan Scheme:**
  - **Loan Amount:** Increased to facilitate loans up to ₹7.5 lakh.
  - **Guarantee:** Backed by a guarantee from a government-promoted fund.
  - **Beneficiaries:** Expected to benefit 25,000 students annually.
- **Higher Education Loans for Underprivileged Students:**
  - **Loan Amount:** E-vouchers for loans up to ₹10 lakh for higher education in domestic institutions.
  - **Eligibility:** Targeted at students who do not qualify for existing schemes.
  - **Interest Subvention:** Annual interest subvention of 3% of the loan amount.
  - **Beneficiaries:** Directly benefit 100,000 students every year.
- **Budget Allocation for Education, Employment, and Skilling:**
  - **Total Allocation:** ₹1.48 trillion.
  - **Comparison:** Significant increase from the previous allocation of ₹1.2 trillion in the Interim Budget.

## NITI Aayog to launch ‘Sampoornata Abhiyan’

### Sub: Schemes

Sec: Msc

Context:

- **NITI Aayog** is launching ‘**Sampoornata Abhiyan**’, a 3-month campaign from 4th July – 30th September 2024, to undertake a sustained effort to achieve saturation of **6 key indicators in Aspirational Districts** and **6 key indicators in Aspirational Blocks** across the country.

More on news:

- NITI Aayog has provided a list of activities that districts and blocks can organize as part of the ‘**Sampoornata Abhiyan**’ launch.
- **NITI Aayog**, in collaboration with the relevant **Central Ministries and Departments**, as well as the Governments of States and Union Territories, will work together to ensure the effective and rapid development of these Districts and Blocks.

About Sampoornata Abhiyan-

‘**Sampoornata Abhiyan**’ will focus on the following **6 identified KPIs across all Aspirational Blocks:**

- **Percentage of pregnant women** registered for **Antenatal Care (ANC)** within the first trimester
- **Percentage of persons screened for Diabetes** against the targeted population in the Block
- **Percentage of persons screened for Hypertension** against the targeted population in the Block
- **Percentage of pregnant women** taking **Supplementary Nutrition** under the ICDS Programme regularly
- **Percentage of Soil Health Cards** generated against the soil sample collection target
- **Percentage of SHGs** that have received a **Revolving Fund** against the total SHGs in the block.

The **6 identified KPIs across Aspirational Districts under ‘Sampoornata Abhiyan’** are:

- **Percentage of pregnant women** registered for Antenatal Care (ANC) within the first trimester
- **Percentage of pregnant women** taking **Supplementary Nutrition** under the ICDS Programme regularly
- **Percentage of children fully immunized (9-11 months)** (BCG+DPT3+OPV3+Measles 1)
- Number of **Soil Health Cards** distributed
- **Percentage of schools** with **functional electricity** at the secondary level
- **Percentage of schools** providing **textbooks** to children within 1 month of the start of the academic session

About Aspirational Districts and Blocks Programme:

Aspirational Districts Programme	Aspirational Blocks Programme
----------------------------------	-------------------------------

<ul style="list-style-type: none"> <li>Launched in <b>January 2018</b> by Hon'ble Prime Minister.</li> </ul>	<ul style="list-style-type: none"> <li>Launched in <b>January 2023</b> by Hon'ble Prime Minister.</li> </ul>
<ul style="list-style-type: none"> <li>Aims to quickly and effectively transform <b>112 districts across the country.</b></li> </ul>	<ul style="list-style-type: none"> <li>Aims for saturation of essential government services in <b>500 Blocks (329 Districts) across the country.</b></li> </ul>
<ul style="list-style-type: none"> <li>Focuses on five themes: <ul style="list-style-type: none"> <li><b>Health &amp; Nutrition</b></li> <li><b>Education</b></li> <li><b>Agriculture &amp; Water Resources</b></li> <li><b>Financial Inclusion &amp; Skill Development</b></li> <li><b>Infrastructure</b></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Focuses on five themes: <ul style="list-style-type: none"> <li><b>Health &amp; Nutrition</b></li> <li><b>Education</b></li> <li><b>Agriculture and Allied Services</b></li> <li><b>Basic Infrastructure</b></li> <li><b>Social Development</b></li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>Progress is measured on <b>81 indicators of development</b></li> </ul>	<ul style="list-style-type: none"> <li>Progress is measured on <b>40 indicators of development</b></li> </ul>

## Include automobile firms in the Right to Repair Portal

### Sub: Schemes

#### Initiative Overview

- Purpose:** The Right to Repair Portal India aims to empower consumers by providing easier access to repair information for products, particularly focusing on automobiles.
- Meeting Focus:**
  - Participants:** Automobile associations and firms were invited to discuss participation in the portal.
  - Concerns Addressed:** Issues such as restricted access to repair tools, high service costs, and delays were highlighted.
- Chairperson:** The meeting was chaired by Department of Consumer Affairs (*DoCA*), who emphasized the **importance of democratizing repair manuals and fostering a supportive ecosystem for third-party repair services.**

#### Proposed Measures

- Democratization of Repair Information:**
  - Ensuring easier access to repair manuals and instructional videos for consumers.
- Repairability Index:**
  - Proposal to **introduce a "repairability index" for vehicles to inform consumers** about the lifespan of products and ease of repair.
- Circular Economy Contribution:**
  - The portal aims to contribute to a circular economy by enabling consumers to repair products, thus reducing waste and environmental impact.

#### Right to Repair Portal

- Access to Product Manuals:**
  - Manufacturers are required to share detailed product manuals on the portal. This empowers consumers to repair their products themselves or through third-party repair services, reducing dependency on original manufacturers.
- Covered Products:**
  - Initially, the portal will cover a wide range of products including mobile phones, electronics, consumer durables, automobiles, and farming equipment.
- Consumer Empowerment:**
  - It enables consumers to repair and modify their products without being compelled to use manufacturer-specific services. This includes access to tools, components, and software necessary for repairs.
- International Context:**
  - India joins countries like the US and the UK in providing such consumer rights, aligning with global practices that prioritize consumer choice and sustainability.
- Benefits:**
  - Cost Savings:** Consumers can save money by opting for repairs rather than replacements or expensive manufacturer services.

- **Circular Economy:** Enhances product lifespan, promotes maintenance, re-use, upgrades, recyclability, and improves waste management practices.
- **Government Initiative:**
  - The initiative is part of India's commitment to **promoting sustainable consumption and production patterns, aligning with global efforts towards a circular economy.**

## Science and tech

### Study finds gene mutation that turns familiar faces into strangers

**Sub: Science and tech**

**Sec: Biotech**

**Context:**

- According to research published in this month's issue of the journal Genetics, when MCTP2 gene is mutated the ability to recognise faces is severely impaired.

**More on news:**

- **Prosopagnosia, also called face blindness**, is a condition where you have difficulty recognising people's faces.
- Its prevalence worldwide is estimated to be **1.8-2.9% in the general population.**
- Prosopagnosia is one form of visual agnosia, or inability to identify everyday items just by looking at them.
- The MCTP2 gene is thus the first found to be required for a higher form of visual social cognition in humans.

**Face recognition and a gene:**

- By sequencing the **genomic DNA, the researchers found that the MCTP2 gene, located in this segment, had been altered by a mutation.**
- As a result, one amino acid in the protein encoded by the MCTP2 gene had been replaced by another.
- In the brain, the right middle fusiform gyrus, a.k.a. the fusiform face area (rFFA), is activated during facial recognition.
- When the researchers used functional magnetic resonance imaging to study individuals carrying the different MCTP2 mutations, they found abnormal responses in the rFFA.

**What is MCTP2 gene:**

- Multiple C2 domains, transmembrane 2 is a protein that in humans is encoded by the MCTP2 gene.
- MCTP2 encodes a protein with poorly understood roles in lipid metabolism and lipid droplet biogenesis.

### Cotton farmers struggle to deal with Scourge of the pink bollworm

**Subject: Sci**

**Sec: Biotech**

**Context:**

The deadly **pink bollworm** has ravaged cotton crops in the northern states of Punjab, Haryana, and Rajasthan. Cotton cultivation in these states has fallen from around 16 lakh hectares last year to only **10 lakh hectares this year.**

**More about News:**

- **PBW (Pink bollworm)** first appeared in North India during the 2017-18 season, in a few locations of Haryana and Punjab, primarily cultivating Bt cotton.
- **By 2021, the pest began to cause considerable damage in several districts in Punjab, including Bathinda, Mansa, and Muktsar. Since 2021, the frequency of PBW attacks in the three aforementioned states has increased annually.**
- Apart from Punjab, **affected districts in Rajasthan are Sri Ganganagar and Hanumangarh, and in Haryana, Sirsa, Hisar, Jind, and Fatehabad.**

**Pink Bollworm:**

- Scientific name: Pectinophora gossypiella
- The pink bollworm (PBW), known among farmers as gulabi sundhi, damages the cotton crop by burrowing its larvae into the cotton bolls. This results in the lint being cut and stained, making it unfit for use.
- Pink bollworm is native to Asia, but has become an invasive species in most of the world's cotton-growing regions.
- **In parts of India, the pink bollworm is now resistant to first generation transgenic Bt cotton (Bollgard cotton) that expresses a single Bt gene (Cry1Ac).**

**PBW Spread:**

- Spreads through

- **Residue of infected crops**, often left by farmers on the **field to be used as fuel**, can also harbour **PBW larvae** which can then infect future crops.
- **Infected cotton seeds.**

#### Controlling PBW spread:

- To prevent future infestation, fields which saw **PBW** infestation should not be planted with the cotton crop, for at least one season.
- Farmers have to **burn residue at the earliest, and ensure there is no mixing between healthy and unhealthy seeds (or cotton).**

#### Preventive measures:

- The “**gold standard**” of crop protection in the **West**, involves **the application of a certain paste onto the stems of cotton plants, near the shoots.** This paste releases **synthetic pheromones that attract male insects.**
- But **due to the widespread presence of these pheromones**, these **males are then unable to locate the females.** This **disrupts the mating process, and reduces PBW population.**
- For a **one-acre field with roughly 7,000 cotton plants**, the paste needs to be applied to **350-400 plants spread across the field, a total of three times — at the 45–50-day, 80 days, and 110-day marks after sowing.**
- **PBKnot Technology**, also works on a **similar principle.** Here, **thread knots with pheromone dispensers are placed strategically on the cotton fields to confuse male moths, and prevent them from finding females.** This dispenser has to be tied to cotton plants when they are **45-50 days old.**

#### Problems with adoption:

- Lack of awareness and training
- Costs
- Intensive training programs and awareness campaigns are necessary
- Expanded field demonstrations, and government and private sector support
- Coordinated effort among states where the pest has been wreaking havoc.

### Supreme Court delivers split verdict on nod for GM mustard

**Sub: Sci**

**Sec: Biotech**

#### Context:

- The **Supreme Court** issued a split verdict on the **Centre's 2022 decision to grant conditional approval for the environmental release of genetically modified (GM) mustard crops.**

#### Details:

- **Justices B.V. Nagarathna and Sanjay Karol** called for the **Centre to create a national policy on GM crops**, covering research, cultivation, trade, and commerce.
- On October 18, 2022, the **Genetic Engineering Appraisal Committee (GEAC)** recommended the **environmental release of transgenic mustard hybrid DMH-11.**

#### What is DMH-11?

- The full form of **DMH** is **Dhara Mustard Hybrid.** It is a **genetically modified crop**, only second after GM cotton, to get approval for being inducted into the environment for seed production and testing. GM cotton is commercially used in India.
- The signature feature of DMH is that it carries a gene for **herbicide resistance. i.e. herbicide tolerant.**
- It has been developed by scientists from the **Centre for Genetic Manipulation of Crop Plants (CGMCP), Delhi University.**
- They developed the hybrid containing **two alien genes** isolated from a **soil bacterium** called **Bacillus amyloliquefaciens.**
- The **barnase-barstar GM technology** was deployed to develop **DMH-11.** The researchers took a popular **Indian mustard variety ‘Varuna’ (the barnase line)** with an **East European ‘Early Heera-2’ mutant (barstar).**
- It contains 3 important genes **Bargene, Barnase and Barstar**, all derived from soil bacterium.
- It would be a **high-yielding variety of the mustard crop.**
- This is significant because it can help **India achieve self-sufficiency in oil production and save on forex.** Currently, **India is the world’s leading importer of edible oils** and more than 50% of the domestic demand for edible oils is met through imports.

#### Genetic Engineering Appraisal Committee (GEAC):

- It functions under the **Ministry of Environment, Forest and Climate Change (MoEF&CC)**.
- It is **responsible for the appraisal of activities involving large-scale use of hazardous microorganisms and recombinants in research and industrial production** from the environmental angle.
- The committee is also responsible for the appraisal of proposals relating to the **release of genetically engineered (GE) organisms and products** into the environment including experimental field trials.
- GEAC is **chaired** by the **Special Secretary/Additional Secretary of MoEF&CC** and **co-chaired** by a representative from the **Department of Biotechnology (DBT)**. Presently, it has **24** members and meets every month to review the applications in the areas indicated above.

### Indian scientists build breakthrough gene-editor

**Sub: Sci**

**Sec: Biotech**

**Context:**

- Researchers at **CSIR-IGIB and the L.V. Prasad Eye Institute** has engineered new versions of an **enzyme that can make CRISPR more precise**.

**More on the news:**

- Scientists have developed an **enhanced genome-editing system that can modify DNA more precisely** and more efficiently than existing **CRISPR-based technologies**.
- **CRISPR occurs naturally** in some bacteria, as a **part of their immune system** that limits **infections by recognising and destroying viral DNA**.

**What is CRISPR-Cas9?**

- **CRISPR–Cas9** is a unique technology that **enables geneticists and medical researchers to edit parts of the genome by removing, adding or altering sections of the DNA**.
- It is currently the **simplest, most versatile and precise method of genetic manipulation**.

**How does CRISPR-Cas9 work?**

- The **CRISPR-Cas9 gene editing tool** uses a **guide-RNA (gRNA)** designed to **find and bind to a specific part of the target genome**.
- The **gRNA directs an enzyme, Cas9**, to the target site, which is followed by a short DNA sequence called **protospacer adjacent motif (PAM)**.
- **Cas9 recognises and binds to the PAM sequence**, and acts as a molecular scissor that snips some damaged DNA.
- This automatically triggers the **cell's DNA repair system**, which **repairs the snipped part** to insert the correct DNA sequence.

**What is the “off-target” issue of CRISPR-Cas9?**

- **CRISPR-Cas9** system at times recognise and cut parts of the **genome other than the intended portion**.
- Such **“off-target”** effects are more common when using the **SpCas9 enzyme** derived from **Streptococcus pyogenes** bacteria.

**What is FnCas9?**

- **FnCas9 protein** is a **recombinant Cas9 protein** derived from a **type II-B Francisella novicida** Cas9 and expressed in **E. coli**.
- While **FnCas9**, is **highly precise**, it has a drawback of being **low in efficiency**.
- Researchers from CSIR-IGIB modified and engineered new versions of **FnCas9 by tinkering with amino acids** in FnCas9 that recognise and interact with the **PAM sequence** on the host genome.
- Enhanced **FnCas9 cut target DNA at a higher rate with increased the binding affinity** compared to unmodified FnCas9.
- An enhanced FnCas9-based diagnostic could target almost **twice the number of changes compared to FnCas9**, **increasing the scope of detecting more disease-causing genetic changes**.

### Digital jurisprudence in India, in an AI era

**Sub: Science and tech**

**Sec: Awareness in IT**

**Context:**

- The rapidly-evolving technology does pose a challenge to existing legal frameworks and judicial precedents that have been designed for a pre-AI world.



### What is Generative AI:

- **Generative AI (GAI) stands as a transformative force**, wielding power to revolutionize society in ground-breaking ways, existing legal frameworks and judicial precedents that have been designed for a pre-AI world may struggle to effectively govern this rapidly-evolving technology.
- **Generative AI or generative artificial intelligence** refers to the use of AI to create new content, like text, images, music, audio, and videos.
- **Generative AI is powered by foundation models (large AI models)** that can multi-task and perform out-of-the-box tasks, including summarization, Q&A, classification, and more.

### Safe harbor and liability fixation:

- One of the most persistent and contentious issues in Internet governance has been the fixing of liability on “intermediaries” for content hosted by them.
- The landmark **Shreya Singhal judgment** upheld **Section 79 of the IT Act** which grants **intermediaries ‘safe harbor’** protection against hosting content, contingent upon meeting the due diligence requirements outlined in **Section 3(1)(b) of the Information Technology (Intermediaries Guidelines) Rules**.
- In **Christian Louboutin Sas vs Nakul Bajaj and Ors (2018)**, the Delhi High Court held that **safe harbour protection applies solely to “passive” intermediaries**, referring to entities functioning as mere conduits or passive transmitters of information.
- **Section 16 of Indian Copyright Act 1957** specifically provides that **“no person” shall be entitled to protection of copyright except by the provisions of the Act**.
- The **161st Parliamentary Standing Committee Report** found that the **Copyright Act of 1957** is “not well equipped to facilitate authorship and ownership by Artificial Intelligence”.
- **ChatGPT’s ‘Terms of Use’ attempt to shift liability to the user for any illegal output**.
- The landmark **K.S.Puttaswamy judgment (2017)** by the Supreme Court of India established a strong foundation for **privacy jurisprudence in the country**, leading to the enactment of the **Digital Personal Data Protection Act, 2023 (DPDP)**.

### About Right to Erasure:

- The right to erasure is also known as **‘the right to be forgotten’**.
- The right is **not absolute and only applies in certain circumstances**.
- The DPDP Act introduces the **“right to erasure” as well as “right to be forgotten”**.

### Large language model (LLM):

- A **large language model** is a **computational model notable** for its ability to **achieve general-purpose language generation** and other natural language processing tasks such as classification.
- **LLMs are trained on huge sets of data — hence the name “large.”**
- LLMs are built on machine learning: specifically, a type of neural network called a transformer model.

### What is the Internet Archive and why is it facing a backlash from book publishers?

**Sub: Science and tech**

**Sec: Awareness in IT**

**Context:**

- Internet Archive, parent of Wayback Machine, is facing a serious legal hurdle from book publishers.

### What is the Internet Archive?

- The Internet Archive is an **American nonprofit digital library founded in 1996 by Brewster Kahle**.
- It provides **free access to collections of digitized materials** including websites, software applications, music, audiovisual, and print materials.
- **The Archive** also advocates for a **free and open Internet**.

### What is the case against the Internet Archive?

- In the case **Hachette vs Internet Archive that began in 2020**, traditional publishers Hachette, HarperCollins, Wiley, and Penguin Random House sued Internet Archive.
- These publishers have alleged that **Internet Archive violated their copyrights and illegally made their books available** to the public as well, by scanning physical copies and distributing the digital files.
- On March 24 last year, **District Judge John G. Koeltl issued an order in favour of the publishers**.

### What is a Wayback Machine?



- **The Wayback Machine is a digital archive of the World Wide Web** founded by the **Internet Archive**, an American nonprofit organization based in San Francisco, California.
- **Using Wayback Machine is easy and free of cost**, though **results are not always guaranteed**.
- While Wayback Machine is useful for personal research or to access information sources, users should be cautious about relying on the data obtained through such sources, as the **saved information can sometimes be outdated or inaccurate**.

### Content determined by volunteer editors, says Wikipedia parent

**Subject: Science and Tech**

**Sec: Awareness in IT**

**Context:** The **defamation suit by Asian News International claims ₹2 crore** in damages from the Wikimedia Foundation, which runs Wikipedia.

**More About News:**

- The **Wikimedia Foundation** has responded to the **lawsuit** this week by **Asian News International (ANI)**, the **newswire agency** that supplies **video and text feeds** to several news organisations in India
- ANI had sued the Wikipedia parent demanding **₹2 crore** for what it said were defamatory allegations in the introduction section of its page on the online encyclopaedia — such as its alleged **pro-government bias** and tendency to **cite misinformation**.
- The **Hon'ble Delhi High Court** has issued a **summons** to the **Wikimedia Foundation** regarding a **defamation case filed by ANI** against the Foundation.
- Wikipedia's content is determined by its **global community of volunteer editors** (also known as the 'Wikimedia Community') who compile and share information on notable subjects."
- Wikipedia's **volunteer-centric editorial norms** against Indian regulations like the **IT Rules, 2021**, which require all loosely defined internet **"intermediaries"** to **take action against content online if it is, among other things, defamatory**, and a **court or government order is issued against them**.
- One of the **main constraints** in this case is that **Wikipedia globally abstains** from the kind of article-level control over its content that such regulations demand of **online platforms**, deferring instead to its **vast network of volunteer editors**.

**IT Rules:**

- The **IT Rules derive their authority from the Information Technology Act, 2000**, which provides legal recognition for electronic commerce.
- **Safe Harbour Provision:**
  - The Act **provides a "safe harbour" for intermediaries** that observe due diligence in discharging their duties and follow guidelines prescribed by the state.
- **Section 79** of the Act **grants immunity** to intermediaries, as long as they follow due diligence and state-prescribed guidelines.
- Intermediaries **include social media platforms** like WhatsApp, Twitter, Facebook, and Instagram.
- The **2021 IT Rules replaced the previous guidelines** and **sought to regulate intermediaries and digital news media**.
- Social media platforms were **required to provide technological solutions** to identify the **first originator** of any information, **risking privacy**.
- The **amendments introduced in April 2023** give the government power to decide for itself **what information is bogus** and **exercise wide-ranging powers of censorship** by compelling intermediaries to take down posts deemed fake or false.
- The new regulations **threaten freedom of speech and civil liberties** in India by restricting speech through executive order rather than legislation.
- **Article 19(1)(a)** of the Indian Constitution grants every citizen the right to **freedom of speech and expression**, which can only be limited through **reasonable restrictions** made by law on the grounds stipulated in Article 19(2).
- **Fake news and misinformation are not grounds on which speech** can be limited, and the amendments made to the IT Rules do not caveat the restraints they place in any manner.

### What caused the global Microsoft outage?

**Sub: Sci**

**Sec: Awareness it and computer**

**Context:**

- A major outage in **Microsoft's cloud services** on Friday (July 19) has hit businesses across the world, from airlines and financial services to media groups and healthcare.

### More on News?

- It was reported that on late Thursday several users in the Central US region experienced issues with **Azure services and its Microsoft 365 suite of apps**.
- The list of services impacted by the outage includes **Microsoft Defender, Intune, Teams, PowerBI, Fabric, OneNote, OneDrive for Business, SharePoint Online, Windows 365, Viva Engage, Microsoft Purview, and the Microsoft 365 admin center**.

### What caused the outage?

- **Microsoft** has revealed that the outage which prevented users from accessing several **Microsoft 365 apps** was due to a **'Configuration change'**.
- According to **Microsoft's Service Health Status** page, the **configuration change** in a section of their **Azure backend workloads** was causing interruption between **storage and compute resources**.
- This **rendered several apps from Microsoft 365 apps unusable**.
- **Another potential reason** cited by the news report is a **wrong software update** from the **cybersecurity company** called **CrowdStrike** which produces **anti-virus software**.
- **Fault** in the **"Falcon sensor"** used by US-based **cybersecurity** provider **CrowdStrike** caused **System crash** with **blue screen of death (BSOD)** errors. impacting many organizations and services worldwide, including banks, airlines, airports, TV stations, and hospitals.

### What is 'Configuration change'?

- **Configuration change** control is a **set of processes and approval stages** required to change a **configuration object's attributes** and to re baseline them.
- **All proposed configuration changes** must maintain or **enhance the level of system security** and shall not, in any way, degrade existing levels of **system security safeguards**.

### What is the Blue screen of death?

- The **blue screen of death** is a **critical error screen displayed by Microsoft Windows**.
- It indicates a **system crash**, in which the **operating system reaches a critical condition** where it can **no longer operate safely**.
- **BSODs** can be caused by **poorly written device drivers** or **malfunctioning hardware**, such as faulty memory, power supply issues, **overheating of components**, or hardware running beyond its specification limits.

### What is a PC emulator, and why did Apple allow it on the App Store?

**Sub: Science and tech**

**Sec: Computer and IT**

**Context:**

- **Apple has recently changed** its policy to **allow emulators on its official app store**.
- The move will allow users to run classic software, mostly games on iOS, iPadOS and visionOS.

### What is an emulator for a PC?

- An **emulator, as the name suggests**, is software that **allows a computer device to emulate another software**.
- With the help of an **emulator**, a host system **can run software, programs**, which are **designed for the guest system**.
- **Emulators are commonly used** to play **video games from older consoles**, and **test software across different platforms**.
- **Allowing emulators** on its App Store could help the **iPhone-maker ensure users do not use third-party app stores in the EU to download emulators**.

### Are PC emulators legal?

- **Using an emulator is considered legal** if users **own the software** they are running on the emulator.
- However, **if users use the emulator to run pirated copies of a software or use the emulator to distribute or download ROMs** of software they do not own, **it is considered illegal**.
- **Emulators are legal to use and distribute in India**, users may land in trouble if they use emulators to run software such as games, operating systems, or applications) without the proper licenses or ownership.

### What are the risks associated with the emulator?

- If the **emulator is downloaded from unofficial sources** they can **infect the host system with viruses**.
- **Emulators can never provide the 100% accurate** results guaranteed by real device testing.
- Emulators can also **impact the performance of a device** since they are resource-intensive and may **lead to decreased CPU performance, overheating, and potential damage to the battery**.

## Why AI's present and future bring some serious environmental concerns

**Sub: Sci**

**Sec: AWARENESS IN IT and computer**

**Context:**

- Google reported a **13% increase in emissions in 2023** compared to 2022.
- The rise was mainly due to **increased electricity consumption in data centres and supply chains.**
- **Data centres used 17% more electricity in 2023**, largely due to the **growing deployment of AI tools.**

**Energy Consumption by AI:**

- **AI tools**, such as those used in **chatbots**, consume significantly more energy than regular Google searches.
- Studies show that an **AI query can use 10 to 33 times more energy** than a typical search, with **image-based AI searches consuming even more.**
- **Reasons for Higher Emissions**
- **AI models** process and sift through **more data**, requiring more **electrical signals** and **generating more heat.**
- The **increased heat** demands **more powerful cooling systems in data centres**, further **increasing energy consumption.**

**Global Impact of AI on Energy Consumption:**

- The **widespread use of AI** is expected to **sharply increase global energy consumption.**
- **Data centres** currently account for **1-1.3% of global electricity demand**, potentially **rising to 1.5-3% by 2026.**
- In countries like **Ireland** and the **United States**, **data centres** already consume significant portions of national electricity demand.

**Concerns for India:**

- In **India**, the **environmental impact of AI and data centres** is **expected to grow.**
- The **increased demand for water resources for cooling data centres**, noting a lack of adequate data on water consumption.
- The need for **efficient planning and measures to minimize the environmental impact as AI and data centres expand in India.**

**Potential Positive Impact of AI:**

- Some estimates suggest that **large-scale AI deployment could reduce global emissions by 5-10% by 2030.**
- **AI can help monitor and optimize existing processes to reduce wastage and inefficiencies**, potentially **generating significant economic value.**

## What are the various efforts being taken to mitigate caller ID spoofing?

**Sub: Sci**

**Sec: Awareness in IT and Computer**

**Context:**

**What is caller ID spoofing?**

- **Caller ID spoofing** is a technique with which the phone number that a **call appears to originate from can be falsified.**
- Spoofing techniques have been **honed by enthusiasts, telemarketers, and fraudsters alike, over the years.**
- It is used to carry out **social engineering attacks, where the spoofed caller ID is abused for the implicit trust** that the receiving party associates with it.
- As per **Department of Telecommunication(DOT)**, using **spoofed call service is illegal** as per the **Indian Telegraph Act, Sec 25(c).**

**What are the efforts undertaken to mitigate caller ID spoofing?**

- **The International Telecommunications Union (ITU)** in 2021 provided a reference using **Public Key Infrastructure (PKI)** based authentication which could be implemented by Indian telecom operators to **fix caller ID spoofing for good.**
- **The Telecom Regulatory Authority of India (TRAI)** had earlier recommended to telecom operators to integrate a system known as **Calling Name Presentation (CNAP)** which allows consumers to know who is calling them in a way similar to TrueCaller.
- DoT is reportedly in the process of launching a **pilot of the CNAP project.**
- DoT has devised a system to **"identify and block"** international calls with a manipulated **Calling Line Identity (CLI)** and has issued directions to telecom operators to prevent such calls from reaching subscribers.

- **Section 20 of The Telecommunications Act, 2023** empowers the Government to take “**temporary possession of any telecommunication service or telecommunication network from an authorized entity**” for “any public emergency, including disaster management, or in the interest of public safety.”

**What is the International Telecommunications Union (ITU)?**

- **The International Telecommunication Union** is a **specialized agency of the United Nations** responsible for many matters related to information and communication technologies.
- It was established on **17 May 1865** as the **International Telegraph Union**, significantly predating the UN and making it the **oldest UN agency**.
- It has a membership of **193 countries and more than 1000 companies, universities and international and regional organizations**.

**What is Telecom Regulatory Authority of India (TRAI)?**

- **The Telecom Regulatory Authority of India (TRAI)** was established in 1997 under the **Telecom Regulatory Authority of India Act, 1997**.
- **TRAI regulates** telecom services including **fixation/revision of tariffs for telecom services** which were earlier vested in the Central Government.
- It also **aims to provide a fair and transparent policy environment** which promotes a **level playing field and facilitates fair competition**.

## Announcing the first Machine Unlearning Challenge

**Sub: Sci**

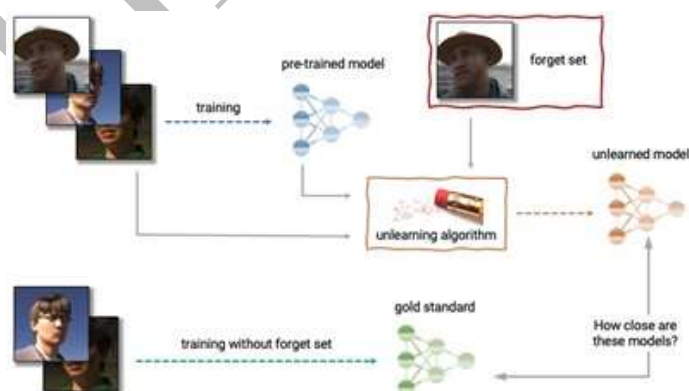
**Sec: Awareness in IT**

**Context:**

- **Google** announced the **first Machine Unlearning Challenge**, which will be held as part of the **NeurIPS 2023** Competition Track.

**What is Machine Unlearning:**

- **Machine unlearning** refers to the **process of selectively removing specific training data points and their influence on an already trained model**, making the updated model behave the same as a model that was never trained on that data.
- It provides a ‘**subtractive**’ capability to **adapt models by removing unauthorized, malicious, or outdated data points** without full retraining.
- Machine unlearning **plays an important role in ML models**.
- The field of machine unlearning is related to other areas of machine learning such as **differential privacy, life-long learning, and fairness**.



**What are the challenges of machine unlearning?**

- The problem of unlearning is complex and multifaceted as it involves **several conflicting objectives like forgetting the requested data, maintaining the model’s utility** (e.g., accuracy on retained and held-out data), and efficiency.
- Also the **evaluation of forgetting algorithms** in the literature has so far been **highly inconsistent**.
- Another challenge in this space is the **effective erasure of data** that has been requested to be deleted.
- The unlearning process itself **can leak information in multiple ways**.
- **Tracing each data point’s influence becomes increasingly difficult** as the dataset changes dynamically.

**Unlearning challenge:**

- **Google** announced the **first Machine Unlearning Challenge**, which will be held as part of the NeurIPS 2023 Competition Track.
- The goal of the competition is twofold.
  - **Unifying and standardizing the evaluation metrics for unlearning** to identify the **strengths and weaknesses of different algorithms** through apples-to-apples comparisons.
  - **Opening this competition to everyone**, will foster novel solutions and shed light on open challenges and opportunities.
- The competition was **hosted on Kaggle** and ran between mid-July 2023 and mid-September 2023.

## DRDO takes up preliminary study on development of indigenous conventional submarine

**Sub: Science and tech**

**Sec: Defence**

**Context:**

- As the procurement of new submarines under **P-75I goes on**, the **Defence Research and Development Organisation (DRDO)** has taken up a preliminary study on the design and development of an indigenous conventional submarine under **Project-76**.

**More on news:**

- DRDO is expected to take upto a year after which a formal case will be put up to the **Cabinet Committee on Security (CCS)** for project sanction.
- This will be a continuation of the **Advanced Technology Vessel (ATV) project**, to build a conventional submarine, under which the Arihant series of nuclear ballistic missile submarines (SSBN) are being built and another project for building nuclear-powered submarines (SSN) is currently underway.
- Under **P-76**, there will be **substantial indigenous content, including weapons, missiles, combat management system, sonars, communications, Electronic Warfare suite, mast and periscope**.
- The Navy has a 30-year submarine building programme and after the P-75I, it intends to design and build conventional submarines indigenously.

**About Air Independent Propulsion:**

- An **Air Independent Propulsion (AIP)** module designed and developed by DRDO is now awaiting fitment on the Scorpene class submarines.
- The **first Scorpene-class submarine Kalvari** is expected to go for refit in 2025 when the fitment process would begin and is expected to take 2-3 years.
- An **AIP module acts as a force multiplier** as it enables conventional submarines to remain submerged for longer duration thereby increasing their endurance and reducing chances of detection.
- An AIP module is inside a submarine so there is no corrosion issue and the only aspect to be checked in a submarine is the reliability of the AIP module.
- The **DRDO-developed AIP module is phosphoric acid based which is widely available**.
- An AIP module has a stack of fuel cells generating hydrogen.
- The power output of each fuel cell in the DRDO AIP is 13.5 kW.
- It is being so asked up to 15.5 kW and will eventually be scaled up to 20 kW which will meet future submarine requirements like the P-76.
- The final configuration of the AIP is a stack of 24 fuel cells and the overall output will be higher than the requirement, to build in redundancy and optimize performance.

**About Project 75 (I):**

- The **project was approved in 2007**, is part of the **Indian Navy's 30-year Plan for indigenous submarine construction**.
- It will be the first under the strategic partnership model which was promulgated in 2017 to boost indigenous defense manufacturing.

**About Project 76:**

- **Project-76 will focus on the indigenous design** and development of six new next-generation submarines.
- This project will leverage the **robust ecosystem established through Project-75**, Project-75I, and the ongoing nuclear submarine programs.

**About Cabinet Committee on Security:**



- The Cabinet Committee on Security (CCS) is a cabinet committee of the Government of India that discusses, debates and is the **final decision-making body on senior appointments in the national security apparatus, defense policy and expenditure, and generally all matters of India's national security.**
- It is headed by the **Prime Minister.**
- Its members include the **PM, Ministers of Defence, Home Affairs, Finance and External Affairs.**

## What we know about North Korea's new ballistic missile test

**Sub: Science and tech**

**Sec: Defence**

**Context:**

- Recently, **North Korea** had successfully tested a new tactical ballistic missile capable of carrying a **“super large warhead”.**

**More on news:**

- The test, named **Hwasongpho-11 Da-4.5**, was conducted with a simulated heavy warhead to verify flight stability and accuracy.
- South Korea reported the launch of two ballistic missiles by Pyongyang, adding that the second missile blew up over land soon after the launch.
- **Ballistic missiles**, depending on their design, can carry **conventional high explosives as well as chemical, biological, or nuclear munitions.**

**Sanctions on North Korea:**

- **North Korea is prohibited from testing ballistic projectiles by the UN** and faces several sanctions for advancing its nuclear capabilities.
- North Korea's military is set to conduct another launch of the same type of missile in July to test the **“explosion power”** of the super-large warhead.

**About Hwasongpho-11 Da-4.5:**

- The missile, designated as **“Hwasong-11Da-4.5,”** features a **4.5-ton-class super-large warhead** and was launched by the **General Missile Bureau.**
- The objective of the test was to verify flight stability and hit accuracy at a **maximum range of 500 kilometers and a minimum range of 90 kilometers.**

## DRDO unveils Indigenous Light Tank Zorawar

**Sub : Science and tech**

**Sec : Defence**

**India's Indigenous Light Tank Zorawar:**

- The prototype of **India's indigenous light tank, Zorawar**, is ready and was unveiled on July 6.
- **Developers:** Jointly developed by the **Defence Research and Development Organisation (DRDO)** and **Larsen & Toubro (L&T).**

**Specifications and Capabilities:**

- **Engine:** Currently powered by a **Cummins engine**, with **DRDO** working on developing a new domestic engine.
  - DRDO is developing a new **1400 HP engine** for the **Arjun Mk1A main battle tank** and a **new power pack for the light tank.**
- Designed to operate in **extreme weather conditions** and **high-altitude areas** along **India's northern border.**
- **Weighs less than 25 tonnes**, ensuring it can be **transported by air** and providing **high tactical and operational mobility.**
- **Design Features:**
  - Built in a modular fashion to accommodate future upgrades.
  - Capable of firing at **high angles** and performing **limited artillery roles**, making it a **versatile and agile weapon platform.**

**Strategic Context:**

- **Deployment Need:** The need for a light tank was felt during the standoff with **China** in **Eastern Ladakh** in **2020**, particularly for **operations at high altitudes** like 15,000 feet.
- **Chinese Deployments:** **China** has deployed **modern light tanks** and **armoured vehicles** along the **Line of Actual Control** in **Eastern Ladakh** since 2020.



## NRC in Manipur

Sub : Science and tech

Sec : Defence

**Context:** Recently the Kuki community of Manipur welcomed the Implementation of **NRC if done under strict supervision of the Supreme Court.**

- Previously the **Meitei and Naga** organisations have been **demanding the implementation of the National Register of Citizens** to check infiltration from Myanmar

### About National Register of Citizens (NRC)

- **Definition and Historical Context**
  - Origin: Prepared after the Census of 1951 in Assam to document residents.
  - Scope: Initially housed with Deputy Commissioners and later transferred to Police in the 1960s.
  - Directive: Issued under the Ministry of Home Affairs (MHA).
- **Implementation in Assam**
  - Purpose: Identify Indian citizens amidst migration from East Pakistan (now Bangladesh).
  - Scope: Currently exists only in Assam but may extend to other states.
  - Similar Efforts: Nagaland creating the Register of Indigenous Inhabitants.
- **Updating the NRC**
  - Provisions and Eligibility
  - Legal Basis: Updated under The Citizenship Act, 1955 and The Citizenship Rules, 2003.
- **Inclusion Criteria:**
  - Persons listed in NRC, 1951.
  - Those in Electoral Rolls up to March 24, 1971.
  - Descendants of eligible persons.
  - Migrants from Bangladesh registered between January 1966 and March 1971.
  - Indian Citizens who moved to Assam post March 24, 1971, with proof of residence.
- **Need for the NRC**
  - Identifying Infiltrators: Aims to identify and deport illegal immigrants living in India.
  - Target: Primarily focuses on immigrants from countries other than Pakistan, Afghanistan, and Bangladesh.
  - Exclusions: Certain religious minorities from these countries are exempt under the Citizenship Amendment Act (CAA).
- **Relationship with Citizenship Amendment Act (CAA)**
  - No Direct Link: CAA and NRC are separate but related in immigration policy discourse.
  - CAA's Focus: Grants citizenship to persecuted minorities from Pakistan, Bangladesh, Afghanistan.
- **Conclusion**
  - **NRC's Role:** Essential for identifying Indian citizens and addressing concerns over illegal immigration.
  - **Controversies:** Surrounds potential nationwide implementation and its implications for various communities.

## Operation Dhanush II

Sub : Sci

Sec: Defence

Why in news?

The Army has kicked off an anti-militancy drive in Kupwara named 'Operation Dhanush' to counter infiltration bids from across the LoC to Kashmir valley.

The operation was launched in the wake of increased militant attacks on security forces in the Jammu region.

Line of Control (LoC)

LoC refers to the ceasefire line negotiated by UN after first Indo-Pak war (1947-48)

It was designated as LoC after the signing of Shimla agreement in 1972.

Northernmost point of LoC is called NJ9842.

### LAC vs LoC

	<b>Line of Control</b>	<b>Line of Actual control</b>
--	------------------------	-------------------------------

<b>Boundary between</b>	India and Pakistan	India and China
<b>Legal status</b>	Formally signed by both countries	Not agreed upon by either country
<b>Demarcation</b>	Clearly demarcated	Not clearly demarcated
<b>Bordering states/UT</b>	UT of Ladakh UT of Jammu & Kashmir	Western sector: Ladakh Middle sector: Uttarakhand, Himachal Pradesh Eastern sector: Sikkim, Arunachal Pradesh

## Stealth frigates from Russia to be delivered in September 2024, February 2025

**Subject: Science and tech**

**Sec: Defence**

**Context:**

In October 2016, **India and Russia signed an Inter-Governmental Agreement** for the **four stealth frigates, two directly imported and two to be manufactured by Goa Shipyard Limited.**

**More about News:**

- After a series of delays, **two stealth frigates (Krivak or Talwar-class stealth frigates)** under construction in **Russia** for the **Indian Navy** are set to be delivered soon **beginning Construction and deliveries were delayed due to COVID, war in Ukraine and western sanctions.**
- **First ship Tushil is ready for acceptance by the Indian Navy** and is scheduled to be **delivered by September.**
- The **second ship Tamal** is expected to be **delivered by February 2025.**
- A **\$1-billion deal** was subsequently **signed** for the **two frigates** under direct purchase. In **November 2018**, the **GSL signed a \$500 mn deal with Rosoboronexport of Russia** for **material, design and specialist assistance to locally manufacture** the two frigates, and in **January 2019**, the contract was signed between the **Indian Defence Ministry and GSL.** All the four ships are powered by **engines from Zorya-Mashproekt of Ukraine.**
- As per schedule, **GSL is scheduled to deliver the first ship in 2026 and the second one six months later.**
- The basic structures of **two frigates** were lying at **Yantar shipyard in Russia** which were punched by India. They are now being finished. The **Indian Navy already operates six of these frigates weighing around 4,000 tonnes each.**

**Frigates:**

- A frigate is a **type of warship.** In different eras, the **roles and capabilities** of ships classified as frigates have varied. The name frigate in the **17th to early 18th centuries** was given to any full-rigged ship built for speed and manoeuvrability, intended to be used in **scouting, escort and patrol roles.**

**INS Tushil:**

- It is the **first Krivak-III frigate** to be acquired under **Project 11356M.**
- **Project 11356M:**
  - **India in October, 2016** signed an Inter-Governmental Agreement (IGA) with Russia to purchase/construct **four additional Admiral Grigorovich-class (Project 11356M) frigates** through a partnership between **Russian and Indian shipyards.**
  - Russia will supply **two of the frigates (INS Tushil and INS Tamala)**, while the other two will be constructed in India.
  - The **Talwar-class frigates, or Project 11356**, are a class of stealth-guided missile frigates.
  - Under the **IGA**, Russia would provide **technical assistance** in setting up production of **11356 project frigates in India.**
  - The construction of the ships is based on the **Indian Navy's specific requirements to meet the entire spectrum of naval warfare** in all three dimensions of **air, surface, and sub-surface.**
- **Features:**
  - These ships feature "**stealth technology**" in terms of **low radar and underwater noise signatures.**
  - These ships are being **equipped with major Indian-supplied equipment** such as **surface-to-surface missiles, sonar systems, surface surveillance radar, communication suites, and anti-submarine warfare systems,** along with Russian surface-to-air missiles and gun mounts.
  - The frigates are designed to **fight submarines and warships in brown and blue waters and repel air attacks** both independently and within formations.
  - The **displacement is 3620 tons, the length is 124.8 meters. The full speed is 30 knots, and the cruising range is 4850 miles.**

## Kargil Vijay Diwas: How India conquered Kargil's inclement conditions, 25 years ago

**Subject: Sci**

**Sec: Defence**

**Context:**

The Kargil War **officially ended 25 years ago, on July 26, 1999**. The **Kargil Vijay Diwas**, observed annually on this day, **commemorates India's victory against Pakistan**, and the **sacrifices of her soldiers**, who braved much more than just the Pakistani infiltrators to **emerge victorious in Kargil**.

**The Kargil War**

- The conflict was triggered when infiltrators from **Pakistan crossed the LoC** and occupied **high positions in Ladakh's Kargil district**.
- First reported to the **Indian Army on May 3**, the **infiltrators were initially thought to be jihadis**.
- Between **mid-May and July**, the **Indian forces slowly recaptured critical positions from the Pakistanis, in the face of heavy casualties**.
- The Army announcing the **complete withdrawal of all Pakistani regular and irregular troops from Kargil on July 26**.

**Trial by altitude**

- **Kargil is located at the northern edge of the LoC**, some **200 km northeast of Srinagar** and **230 km west of Leh**.
- **Kargil town lies at an altitude of 2,676 m (8,780 ft)**, Dras lies at a **height of 3,300 m (10,800 ft)**, and the surrounding peaks rise to altitudes of **4,800 m (16,000 ft) to 5,500 m (18,000 ft)**.
- These **extreme heights** cause severe **physiological effects on the one's body**— and equipment. “The combination of **thin air, cold weather and rugged mountains** has dramatic effects on men and their equipment.”
- **Challenge number one** was the **crippling cold**. The **battlefield in Kargil lay in a cold desert** where **winter temperatures dropped to as low as -30 degrees Celsius**.
- While the **summers were more pleasant, frigid winds and the barren landscape** still made the battlefield
- The cold impacted both the men and the machines – **guns jammed while their operators expended great amounts of energy to keep the body warm**.
- Problem **number two** was the **thin air, and reduced oxygen levels**. This led to a wide range of physiological effects among soldiers including **acute mountain sickness (AMS)**, which can cause **headaches, nausea, appetite loss, muscular weakness, and general fatigue**.
- **Low air pressure** impacted the performance of **both weapons and aircraft**. While it **increased the range of the projectiles fired, accuracy and predictability suffered**. Aircraft engines produced **less power, and helicopters lost rotor efficiency**.
- Lastly, the terrain imposed significant restrictions on soldiers. It **reduced mobility, provided cover to the enemy, and limited the scope of operations**.

**Victory against all odds**

- **Units initiated acclimatisation and training programs** to better prepare the soldiers for the conditions.
- **Better cold-weather equipment was procured** (although the Army remained lacking in this regard throughout the War).
- **Techniques for high-altitude assault** were further honed.
- Instead of daytime frontal attacks, assaults increasingly featured **small groups scaling near-vertical terrain**.
- With limitations of providing air cover to the ground forces due to the **altitude and the terrain, the Army eventually leaned heavily on artillery**, especially the controversial **Bofors gun whose range nearly doubled in the thin air of Kargil**.
- **India's hard-fought victory in the Kargil War** illustrated the **timeless challenges** posed by **combat at high altitude** – challenges which are as deadly, if not more, than the enemy itself.

## The two vaccines that brought us to the brink of eradicating polio

**Sub: Science and tech**

**Sec: Health**

**Context:**

- The wild poliovirus is restricted to pockets of **Afghanistan and Pakistan**, and is beginning to reappear from here in big cities in these two countries.

**About Polio:**

- **Polio is also called Poliomyelitis**.

- It is a **viral disease that destroys the nerve cells present** in the spinal cord, causing paralysis or muscle weakness to some parts of the body.
- It is a **contagious disease** affecting the **nervous system** and is **caused by Picornaviridae – a poliovirus**.
- The virus is transmitted by person-to-person through the following ways –
  - **1) Through the fecal-oral route.**
  - **2) By contaminated water or food.**
- This virus **primarily grows and multiplies in the intestine**, from where it can attack the nervous system and will cause polio and paralysis on an advanced level.
- In 1948, microbiologists **John F. Enders, Thomas Weller, and Frederick Robbins** were trying to find a method to grow different viruses in cell cultures.
- **The poliovirus has only one natural host — humans —** and many of the early strains of the virus were isolated from humans and wouldn't infect non-human primates.
- The inability to culture polio in non-nerve cells was a major roadblock to developing a polio vaccine.

#### **Eradication targets:**

- **Polio eradication is one of the top priorities of the World Health Organisation (WHO).**
- **Africa was declared polio-free in August 2020;** the wild poliovirus has been restricted to rural pockets in Afghanistan and Pakistan.
- The WHO's Global Polio Eradication Initiative is thus set to miss its deadline of eradicating polio by the end of 2024.

#### **Various Polio vaccines:**

##### **Salk:**

- Salk made the **first successful vaccine for polio**.
- It was an **Injectable Polio Vaccine (IPV)**
- Salk inactivated the virus by treating it with formaldehyde, and injected it into his test subjects.
- The fragments of the inactivated virus were able to induce immunity in their bodies.
- Since the vaccine was **introduced into the muscle**, it generated **systemic immunity**.
- The **immune system** has two main parts: **the systemic and the mucosal**.
- The **systemic component** includes the **blood, the brain, and all other organ systems**.
- The **mucosal component** includes the **inner linings of the digestive and respiratory systems, the urogenital tract, and the eyes**.
- These regions are lined with mucous membranes that provide an additional layer of protection, as they frequently come into contact with the external environment.

##### **Sabin:**

- Albert Sabin developed another vaccine that contained **live polio strains weakened by growing them serially in macaque cells**, making them unfit for human infection.
- This was the **oral polio vaccine (OPV)**.
- OPV went into the stomach, it induced a **powerful protective mucosal immune response** right where the virus would have to begin its infection.

#### **Advantages of OPV over IPV:**

- The **OPV vaccine induced a protective response** at the viral entry site — the gut — allowing it to provide a **much greater degree of protection relative to the IPV**.
- The OPV was administered orally and didn't require syringes or trained personnel for its administration.

#### **Challenges in OPV:**

- The **weakened virus in the OPV would revert**, and would do the very job it was designed to prevent: cause polio.
- **The IPV**, while being a less potent vaccine, contained inactivated virus particles and **carried no risk of causing vaccine-induced polio**.
- The world has used both vaccines in the fight against polio.
- While some countries, such as Norway, Sweden, Finland, and Iceland, relied exclusively on the IPV, **most countries have used a combination of the two**.
- The latter countries prefer the OPV for its superior protection and ease of administration.
- When the **number of natural polio cases drops to zero, they switch to IPV for its enhanced safety**.

## HIV breakthrough: Drug trial shows injection twice a year is 100% effective against infection

**Sub: Science and tech**

**Sec: Public Health**

**Context:**

- A large clinical trial in **South Africa and Uganda** has shown that a twice-yearly injection of a new **pre-exposure prophylaxis drug** gives **young women total protection from HIV infection**.

**More on news:**

- The trial tested whether the **six-month injection of lenacapavir** would provide better protection against **HIV infection than two other drugs, both being daily pills**.
- All three medications are **pre-exposure prophylaxis (or PrEP) drugs**.
- **Purpose 2** is being conducted in a number of regions including some sites in Africa among cisgender men, and transgender and nonbinary people who have sex with men.

**About the trials:**

- **Lenacapavir (Len LA) is a fusion capsid inhibitor**.
- It interferes with the **HIV capsid, a protein shell that protects HIV's genetic material** and enzymes needed for replication.
- It is administered just under the skin, **once every six months**.

**Significance of these trials:**

- There were **1.3 million new HIV infections** globally in the **past year**.
- Although that's fewer than the 2 million infections seen in 2010, it is clear that at this rate we are not going to meet the HIV new infection target that **UNAIDS set for 2025** or potentially even the **goal to end Aids by 2030**.
- PrEP should be provided alongside HIV self-testing, access to condoms, screening and treatment for sexually transmitted infections and access to contraception for women of childbearing potential.

**What is PrEP?**

- **PrEP** refers to the use of **antiretroviral drugs** to prevent **HIV infection** in individuals who are at **high risk of acquiring the virus**.
- The drugs used in PrEP are called **Truvada**, a combination of **two antiretroviral medications – Tenofovir disoproxil fumarate (TDF) and Emtricitabine (FTC)**.

**What is HIV?**

- **HIV (human immunodeficiency virus)** is a virus that **attacks cells** that help the body fight infection, making a person more **vulnerable to other infections and diseases**.
- It is **spread by contact** with certain **bodily fluids of a person with HIV**, most commonly during **unprotected sex** (sex without a condom or HIV medicine to prevent or treat HIV), or through **sharing injection drug equipment**.
- If left untreated, **HIV can lead to the disease AIDS** (acquired immunodeficiency syndrome).
- The human body **can't get rid of HIV** and **no effective HIV cure exists**.
- However, effective treatment with **HIV medicine (called antiretroviral therapy or ART)** can **reduce the amount of HIV in the blood** (also called the **viral load**) to a very low level.

## Centre issues advisory, self-declaration for ads on food and health products only

**Sub: Sci**

**Sec: Health**

**Context:**

- The **Ministry of Information & Broadcasting (MIB)** issued a fresh advisory, asking the advertisers and advertising agencies issuing advertisements for products and services related to the food and health sectors to upload an annual self-declaration certificate on the platforms made available for the purpose.

**More on news:**

- The advisory is **limited to the food and health sector only**, meaning these sectors are only required to **provide the self-declaration certificate annually**.
- The media houses are relieved from the responsibility of checking/validating the certificates.

**New Advisory:**

- According to the new advisory, the **facility for uploading the self-declaration certificate** by the advertisers/advertising agencies has been **made available on the Broadcast Seva Portal** for TV/radio advertisements and on the **portal of the Press Council of India** for the advertisements on print media/internet.
- The advertisers/advertising agencies issuing advertisements for **products and services related to food and health sectors** have been advised to upload an annual self-declaration certificate on above platforms.
- It shall be the **responsibility of the advertisers/advertising agencies** to ensure that **every advertisement being issued by them** is in adherence to the applicable Indian laws, rules, and regulations in letter and spirit.

#### Supreme court view:

- **The Supreme Court** in its judgment under **Article 32** of the Constitution of India has stressed on the **right of a consumer** to be made aware of the **quality of products** being offered for sale by **manufacturers, service providers, advertisers, and advertising agencies**.
- It was directed that **before an advertisement is printed/aired/displayed, a self-declaration shall be submitted** by the advertiser/advertising agency on the lines contemplated in **Rule 7 of the Cable Television Networks Rules, 1994**.

#### After 2019 ban on colistin, Centre recommends prohibiting use of 2 more antibiotics in food-producing animals

##### Sub: Science and tech

##### Sec: Health

##### Context:

- Apex advisory body **Drugs Consultative Committee (DCC)** has recommended a **complete ban on the import, production, distribution and sale of two antibiotics i.e. chloramphenicol and nitrofurans** for use in food animal production systems.

##### More on news:

- The DCC's decision stems from concerns raised by **Marine Products Export Development Authority (MPEDA)**, the **nodal agency for the development of the seafood industry in India**, especially focusing on exports of marine products.
- Earlier in 2019, **MoHFW banned colistin which is a last-resort antibiotic** listed as a **highest priority critically important antimicrobial (HPCIA)** by the **World Health Organization (WHO)**, in food-producing animals, poultry, aquaculture, and animal feed supplements.
- The notification established **stringent maximum residue limits of 0.001 milligrams per kilogram for these antibiotics**, except for chloramphenicol, which has an even stricter limit of 0.0003 mg/kg.

##### Substances Banned:

- As per **Coastal Aquaculture Authority (CAA) guidelines, 20 antibiotics** and other pharmacologically active substances **are banned for use in shrimp aquaculture**.
- This includes **chloramphenicol and types of nitrofurans**, including **furaltadone, furazolidone, furylfulamide, nifuratel, nifuroxime, nifurprazine, nitrofurantoin and nitrofurazone**.
- Their detection in exported shrimp is a matter of significant concern, leading to shipment rejections, especially for markets with strict regulations like the European Union, United States and Japan.
- This poses a **barrier to expanding trade** into these markets.

##### About Chloramphenicol:

- **Chloramphenicol** is recognised by the **WHO** as a **Highly Important Antimicrobial (HIA)**.
- It is a **broad-spectrum antibiotic used for various infections**, including superficial eye infections, enteric fever, typhoid fever and central nervous system infections such as acute bacterial meningitis.

##### About Nitrofurantoin:

- **Nitrofurantoin derivatives** are classified as **Important Antimicrobials (IA)** by **WHO**.
- Nitrofurantoin, a type of nitrofurantoin derivative, is **used for treating urinary tract infections**.
- Many countries, including parts of the **European Union and the USA**, have already **banned the use of nitrofurans in food-producing animals**.

##### Medically important antimicrobials:

- **WHO** publishes an updated list of **medically important antimicrobials**.
- The medically important antimicrobials group is further divided into **“highest priority critically important antimicrobials (HPCIA),” “critically important antimicrobials (CIA),” “highly important antimicrobials,”** and **“important antimicrobials.”**

##### CDSCO:

- **The Central Drugs Standard Control Organisation (CDSCO)** is India's **national regulatory body** for cosmetics, pharmaceuticals and medical devices.



- It serves a **similar function to the Food and Drug Administration (FDA)** of the United States or the European Medicines Agency of the European Union.
- It works under the **Ministry of Health & Family Welfare**.
- Within the CDSCO, the **Drug Controller General of India (DCGI)** regulates **pharmaceutical and medical devices**.
- The **DCGI is advised by the Drug Technical Advisory Board (DTAB)** and the **Drug Consultative Committee (DCC)**.

#### **Coastal Aquaculture Authority (CAA):**

- **The Coastal Aquaculture Authority Act, 2005** enacted by the Parliament of India on 23 June 2005 **provides for the establishment of the Coastal Aquaculture Authority** for regulating the activities connected with coastal aquaculture in coastal areas.

#### **Radiation Biodosimetry: the ABCs of responding to a mass radiological event.**

**Sub: IR**

**Sec: Health**

**Context:**

- **Radiation biodosimetry is extremely important** in responding to a large-scale radiological event, such as an **Improvised Nuclear Device or reactor accident**.
- It helps in the **assessment of the level of radiation** and the **administration of drugs** in accordance with the exposure levels.

**What is biodosimetry?**

- **Biodosimetry** allows the measurement of the **amount of radiation to which an individual was exposed** based on **changes in blood, urine, or hair**.
- It would be particularly **useful in a radiological event** where the exposed **individuals do not carry any personal radiation monitoring devices**.

**Methods employed in biodosimetry:**

1. **Gold standard biodosimetry assay/Dicentric Chromosome Assay (DCA)**
  - **The gold standard biodosimetry assay** is measurement of chromosome aberrations, in **white blood cells**.
  - **The International Commission on Radiation Units and Measurements and International Atomic Energy Agency** have issued guidance on performing biodosimetry and interpreting data.
  - **When irradiated, DNA in the blood cells gets broken** and is repaired within a few hours.
  - In some cases, there is an **incorrect repair**, joining fragments from different chromosomes, forming a **'DicentricChromosome (DC)' – a chromosome with two centromeres**.
  - **DC can only be formed by radiation**, measuring these chromosomes is a specific and sensitive indicator of past radiation exposure.
  - In order to measure DC, lymphocytes from the exposed individuals are cultured to begin division and then the chromosomes are spread on a slide and stained.
  - The **Dicentric Chromosome Assay (DCA)** has been **successfully employed in many radiation accidents**, where the number of exposed people is small.
2. **Cytokinesis Block Micronucleus Assay (CBMN)**
  - In **Cytokinesis Block Micronucleus Assay (CBMN)**, the **white blood cells are made to divide, but arrested before division is complete**.
  - This forms a **cell with two nuclei**.
  - **Post exposure to radiation, some DNA is ejected** during division forming a **'micronucleus'**
  - **This 'micronucleus' helps in determining the exposure to radiation**.
  - Measurement on the **phosphorylated form of specific histone protein** an inherent component of chromosomes known as the **"gamma-H2AX"** assay has the potential to segregate the exposed from that of unexposed and those exposed to low dose versus high dose without culturing cells, within 6-8 hours of time.

**About Rapid Automated Biodosimetry Tool (RABiT):**

- The **Rapid Automated Biodosimetry Tool (RABiT)** is designed to be a **completely automated, ultra-high throughput robotically-based biodosimetry workstation**.
- It analyzes **fingerstick-derived blood samples (30 µl, essentially a single drop of blood)**, either to **estimate past radiation dose**, or to **identify individuals exposed above or below a cutoff dose**.
- The first iteration of the **Rapid Automated Biodosimetry Tool (RABiT)** used custom robotics to perform the **CBMN assay** with a target **throughput of 6000 samples per day per machine**.

### About High-throughput screening:

- **HTS(High-throughput screening)** systems use robotics, liquid handling devices and automated microscopes to quickly conduct millions of chemicals, genetic, or pharmacological tests.

### Central Travancore a sitting duck for avian flu

**Sub: Science and tech**

**Sec: Health**

**Context:**

- **Kerala's Kuttanad region** is battling another devastating **outbreak of bird flu (H5N1)**, but this time the disease has spread beyond the region and **infected crows, kites, pigeons and herons**, unlike previous times when it was **restricted mostly to poultry**. For the first time though, there's fear of the loss of livelihood and anxiety of humans contracting the disease.

**Details:**

- Crows, herons, kites, pigeons, and even peahen have **tested positive**, raising concerns about a **wider spread** caused by a **virulent mutation of the virus**, challenges in curbing the spread, and a possible jump to **humans**.
- H5N1 has high pathogenicity.
- **Avian influenza** poses a potential **threat to human beings for two reasons: its ability to mutate rapidly and its propensity to acquire genes from viruses infecting other species such as humans**.
- Sporadic bird flu infections have been reported in **humans**, but **no human-to-human transmission** has been reported so far.
- It has left **Snow White, a duck breed** developed by the **Niranom farm**, on the **verge of extinction**.
- **Chara and Chembally** are two local breeds.
- The **National Institute of High-Security Animal Disease (NIHSAD)** is in **Bhopal**.

**Kuttanad region:**

- Kerala's Alappuzha district.
- A below-sea-level region defined by Vembanad Lake, rivers, canals, and swathes of paddy fields, is visited by large flocks of migratory birds.
- **Kuttanad Wetland Agriculture System** is unique, as it is the **only system in India that favours rice cultivation below sea level** in the land created by draining **delta swamps in brackish waters**. As an approach to cope with the imminent climate impacts in coastal areas and evolve efficient methods, it aims to deal with soil availability and flood issues in agriculture.

**About Avian Influenza (AI):**

- **Avian influenza (AI)** is a **highly contagious viral disease** affecting several species of food-producing birds (chickens, turkeys, quails, guinea fowl, etc.), as well as pet birds and wild birds.
- Occasionally **mammals**, including **humans**, may **contract avian influenza**.
- **Influenza A viruses** are classified into **subtypes** based on **two surface proteins, Hemagglutinin (HA) and Neuraminidase (NA)**. For example, a virus that has an **HA 7 protein** and **NA 9 protein** is designated as subtype **H7N9**.
- Avian influenza virus subtypes include A(H5N1), A(H7N9), and A(H9N2).
  - **HPAI A(H5N1) virus** occurs mainly in birds and is highly contagious among them.
  - **HPAI Asian H5N1** is especially deadly for poultry.
- **Prevention:** Strict biosecurity measures and good hygiene are essential in protecting against disease outbreaks.
- **Eradication:** If the infection is detected in animals, a policy of culling infected and contact animals is normally used in an effort to rapidly contain, control and eradicate the disease.

### Hepatitis A vaccination will be cost-effective in Kerala: study

**Sub : Science and tech**

**Sec: Health**

**Hepatitis A virus:**

- **Hepatitis A** is an **inflammation of the liver** that can cause **mild to severe illness**.
- The **hepatitis A virus (HAV)** is transmitted through **ingestion of contaminated food and water** or through **direct contact with an infectious person**.
- Almost everyone recovers fully from **hepatitis A** with a **lifelong immunity**. However, a very small proportion of people infected with **hepatitis A** could die from fulminant hepatitis.

- The risk of **hepatitis A infection** is associated with a **lack of safe water and poor sanitation and hygiene** (such as contaminated and dirty hands).
- A **safe and effective vaccine** is available to prevent **hepatitis A**.
- **Risk factors include:**
  - poor sanitation;
  - lack of safe water;
  - living in a household with an infected person;
  - being a sexual partner of someone with acute hepatitis A infection;
  - use of recreational drugs;
  - sex between men; and
  - travelling to areas of high endemicity without being immunized.

#### **Epidemiological Transition of Hepatitis A in Kerala:**

- With better sanitation and hygiene, **Hepatitis A infection** is transitioning from **early childhood to adolescents and young adults**.
- In **young children (under six)**, the infection is **mild and often asymptomatic**.
- In **older children and adults**, the infection is **symptomatic** and can lead to **severe health issues, including liver injury and death**.

#### **Outbreaks and Current Situation:**

- **Kerala** has experienced **regular hepatitis A outbreaks** over the past two decades, with **annual occurrences since 2017**.
- The **2024 outbreak** is the **largest**, with over 2,400 cases and 18 deaths reported by May 30, 2024.
- Most cases this year are from **Kozhikode, Malappuram, Thrissur, and Ernakulam districts**.

#### **Impact of Improved Sanitation:**

- **Better sanitation and hygiene** have reduced **early childhood infections**, leaving older individuals more vulnerable.
- **Infected children** develop **lifelong immunity**, which is lacking in those who were not exposed early due to improved conditions.

#### **Vaccination:**

- **Vaccination** is proposed as a solution to reduce outbreaks and health expenditures.
- A study in PLOS ONE recommends **vaccinating children aged one year and adolescents aged 15 years**.
- **Vaccines considered:**
  - **Live, attenuated vaccine:** Requires one dose.
  - **Inactivated vaccine:** Requires two doses.

#### **Challenges and Recommendations:**

- **High vaccination coverage (90%)** is necessary to achieve benefits, currently met only for infants.
- **Adolescents are harder to vaccinate** as they fall outside the universal immunization program.
- **Suggested strategy:** School-based vaccination and effective campaigns for adolescents.

#### **How to manage 'brain-eating amoeba' cases**

**Sub : Science and tech**

**Sec : Health**

#### **Context:**

- Four cases, including three deaths, of the rare, but fatal **primary amoebic meningoencephalitis (PAM)** in **Kerala**.
- First detected in **Alappuzha** in **2016**, with subsequent cases in **Malappuram, Kozhikode, Thrissur, and Alappuzha**.

#### **About Primary amoebic meningoencephalitis (PAM):**

- **Cause:** *Naegleria fowleri*, a "**brain-eating amoeba**" found in **warm freshwater** and **poorly maintained pools**.
- **Infection:** Enters through the **nose**, reaching the **brain** and **causing fatal tissue destruction**.
- **Transmission:** Not person-to-person or through swallowing contaminated water.
- **Symptoms:**
  - **Early:** Headache, fever, nausea, vomiting.
  - **Later:** Stiff neck, confusion, lack of attention, loss of balance, hallucinations, coma, and usually death within 5 days (1-18 days).
- **Diagnosis and Treatment:**

- **Detection:** PCR tests of cerebrospinal fluid.
- **Precautions:** Hold nose or wear nose clips while jumping/diving into fresh water, keep head high, avoid digging in shallow waters, use distilled or boiled water for nasal clearing.
- **Treatment:** Following CDC guidelines, using drugs like miltefosine, Azithromycin, and Amphotericin B.

#### Preventive Measures:

- **Guidelines:** Special guidelines for treatment formulated.
- **Advice:** Avoid swimming in stagnant water, use swimming nose clips, and keep water resources clean.
- **Water Management:** Chlorination of water in pools and theme parks.

#### FSSAI mandates salt, sugar, and fat info in bold

#### Sub: Science and tech

#### Sec: Health

#### Context:

- **New nutritional labelling proposals** by the **Food Safety and Standards Authority of India (FSSAI)**.
- **FSSAI aims to enhance consumer awareness by mandating the highlighting of nutritional information (total sugars, salt, saturated fat) in bold letters on food labels.**

#### Details:

- FSSAI approved the proposal in its 44th meeting to amend the **Food Safety and Standards (Labelling and Display) Regulations, 2020**.
- **Parle Products:** Supports **stricter guidelines** for consumer awareness, and plans to review and respond to the draft.
- **Nestlé India:** Already provides **nutritional information**, including **Guideline Daily Amount (GDA) labelling**, and will comply with new regulations.
- **Amul:** Will provide feedback once the regulation is open for comments.

#### Significance:

- Expected to promote **health-conscious behaviour** and **reduce non-communicable diseases (NCDs)**.
- **Challenges:** Initial costs for updating labels and packaging, need for product reformulation.
- **Global Practices:** Some countries, like **Sri Lanka** and **Peru**, mandate **front-of-pack warnings** about **high levels of salt, sugar, and fats**.
- FSSAI considering **front-of-pack nutrition-labelling (FOPNL)** and a **star rating system**.
- **Market Impact:**
  - **India's packaged food market** is valued at **₹4,240 billion**.
  - FSSAI has advised against **misleading terms** like **'health drinks'** and incorrect claims like **'100% fruit juices'** on labels.

#### Food Safety and Standards Authority of India (FSSAI):

- FSSAI is an **autonomous statutory body** established under the **Food Safety and Standards Act, of 2006**.
- The Act of 2006, consolidates various laws related to food, such as the **Prevention of Food Adulteration Act, 1954**, the **Fruit Products Order, 1955**, the **Meat Food Products Order, 1973**, and other acts that were previously handled by different ministries and departments.
- The Act also **aims** to establish a single reference point for all matters relating to food safety and standards, by moving from multi-level, multi-departmental control to a single line of command.
- FSSAI is responsible for protecting and promoting public health by regulating and supervising food safety and quality in India, operating under the Ministry of Health & Family Welfare.
- FSSAI has a headquarters in New Delhi and regional offices in eight zones across the country.
- The **Chairperson** and **Chief Executive Officer of FSSAI**, appointed by **central government**. The **Chairperson** is in the **rank of Secretary** to the **Government of India**.

#### Functions and Powers:

- Framing of regulations and standards for food products and additives.
- Granting of licences and registration to food businesses.
- Enforcement of food safety laws and regulations.
- Monitoring and surveillance of food safety and quality.
- Conducting risk assessment and scientific research on food safety issues.
- Providing training and awareness on food safety and hygiene.

- Promoting food fortification and organic food.
- Coordinating with other agencies and stakeholders on food safety matters.

## Why Karnataka is cracking down on vendors of pani puri and gobi manchurian

**Sub: Science and tech**

**Sec: Health**

**Context:**

- **Karnataka's food safety department** has initiated a statewide crackdown on street food vendors to address the **use of artificial food colouring and other harmful agents.**

**Health Concerns:**

- Since March, three orders have been issued **banning artificial colouring agents** in foods like gobi manchurian, cotton candy, chicken kababs, pani puri, and shawarma.
- Tests revealed the presence of **carcinogenic and harmful bacteria** in food samples.
- **Artificial colouring agents** found include **Tartrazine, Sunset Yellow, Rhodamine B, and Brilliant Blue**, which can cause **cancer, diabetes, kidney failure, and respiratory issues.**
  - **Rhodamine B**, in particular, is a **synthetic dye** used in **textiles** and is harmful to human health.

**Legal Actions:**

- **Sample Testing Process:**
  - Initial survey samples are tested.
  - If unsafe, four legal samples are collected and sent to the **Central Food Technological Research Institute (CFTRI), Mysore, Karnataka**, for further testing.
  - If CFTRI deems them unfit for consumption, legal action is pursued under the Food Safety Act.
- **FBOs found guilty** can face **finest up to Rs 10 lakh** and **imprisonment for up to seven years.**

## How jumping genes and RNA bridges promise to shake up biomedicine

**Sub: Science and tech**

**Sec: Health**

**Context:**

- On June 26, **Nature Published a paper** describing a new **RNA-guided gene editing system.**

**What are jumping genes:**

- **Transposable elements (TEs), also known as "jumping genes,"** are **DNA sequences** that move from **one location on the genome** to another.
- They were discovered by **Barbara McClintock** who received her **Nobel Prize in 1983.**
- There are also **two classes of jumping genes**, called **class I transposons and class II transposons.**
- **Class I transposons are also called retrotransposons** because when they undergo the **process of replication, they first copy their DNA into RNA.**
- **Class II TEs or DNA transposons encode the protein transposase**, which they require for **insertion and excision**, and some of these TEs also encode other proteins.

**How jumping genes are Boon to Synthetic biology?**

- Researchers from the University of Tokyo described the **structural and molecular mechanisms of genome modification guided by bridge RNA.**
- They used **cryo-electron microscopy** to study the **IS110 transposons** and found that it works as a **dimer — a complex compound formed by bonding two copies of a simpler compound.**
- **One copy binds to the target DNA and the other binds to the donor DNA, bridged by the bridge RNA.**
- **DNA recombination mediated by bridge RNA makes a clean cut, making the edit specific and tidy.**
- It can facilitate the **addition, deletion or inversion of DNA sequences of virtually any length** which are currently beyond the reach of **any of the editing tools we have.**
- It can be used to **manage, or even treat, a wide variety of genetic diseases** and a **functional copy of a gene can be replaced in a given genomic location.**

## Scientists find proof pain-sensing cells are either male or female.

**Sub: Science and tech**

**Sec: Health**



### Context:

- A study led by **University of Arizona Health Sciences researchers**, recently published in the journal *Brain*, demonstrated for the **first time functional sexual dimorphism in nociceptors**, the nerve cells responsible for perceiving pain.

### Why do we perceive pain?

- **Nociceptor cells** have bare **nerve endings** and they are found **across our skin, bones, joints, and muscles**.
- The **receptors detect extreme pressure, temperature, and chemical signals** released by the body when it is injured, turn them into electrical signals, and relay them to the **brain via the spinal cord**.
- The brain finally reads the **message and perceives pain**.
- **Activation of nociceptors** likely produces the **same perception of pain in men and women** with the **only difference lies** in the manner of their activation.

### The nociceptor response threshold:

- **Previous studies** have reported that the **nociceptor response threshold in females is lower than that in males**.
- This **difference** could be due to **peripheral nociceptor sensitisation** where the **threshold for pain is lowered by external factors**.
- To understand sexual dimorphism in nociceptors sensitisation, the research team investigated how easily pain receptors in the **dorsal root ganglion — a cluster of nerve cells located near the spinal cord** — could be excited.
- **Dr. Porecca's lab** in 2022 found that **prolactin, a hormone** responsible for the **growth of breast tissue**, also selectively promoted pain responses in female rodents.
- **Receptors for prolactin were expressed** more in female-specific pain disorders such as **endometriosis**.

### What is the new study?

- In the new study, the researchers studied **how prolactin and orexin-B affect nociceptor activation thresholds** in the nerve cell samples.
- On adding the sensitizing substances that lower these thresholds for activation researchers found that **prolactin only sensitizes female cells and not male cells**, and **orexin B only sensitizes male cells and not female cells**.
- **Studies of sleep and chronic pain** also established that **Orexin B, a neurotransmitter** that regulates wakefulness, **produced sensitisation in male rodents but not female rodents**.
- Study concluded that **nociceptors**, the fundamental building blocks of pain, **are different in males and females**.

### Benefit of research:

- It will encourage **medical practitioners to factor in the sex of a patient** when making decisions about pain therapies.
- In clinical trials of therapies with new pain treatment mechanisms, researchers will have to be more careful about the number of men and women in the trial so that they might be alerted to effects that may only occur in one sex.

## Why dengue cases are on the rise

### Sub : Science and tech

#### Sec: Health

**Context:** In the past few weeks, cases of dengue have been rising in some parts of the country. Karnataka, in particular, has been experiencing a rapid surge in cases in the last few days, while the cases have been climbing up in Kerala and Tamil Nadu as well.

### What is dengue?

- Dengue (break-bone fever) is a viral infection that spreads from mosquitoes to people. It is more common in tropical and subtropical climates.
- Most people who get dengue will not have symptoms. But for those who do, the most common symptoms are high fever, headache, body aches, nausea, and rash. Most will get better in 1–2 weeks. Some people develop severe dengue and need care in a hospital.
- In severe cases, dengue can be fatal.
- You can lower your risk of dengue by avoiding mosquito bites especially during the day.
- Dengue is treated with pain medicine as there is no specific treatment currently.

### What is the global situation of dengue?

- According to the World Health Organization (WHO), as of April 30, over 7.6 million cases of dengue were reported in 2024. This included 3.4 million confirmed cases, over 16,000 severe cases and over 3,000 deaths.
- In an update on the global scenario dated May 30, it said that 90 countries have known active dengue transmission, adding that “not all of which have been captured in formal reporting”. WHO pinpointed that the actual burden of dengue is underestimated as many endemic countries did not have strong detection and reporting mechanisms.



- The WHO noted that at least five countries, including India, were grappling with the onset of monsoon season, which created suitable conditions for the breeding and survival of Aedes mosquito. Urbanisation and population movements have also played a pivotal role in the increasing burden in the region.
- WHO observed that the incidence of dengue has grown dramatically around the world in recent decades. “About half of the world’s population is now at risk of dengue with an estimated 100-400 million infections occurring each year. Dengue is found in tropical and sub-tropical climates worldwide, mostly in urban and semi-urban areas,” it pointed out.
- Dengue is endemic in more than 100 countries in the WHO regions of **Africa, the Americas, the Eastern Mediterranean, South-East Asia and Western Pacific**. The Americas, South-East Asia and Western Pacific regions were the most seriously affected, with Asia accounting for around 70% of the global disease burden. However, it also went on to note that dengue is spreading to new areas in Europe, the Eastern Mediterranean and South America.

#### How does dengue spread and how is it treated?

Dengue virus is **transmitted to humans through the bite of infected mosquitoes**, with the primary vector that transmits the disease being **Aedes aegypti**. While cases are mostly asymptomatic or mild, some may develop severe dengue that could include shock, severe bleeding or organ impairment.

According to the National Guidelines for Clinical Management of Dengue Fever, an acute febrile illness of two to seven days duration with two or more of the following manifestations - headache, retro-orbital pain, myalgia, arthralgia, rash and haemorrhagic manifestations - were the clinical features of dengue fever.

#### What are the emerging patterns in dengue?

- Among the several factors associated with an increasing risk of dengue epidemics were changing distribution of **Aedes aegypti vector, urbanisation and human activities fostering conducive environments for vector-host interaction and climate change-induced shifts in weather patterns**, according to WHO.
- Public health officials said that the first epidemic of clinical dengue-like illness was recorded in erstwhile Madras in 1780. Dengue virus was isolated in India during 1945 for the first time. The first evidence of the occurrence of dengue fever in the country was reported in 1956 from Vellore district in the State, they said.
- Noting that dengue was once considered to be an arboviral disease of the urban environment infecting populations in municipalities, corporations and cities, they said the infection has spread to all geographic regions including rural and urban due to rapid increase in urbanisation, expanding travel patterns and climatic changes.

### Nipah monoclonal antibody trials may begin in India in 2025

**Subject: Science and tech**

**Sec: Health**

#### Context:

The Indian drug regulator greenlights it, a human clinical trial to test the safety and efficacy of a novel Nipah monoclonal antibody MBP1F5, which might offer immediate protection to people at risk of infection against the deadly disease, might begin next year.

#### More About News:

- A **trial** will be carried out in **Bangladesh** as well. Though trials on **many vaccines** are currently under way, there is **no approved vaccine against the Nipah virus** anywhere in the world.
- Nipah virus has a **40% to 75% mortality rate** in people who are

#### Outbreaks:

- **India and Bangladesh** have been **chosen for the trial as Nipah virus** outbreaks have been reported in these **two countries in recent years**.
- Nipah **outbreaks** have occurred in **Kerala in 2018, 2019, 2021 and 2023**. In the case of **Bangladesh**, Nipah outbreaks have been **occurring since 2001**; the virus has been reported from **34 of 64 districts** in Bangladesh with **341 cases detected so far and 242 deaths**.
- The **novel Nipah monoclonal antibody** is currently undergoing a phase-1 clinical trial in the U.S., which is carried out by the **S. Department of Defence**.
- The trial in **India and Bangladesh** will begin “upon **completion of the U.S. Department of Defence Phase-1 trial in the U.S**”. The **trial in India is planned to begin in 2025**, pending regulatory review.
- The number of participants who will be recruited for the clinical trial will depend on whether the clinical trial begins as a phase-1 or phase-2 trial in India. But the intention is to recruit at least 200 participants.

#### Study of Nipah Virus:

- Preclinical studies for **pre-exposure prophylaxis** have been completed in **animal models**, the **monoclonal antibody** has demonstrated **high potency against the Nipah virus**, providing it effective at **preventing** the virus from **entering the host cell**.

- The **monoclonal antibody** is designed to **bind to the Nipah virus F protein**, preventing the virus from entering a host cell and causing infection in people.
- This mechanism will offer protection against both known strains of **Nipah virus (Bangladesh and Malaysia)** and its closely related **viral cousin, Hendra virus**, for at least **six months** enough time for vaccine immunity to build.

#### Availability:

- Ensuring **pricing commitments** for **Global South countries**, a reserve of monoclonal antibody doses will be stored in a Nipah-affected country, helping to enable **rapid availability** in the event of an outbreak and accessibility for those most in need.

## Illegal coal mine in Gujarat

**Sub: Sci**

**Sec: Health**

**Context:**

**Three dies of asphyxiation at illegal coal mine in Gujarat.**

**More About News:**

- Three labourers died of asphyxiation inside an illegal coal mine in Surendranagar district of
- Digging for low-grade coal in illegal mines found in several parts of the district. The coal is used to fuel factories in the State and elsewhere.

#### What is Illegal coal mining?

Illegal mining is the extraction of precious metals without following the proper procedures to participate in legal mining activity. These procedures include permits and licenses for exploration of the land, mining and transportation.

**MMDR Act:**

- As per section 23C of the MMDR Act, 1957 the State Governments are empowered to frame rules to prevent illegal mining and the State Governments may, by notification in the Official Gazette, make such rules for preventing illegal mining, transportation and storage of minerals and for purposes connected therewith.

#### Mines and Minerals (Regulation and Development) Act (1957):

- It is an Act of the Parliament of India enacted to regulate the mining sector.
- It was amended in 2015 and 2016. This act forms the basic framework of mining regulation in India.
- This act is applicable to all mineral except minor minerals and atomic minerals.
- It details the process and conditions for acquiring a mining or prospecting licence in India.
- Mining minor minerals comes under the **preview of state governments**.
- For **mining and prospecting in forest land**, prior permission is needed from the **Ministry of Environment and Forests**.

#### Environment Impacts:

- Illegal miners create large mining pits that are not back filled when they are finished, many people and animals die from these pits.
- Due to run off from illegal mining activity contaminates surface water and underground water with mud, Mercury and Cyanide.
- Deforestation occurs during illegal mining operations so mining operations have room to function.
- Carbon emissions increase drastically due to the clear cutting of forests.
- Illegal mining causes soil erosion and degradation which leads to barren lands.

Human Impacts:

- Asphyxiation is caused due to lack of oxygen (or) when you don't get enough oxygen to the body.
- Causes include allergic reactions, drowning and foreign objects blocking your airway.

#### Symptoms:

- Trouble breathing
- Loss of consciousness
- Inability to speak.

**Mine gases:** The air in mines can be contaminated by the presence of other gases such as **carbon monoxide, hydrogen sulphide, methane, and excess of carbon dioxide**

## 100 years of electroencephalography (EEG) in human medicine

**Sub: Science and tech**

**Sec: Health**

**Context:**

- **Electroencephalography(EEG)** has completed **100 years of its discovery** and still remains a crucial tool for **understanding the brain.**

**What is EEG?**

- **EEG stands for electroencephalography.**
- It is a test performed to **detect abnormalities in your brain waves**, or in the electrical activity of your brain.
- **Neurons in the brain** perform various functions by **moving electrically charged particles** such as ions.
- The movement of these particles gives rise to electrical activity that a health worker can use an **EEG test to visualize.**

**How does an EEG test work?**

- During an EEG, **electrodes are pasted onto the scalp of the patient.**
- These are small metal disks **with thin wires and detect tiny electrical charges that result** from the activity of brain cells.
- These **charges are amplified and appear as a graph** on a computer screen or as a recording that may be printed out on paper.
- Health workers are typically interested in two types of data in the graph:
  - **The voltage** (measured in **millionths of a volt**).
  - **The frequency** of the variations (**measured in hertz**).
- The EEG procedure is usually carried out by a highly trained specialist, called a **clinical neurophysiologist.**
- **Volume conduction** refers to the **movement of electrical activity through this three-dimensional volume.** It also stands for the fact that the electrical activity is produced in one place whereas the detectors that detect it are located at some distance.
- **EEG is better** than other diagnostic devices **at tracking relatively rapid electrical activity** in the brain, in the order of milliseconds.

**What is the significance of EEG?**

- An EEG can be used to **help diagnose and monitor** a number of conditions affecting the brain.
- The main use of an **EEG is to detect and investigate epilepsy**, a condition that causes repeated seizures.
- In research, scientists use EEG for **neuroscience, cognitive psychology, neurolinguistics, and neuromarketing studies** and to develop brain-computer interfaces.
- An EEG might also be helpful for diagnosing or treating the following disorders:
  - **Brain tumor**
  - **Brain damage from head injury**
  - **Brain dysfunction that can have a variety of causes (encephalopathy)**
  - **Inflammation of the brain (encephalitis)**
  - **Stroke**
  - **Sleep disorders**

**Shortcomings of EEG:**

- EEG is biased towards **electrical signals** generated closer to the **surface of the cortex**, and significantly so towards **currents generated by neurons' dendrites** and against those **generated by the axons.**
- To overcome these and other challenges, researchers have used **EEG together with other tests**, like **magnetic resonance imaging (MRI)**, and have developed sophisticated **data acquisition, processing, and reconstruction methods.**

## Chandipura virus infection

**Subject: Science and tech**

**Sec: Health**

**Context:**

6 children die of suspected **Chandipura virus infection** in Gujarat: What is the **disease**, and what are its **symptoms?**

**More about News:**

- Several species of sandflies and some species of mosquitoes are known to transmit the infection. It can cause brain inflammation, leading to death in some cases.
- States where virus spread:
  - Sabarkantha, Aravalli, Mahisagar and Kheda districts of – Gujarat
  - Rajasthan
  - Madhya Pradesh
- A lot of **kutchha houses** also use **cowdung paint** or maybe making **cowdung cakes**, which in **turn attracts sandflies**.
- **Kutchha house:**
  - A Houses made of **mud and straw** are known as kutchha houses.

#### CHPV infection:

- **CHPV is a virus** of the **Rhabdoviridae** family.
- Other members such as the **lyssavirus** that **causes rabies**.
- Several species of **sandflies** like *Phlebotomine sandflies* and *Phlebotomus papatasi*, and some **mosquito species** such as *Aedes aegypti* (which is also **the vector for dengue**) are considered **vectors of CHPV**.

#### Rhabdoviridae virus:

- Rhabdoviridae is a family of **negative-strand RNA virus**.
- **Vertebrates**(including **mammals, humans**), **invertebrates, plants, fungi and protozoans** serve as natural
- Diseases associated with member viruses include **rabies encephalities** caused by the **rabies virus**, and **flu-like symptoms** in humans caused by
- The individual virus **particles (virions)** of **rhabdoviruses** are composed of **RNA, protein, carbohydrate and lipid**.

#### How is it transmitted?

- The virus **resides** in the **salivary gland** of these **insects**, and can be **transmitted to humans** or other **vertebrates** like **domestic animals** through **bites**.
- The **infection caused** by the **virus** can then **reach** the **central nervous system** which can lead to **encephalitis — inflammation of the active tissues of the brain**.

#### Symptoms of CHPV infection:

- **Initially with flu-like symptoms**.
- **Acute onset of fever**
- **Body ache**
- **Headache**
- It may then progress to altered **sensorium or seizures** and
- Other symptoms such as **respiratory distress, bleeding tendencies, or anaemia**.
- The infection often progresses **rapidly after encephalitis**, which may then lead to **mortality within 24-48 hours of hospitalisation**.
- **Susceptibility has largely remained limited to children below 15 years**.

#### How can the infection be managed?

- There is **no specific antiretroviral therapy or vaccine available for treatment**.
- Disease progression can be as rapid as a patient **reporting high fever** in the **morning**, and their **kidneys or liver** being **affected** by the **evening**. This makes it harder to manage the symptoms.

#### Prevention of CHPV infection:

- **Clean Surrounding:** Chandipura virus is mostly infected from **sand flies that breed over garbage, little and dirty areas**.
- **Avoid stagnation of water**.
- **Keep kids away from dustbins** in public spaces.

#### Which are the worst affected regions in India?

- The **CHPV infection** was **first isolated** in **1965** while investigating a **dengue/chikungunya outbreak in Maharashtra**.
- One of the **most significant outbreaks** of the disease in India was seen in **2003-04** in states such as **Maharashtra, northern Gujarat and Andhra Pradesh**.
- The infection has largely remained **endemic to the central part of India**, where the population of **CHPV infection-spreading sandflies and mosquitoes is higher**.

#### Measures taken by district authorities:

- The district authorities have deployed teams to conduct preventive measures like **dusting to kill sandflies** and **fumigation to kill insects and mosquitoes in affected areas** in order to **prevent** further spread of the virus.

#### Has the disease pattern changed over the years?

- There are **changes in patterns** being reported — **both** in the **disease manifestation** as well as the **vector**.
- The outbreaks are more pronounced because **sandflies multiply more** during the **monsoon season**.
- **Sandflies usually do not fly at a height more than 3 feet from the ground** but **this time** during surveillance, sandflies have been **found on terraces and higher heights**.
- Additionally **death with brain haemorrhages**, which is a **new presentation**.
- Cases are also suspected in other **tribal areas** such as **Pavagadh, Khedbrahma and Godhra**.

#### Tribal areas - Tribes

Pavagadh - Rathwa

Khedbrahma - Damor

Godhra - Godhra

#### India could soon allow 'game-changing' weight-loss drugs – Tirzepatide

**Subject: Science and tech**

**Sec: Health**

**Context:**

India approves 2 weight loss drugs — **Mounjaro and Zepbound**, and soon allow 'game-changing' **weight-loss drug tirzepatide**.

#### More about news:

- Indians can now avail the blockbuster weight loss and diabetes drug **Tirzepatide** — marketed as **Mounjaro and Zepbound in the US** and made by **Eli Lilly**.
- The **final approval** is expected to come from the **Drug-Controller General of India** based on this recommendation.
- Indians will be able to **access injectables** of this **class of drugs for the first time**, bringing hope to those **battling diabetes and obesity issues**.
- These can **reduce your body weight by up to 18 per cent**.
- The **oral version** of a weight loss drug made by **Eli Lilly's** Danish competitor **Novo Nordisk -Semaglutide** — has been **approved and is available in India for diabetes management**, its **higher dose, injectable version** meant for **weight-loss** isn't.
- **Mounjaro** addresses **diabetes** more while **Zepbound** targets **weight loss**.

#### Why experts cleared the drugs?

- The committee has approved the **import of single dose vials** and **pre-filled pens** of the injectable drug in **six different doses**, ranging from **5 mg to 12.5 mg**.
- This **nod** is based on **two global clinical trials**, which also included a significant number of Indians.
- In a **trial of adults without type 2 diabetes**, those on the **highest dose of Tirzepatide** lost an average of **18 per cent** of their **body weight in 72 weeks**.
- In a **trial** among those with **diabetes**, participants **lost** an average of **12 per cent** of their **body weight**.

#### Why Tirzepatide has an edge over semaglutide:

- **Semaglutide** belongs to a **class of drugs called GLP-1 receptor agonists**, which **lower serum glucose levels**.
- **Tirzepatide** mimics both the **GLP-1 hormone** and the **GIP hormone**.
- The latter can **trigger insulin creation** and **sensations of fullness**, thereby **increasing the chances of weight loss**.

#### Who can use the drugs?

- The **patients should** also be asked to **follow a diet and exercise**
- The drug should be prescribed only when they are able to **maintain the same weight** level or bring it down by adhering to it.

#### Who should not use these drugs?

- **History of pancreatic diseases**
- **Disorders of the endocrine systems**
- **Nausea**
- **Vomiting**

#### Side effects:

- **Nausea**

- **Diarrhoea**
- **Vomiting**
- **Constipation**
- **Abdominal pain**
- **Indigestion**
- **Injection-site reactions**
- **Fatigue**
- **Allergic reactions**
- **Hair loss**
- **Heartburn**

**High risk:**

- **Thyroid tumours**
- **Lump or swelling in the neck**
- **Hoarseness**
- **Trouble swallowing**
- **Shortness of breath**
- Individuals **cannot use Zepbound** if they, or any **family members**, have ever had **medullary thyroid carcinoma (MTC)**, a **type of thyroid cancer**, or **Multiple Endocrine Neoplasia syndrome type 2 (MEN 2)**, a rare **inherited disorder** that affects the **endocrine glands**.

**Are the drugs effective?**

- Dosage should follow only after the **patient has done lifestyle modifications** and is still hovering around the **body mass index (BMI) of 30**.
- These drugs may **help knock off the weight** initially but to **sustain the weight loss**.
- They **do not work the same way for all**.

**Affordability:**

- These are expected to **cost around Rs 15,000 a month**.
- **Long-term use** would be a **drain on the resources**.

**Are Zepbound and Mounjaro the same?**

- **Mounjaro and Zepbound** are **once-weekly injections** that contain the same active ingredient:
- Both brand names share **similar dosages, side effects, and drug interactions**.
- **Mounjaro** is **FDA approved for Type 2 diabetes** in
- **Zepbound** is **approved for chronic weight management in adults**

**Semaglutide vs tirzepatide:**

- The **FDA has approved Wegovy (semaglutide) and Zepbound (tirzepatide) for chronic weight management in adults**.
- These drugs can be prescribed to those who are **obese (with a body mass index of over 30)**, or **overweight (with a BMI between 27 and 30)**, and have at least one other health condition related to their weight (such as **high blood pressure, high cholesterol, or type 2 diabetes**).
- Semaglutide and tirzepatide are **polypeptides, small proteins** that boost the **levels of naturally-occurring hormones in the body**, including that of **glucagon-like-peptide 1 (GLP-1)**, which **control weight** through the **brain and digestive tract**.
- **Higher GLP-1 levels**, released in the **gut**, **spark a reaction** by **stimulating neurons** that **alter gut function**, leading to a **sense of fullness**.
- This process also taps into a **brain mechanism** that lights up **neural pathways**, **triggering the sensation of satiety** - the feeling of being satisfied and having had **enough to eat**.
- They also **help manage glucose levels**, making them an effective **treatment for diabetes**.
- Semaglutide only **targets GLP-1 receptors**. On the other hand, tirzepatide also boosts a **second hormone: glucose-dependent insulinotropic polypeptide (GIP)**.
- The GIP also regulates weight through receptors in brain and fat cells.



## Dip in India's childhood immunisation

**Subject: Science and tech**

**Sec: Health**

**Context:**

In absolute terms, **2.04 million children** remained **under-vaccinated** in **2023**, slightly lower than the 2.11 million children in 2019. The “**slight**” drop is a call to **intensify efforts**.

**More about News:**

- There was a **slight dip in childhood immunisation** in **2023** compared to **2022**, recently released **WHO and UNICEF** estimates of **national immunisation coverage (WUENIC)** revealed.
- There was a **two-percentage point dip (from 95% in 2022 to 93% in 2023)** in the coverage of the **diphtheria, pertussis, and tetanus (DPT) vaccine**, used as a proxy for the number of “**zero-dose**” children.

**What is a “zero-dose” children?**

- **Zero-dose children** are defined as those that **lack access to or are never reached by routine immunization services**. They are operationally measured as those who **did not receive their first dose of DTP**, a vaccine containing **diphtheria-tetanus-pertussis**.
- This number, however, was much **higher than the 87% and 88% DPT coverage** seen in **2020 and 2022** respectively, and **higher than the 2023 global average of 89%**.
- **WUENIC** shows that there were **6 million zero-dose children in India in 2023**, up from **1.1 million in 2022**, but much less than **2.73 million** seen in **2021**.

**What is Diphtheria, Tetanus, and Pertussis (DPT)?**

- **Diphtheria:**
  - **Caused by:**
    - Diphtheria is primarily caused by the **bacterium Corynebacterium diphtheriae**.
  - **Symptoms:**
    - **Common cold**
    - **Fever**
    - **Chills**
    - **Swollen gland in neck**
    - **Sore throat**
    - **Bluish skin**
  - **Spread:**
    - **Coughs and sneezes**
    - **Close contact** with someone infected.
  - **Target Population:**
    - Diphtheria particularly affects **children aged 1 to 5 years**.
    - Occurrence of diphtheria cases in **under-five children** reflects **low coverage of primary diphtheria vaccination**.
- **Tetanus:**
  - **Caused by:**
    - Through infection of a cut or wound with the spores of the **bacterium Clostridium tetani**, and most cases occur **within 14 days of infection**.
    - **Tetanus cannot be transmitted from person to person**.
  - **Prevention:**
    - Through **immunization with Tetanus-Toxoid-Containing Vaccines (TTCV)**.
  - **Symptoms:**
    - **Jaw cramping** or the inability to open the mouth.
    - **Muscle spasms** often in the back, abdomen and extremities.
    - **Seizures**.
- **Pertussis:**
  - **Caused by:**

- Pertussis, also known as **whooping cough**, is a **highly contagious respiratory infection** caused by the **bacterium *Bordetella pertussis***.
- The disease is **most dangerous in infants**, and is a significant cause of disease **and death in this age group**.
- **Spread:**
  - **From person to person mainly through droplets produced by coughing or sneezing.**

#### DPT vaccine:

- In **1978**, The DPT vaccine was introduced in India as a **routine immunization**, resulting in a **steady decline** in incidence in the **pediatric population**.
- The need for **two booster diphtheria vaccinations** and was included under **India's flagship immunization program – "Universal Immunisation Programme (UIP) "**, under **National Health Mission (NHM) , Ministry of Health & Family Welfare (MoHFW), Government of India.**

#### DPT Vaccine is for:

The DPT vaccine should be administered at the following ages:

##### Infant

- According to **UIP and NHM**, the **primary 3 doses of DPT** are given to **infants** as part of the **pentavalent vaccine** at **6, 10, and 14-week intervals**,

##### Children

- **Two other DPT booster doses** are then given by injection to children between **16-24 months and 6-7 years of age**.

##### Adult

- **Tdap** is given for **10 years** and thereafter **every 10 years**, although it is **not included in the UIP NHM program**.

### **Kerala issues technical guidelines for diagnosis, management of amoebic meningoencephalitis**

#### **Sub: Sci**

#### **Sec: Health**

#### **Context:**

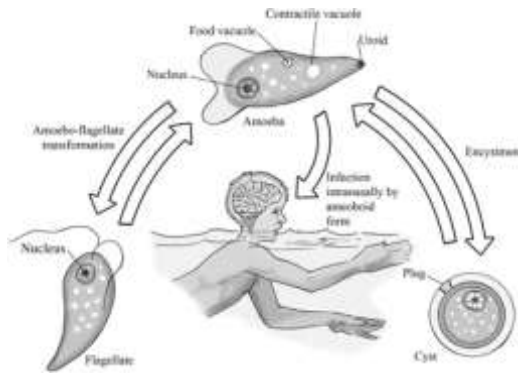
- **Kerala** has issued technical guidelines for diagnosis, **management of amoebic meningoencephalitis**.
- These guidelines/standard operating procedure (SOP) are to be followed by **all hospitals when dealing with cases of acute meningitis**.

#### **More on news:**

- **Five cases of Amoebic meningoencephalitis** have been reported in adolescents in the State in the past three months and with three young lives lost.
- These guidelines are possibly the **first set of guidelines in the country on amoebic meningoencephalitis** which is a **fatal infection**.

#### **What is amoebic meningoencephalitis?**

- Primary **Amoebic Meningoencephalitis (PAM)** is a rare but often fatal infection of the brain caused by the **amoeba *Naegleria fowleri***, commonly known as the "**brain-eating amoeba**."
- It is **non-communicable**.
- The causative agent is **Naegleria fowleri** which is a **free-living amoeba** typically found in **warm freshwater environments** such as lakes, rivers, hot springs, and poorly maintained swimming pools.
- The amoeba **enters the human body through the nose**, usually when people are swimming or diving in contaminated water.
- Once inside the nose, the **amoeba travels up the olfactory nerve to the brain**, where it causes severe inflammation and destruction of brain tissue.
- The disease progresses rapidly, often **leading to death within about 5 days after the onset of symptoms**.



#### What is the treatment for amoebic meningoencephalitis?

- Treatment includes **antimicrobial therapy** typically involving a **combination of drugs**, including **amphotericin B, rifampin, and miltefosine**, among others.
- The best drug regimen should include an **amebicidal drug (or a combination of drugs)** with good in vitro activity that is capable of crossing the **blood-brain barrier**.

#### What are the recommended SOP?

- A history of **nasal exposure to fresh water** in the **14 days before symptom onset** should be asked of any patient who presents with **symptoms of acute meningitis**.
- For patients with meningitis who have a history of recent nasal exposure to fresh water, the **cerebro-spinal fluid (CSF) specimen should undergo rapid testing for N. fowleri/FLA**.
- **All cases diagnosed as PAM through CSF microscopy** should be immediately initiated on the recommended multi-drug regimen and supportive therapy.
- **All cases of PAM should be treated by a multidisciplinary team comprising** physicians / pediatricians, intensivists, ID specialists, neurologists and microbiologists.

#### Children win with U-WIN, gov't's new online vaccine portal

**Subject: Sci**

**Sec: Health**

**Context:**

- On the government's 100-day health agenda is the countrywide rollout of U-WIN, an online vaccine management portal for childhood vaccination.

**More about News:**

- With **digitised and individualised immunisation records since birth**, the government hopes to **identify and reach the small proportion** of children currently outside its vaccine net.

**U-WIN:**

- **Children, up to the age of six years, and pregnant mothers are registered on U-WIN using government ID like Aadhaar, and their mobile phone numbers.**
- **Upon registration, records of all 25 shots given to a child — and the two given to pregnant mothers — can be added.**
- The platform generates a **checkered vaccination certificate** that **colour codes all vaccines**. After each shot is administered (and **recorded on U-WIN**), its date gets added to the card, which also shows the **due date for the next set of vaccines**, also **sends SMS reminders to parents before their children are due for the next dose**.
- **Digital vaccine certificate** — which can be **downloaded by parents using their registered mobile numbers** — does away with the **need to maintain the physical vaccination booklet**, and **allows one to get vaccinated anywhere in the country**.
- **To locate the nearest vaccination centre, and book an available slot.**
- As for **health workers**, the **platform can automatically generate a due-list of children in their respective areas**.
- Once the database matures, **U-WIN will allow the government to study micro-trends across areas**.
- **Registers all births, the three vaccines against polio, hepatitis B, and tuberculosis administered at birth, a child's birth weight, and any physical deformities observed at birth.**
- These data-points can be utilised by other government programmes as well — the idea is to **eventually connect all digital records through ABHA (Ayushman Bharat Health Account) ID**.
- **U-WIN will also be linked to the government's existing eVIN platform for inventory management. eVIN tracks all vaccine vials, from large central stores to each vaccination site in the country.**

- It keeps track of the **number of doses used, the number of doses that go to waste, and the number of open vials** that are submitted back by the sites, and is used by **sites to raise demands for vaccines.**

#### How will U-WIN help with immunisation?

- **Reminders that U-WIN will furnish to parents are likely to improve compliance.**
- **Ensure portability** — children who have received their **first vaccines in one village/city can receive the rest of the doses elsewhere in the country.** This will be especially useful to ensure that children of **migrant workers do not drop out.**
- The **portal might help reduce errors.**
- U-WIN will provide **granular, individualised details of childhood immunisation across the country.**

#### Budget provides customs duty exemptions for three cancer treatment drugs

**Subject: Sci**

**Sec: Health**

**Context:**

**Union government** has continued its emphasis on tackling **non-communicable diseases**, and **allocating funds for research in the healthcare sector**, with Finance Minister announcing customs duty exemptions on three cancer treatment drugs — **Trastuzumab Deruxtecan, Osimertinib, and Durvalumab.**

**More about News:**

- Changes in the **BCD (basic customs duty) on X-ray tubes and flat panel detectors** for use in **medical X-ray machines** under the phased **manufacturing programme.**
- Total outlay for the **health sector was ₹89,287 crore**, amounting to **85%** of the **budget expenditure, marginally up from 1.76%.**
- The government is also set to operationalise the **Anusandhan National Research Fund** for basic research and **prototype development.**

**Cancer drugs:**

The **three cancer drugs** namely **Trastuzumab Deruxtecan, Osimertinib and Durvalumab** are used for **different tumor types** viz:-

1. **Trastuzumab Deruxtecan - Breast Cancer**
  2. **Osimertinib - Lung Cancer**
- **Durvalumab - Lung Cancer and Biliary Tract Cancer**

**Trastuzumab Deruxtecan:**

- Trastuzumab is a type of **targeted cancer drug** called a **monoclonal antibody.**
- Targeted cancer drugs work by '**targeting**' those **differences that help a cancer cell to survive and grow.**
- It is a **treatment for cancers that have large amounts of a protein called human epidermal growth factor receptor 2 (HER2).**

**Osimertinib:**

- **To treat non-small cell lung cancer (NSCLC) in patients who have certain types of abnormal epidermal growth factor (EGFR) genes.**

**Durvalumab:**

- Durvalumab is used **alone or with other drugs to treat adults** with certain types of
- **Biliary tract cancer (including bile duct cancer and gallbladder cancer)**
- **Endometrial cancer**
- **Hepatocellular carcinoma (a type of liver cancer)**
- **Non-small cell lung cancer**

#### Cough syrup samples fail quality tests: central drug regulator's report

**Subject: Sci**

**Sec: Health**

**Context:**

The **CDSKO report** classified these batches as "**not of standard quality**" (NSQ) due to issues with **diethylene glycol (DEG), ethylene glycol (EG), assay, microbial growth, pH, and volume.** Some of these samples contained the **same toxins found in cough syrups linked to the deaths of children in Gambia, Uzbekistan, and Cameroon.**

**CDSKO:**

- **CDSCO is the Central Drug Authority** for discharging functions assigned to the Central Government under the **Drugs and Cosmetics Act, 1940**.
  - **Major functions of CDSCO:**
    - Regulatory control over the import of drugs
    - Approval of new drugs and clinical trials
    - Approval of certain licences as Central License Approving Authority.
  - **Ministry: Ministry of Health & Family Welfare**
  - **Statutory body**

- CDSCO is a statutory body established under the Drugs and Cosmetics Act, 1940 and is responsible for regulating the manufacture, sale, and distribution of drugs in India.

Ethylene Glycol and Diethylene Glycol:

- **Toxic alcohols with a slightly sweet taste.**
- **Contamination of cough syrups with these glycols** can occur, especially in products containing **paracetamol**.
  - **Paracetamol in cough syrups is good and safe for children** with infections. It is a **pain killer which is good at reducing fever**.
- **Diethylene glycol and ethylene glycol are adulterants** that are sometimes illegally used as solvents in liquid drugs as an alternative to non-toxic solvents such as **glycerine or propylene glycol to cut costs**.
  - Symptoms of contamination **may not appear until large amounts have been consumed**.
- Its use in **antifreeze, ethylene glycol is used as an ingredient in hydraulic fluids, printing inks, and paint solvents** and diethylene glycol is used in the commercial preparation of **antifreeze, brake fluid, cigarettes, and some dyes**.

What are the Risks Associated with Substandard Cough Syrups?

- **Presence of Harmful Substances:**
  - Substandard cough syrups may contain **high levels of diethylene glycol and ethylene glycol**, which can **damage the kidneys** and pose a serious health risk.
- **Unscientific Combinations:**
  - Unscientific combinations of **chemical components** that can interact with each other and potentially cause harm.
- **Lack of Therapeutic Relevance:**
- **Adverse Effects on Children:**
  - Certain cough syrups containing **codeine can be addictive and even lethal if given to children**. **Drowsiness, dizziness, blurred vision, nausea, and difficulty in verbalizing** can also be experienced, indicating potential harm.

**Regulations in India:**

**Drugs and Cosmetics Act, 1940:**

- **The Drugs and Cosmetics Act, 1940 and Rules 1945** have entrusted various responsibilities to central and state regulators for regulation of drugs and cosmetics.
- It provides the regulatory **guidelines for issuing licenses to manufacture Ayurvedic, Siddha, Unani medicines**.
- It is mandatory for the manufacturers to adhere to the prescribed requirements for licensing of manufacturing units & medicines including proof of safety & effectiveness, compliance with the **Good Manufacturing Practices (GMP)**.

**Drug used to treat clots can protect against cobra venom damage**

**Subject: Sci**

**Sec: Health**

**Context:**

- Researchers have found that **Tinzaparin** has significantly **reduced damage** to human cells due to **spitting cobra venom**.

**What is snake venom and how does it kill cells?**

- **Snake venom** is a **complex mixture of proteins, enzymes, peptides, and other bioactive molecules** produced by venomous snakes.

- **Peptides** found in venom include **cytotoxins, cardiotoxins, and neurotoxins**, which **target specific physiological systems** in prey.
- Once the toxins are injected, they can work in several ways depending on the type of snake and toxins like **hemotoxins, neurotoxins, myotoxins**.

#### How can blood thinners be an antidote?

- Using **CRISPR-Cas9 technique** researchers conferred that the genes were involved in facilitating the **venom's effects on normal human cells** and the resistance to spitting cobra venom had been conferred by the **absence of a gene**.
- Investigation revealed that **many of these genes** were involved in the **synthesis of a sugar compound called heparan sulfate**, which is known to **regulate the formation of blood vessels** and clots in the human body.
- The researchers hypothesize that **if the venom's toxicity depended** on the biological pathway that synthesized heparan sulfate, **artificially stopping this pathway** could **ameliorate the venom's toxic effects**.
- One way of doing so is to introduce **molecules that closely resemble heparan sulfate** ex **tinzaparin, a drug used to treat serious blood clots**.
- As the body **senses an excess of these molecules**, it **shuts down the pathways** responsible for **heparan sulfate synthesis**.
- Researchers **introduced tinzaparin immediately** after subjecting cells to the snake venom, the **cells survived**.
- Tinzaparin could protect these cells even when it was introduced an hour after the cells had been exposed to the venom.
- Further experiments revealed that **tinzaparin worked by blocking the interaction between the venom and its receptor** in the cell **by binding to venom molecules**.

#### WHO sees 'high risk' of polio virus spreading across Gaza, assessment underway

**Subject: Science and tech**

**Sec: Health**

**Context:**

**Circulating vaccine-derived poliovirus type 2** had been isolated from environmental samples from sewage, in war-ravaged Gaza.

**More about News:**

- There is a **high risk of spreading of the circulating vaccine-derived polio virus** in Gaza, not only because of the detection but because of the **very dire situation with the water sanitation**.
- **Poliomyelitis**, which is spread mainly through the **fecal-oral route**, is a **highly infectious virus** that can **invade the nervous system and cause paralysis**. It mainly affects children under the age of 5.
- Without proper health services, the **population of Gaza** is particularly vulnerable to outbreaks of disease.

**Circulating vaccine-derived polio virus:**

**Wild poliovirus (WPV)** is the most commonly known form of the **poliovirus**. However, there is another form of polio that **can spread within communities: circulating vaccine-derived poliovirus, or cVDPV**.

- **Transmitted from :**
  - **Person-to-person**
  - **Mainly through the fecal-oral route or, less frequently**
  - **By contaminated water or food**
- The **virus multiplies in the intestine**, from where it can **invade the nervous system and cause paralysis**.

**Incubation period :** Usually 7-10 days but can range from 4-35 days.

- **Up to 90%** of those infected are either **asymptomatic or experience mild symptoms** and the disease usually goes **unrecognized**.
- **Vaccine-derived poliovirus** is a well-documented strain of poliovirus mutated from the strain originally contained in **OPV**.
- **OPV** contains a **live, weakened form of poliovirus** that **replicates in the intestine for a limited period**, thereby **developing immunity by building up antibodies**.
- On rare occasions, **when replicating in the gastrointestinal tract**, **OPV strains can genetically change and may spread in communities that are not fully vaccinated against polio**, especially in areas where there is **poor hygiene, poor sanitation, or overcrowding**.
- The **lower the population's immunity**, the **longer vaccine-derived poliovirus survives and the more genetic changes it undergoes**.
- The vaccine-derived virus can **genetically change into a form that can cause paralysis** as does the wild poliovirus – this is what is known as a **vaccine-derived poliovirus (VDPV)**.



To comply with the **Temporary Recommendations issued under the PHEIC**, any country that have had an importation of cVDPV2 with local transmission should

- **Declare the outbreak as a national public health emergency.**
- **Encourage residents and long-term visitors to receive a dose of IPV four weeks to 12 months prior to international travel.**
- Ensure that travellers who receive such vaccination have **access to an appropriate document to record their polio vaccination status.**
- Further **intensify efforts to increase IPV immunization coverage**, including sharing coverage data.
- Intensify **regional cooperation and cross border coordination** to enhance surveillance for prompt detection of poliovirus, and vaccinate refugees, **travellers and cross border populations**, according to the advice of the Advisory Group.

### **ICMR ready to transfer technology for commercialisation of TB detection kit**

**Subject: Science and Tech**

**Sec: Health**

**Context:**

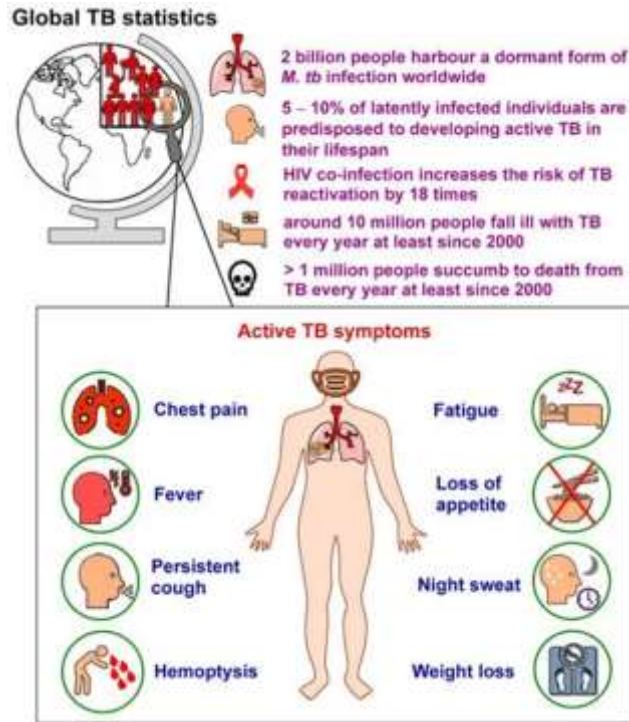
- **Indian Council of Medical Research (ICMR)** has begun work on bringing **in affordable, faster and easy-to-use testing technology for detection of tuberculosis (TB)**.The Council has invited **Expressions of Interest (EOI)** from organisations, companies, and manufacturers for undertaking **‘Transfer of Technology’** for the commercialisation of A **CRISPR Cas based TB detection system for the detection of Mycobacterium TB.**

**More on News:**

- Developed by **ICMR- RMRCNE Institute, Dibrugarh** the technology is touted as the **“world’s cheapest TB testing system”**.
- The system can detect the TB bacteria using DNA from a patient’s saliva for a very low cost, can identify the bacteria with preliminary symptoms, and test over 1,500 samples simultaneously within approximately two hours.**ICMR-RMRCNE Institute would accelerate the development of the product and its commercialization.**
- ICMR would provide technical support through its team of experienced scientists in **study planning, product development, development of study protocol, results/data analysis, outcome assessment, safety & efficacy assessment, product improvement, etc.**

**Tuberculosis:**

- - **Tuberculosis is a bacterial infection caused by Mycobacterium tuberculosis.**
  - **Affect any organ of the body.**
  - **The most common ones are the lungs, pleura (lining around the lungs), lymph nodes, intestines, spine, and brain.**
- **Transmission:**
  - It is an **airborne infection** that spreads through **close contact with the infected, especially in densely populated spaces with poor ventilation.**
- **Symptoms:**
  - **Cough with sputum**
  - **Blood at times**
  - **Chest pains**
  - **Weakness**
  - **Weight loss**
  - **Fever**
  - **Night sweats.**



- **Treatment:**

- **Standard 6-month course of 4 antimicrobial drugs** that are provided with information, supervision and support to the patient by a health worker or trained volunteer.
- **Anti-TB medicines** have been used for decades and strains that **are resistant to 1 or more of the medicines** have been documented in every country surveyed.
  - **Multidrug-resistant Tuberculosis (MDR-TB)** is a form of TB caused by bacteria that **do not respond to isoniazid and rifampicin**, the 2 most powerful, first-line anti-TB drugs.
    - **MDR-TB is treatable and curable by using second-line drugs such as bedaquiline.**
  - **Extensively drug-resistant TB (XDR-TB)** is a more serious form of MDR-TB caused by bacteria that do not respond to the most effective second-line anti-TB drugs, often leaving patients without any further treatment options.

- **Drugs for TB:**

- **Isoniazid (INH):** This drug is a **cornerstone of TB treatment and is highly effective against Mycobacterium tuberculosis.**
  - **It works by inhibiting the synthesis of mycolic acids in the bacterial cell wall.**
- **Rifampicin (RIF):** Works by **inhibiting the synthesis of RNA in the bacteria.**
  - It is often used in **combination with other drugs to treat TB and is crucial for preventing the development of drug resistance.**
- **Delamanid:** Newer drug that is used in the treatment of **multidrug-resistant TB (MDR-TB)** and is often used in **combination with other drugs.**

**CRISPR Technology:**

- **About:**

- **Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR)** is a gene editing technology, which **replicates natural defence mechanism in bacteria to fight virus attacks, using a special protein called Cas9.**
- It usually involves the **introduction of a new gene, or suppression of an existing gene**, through a process described as genetic engineering.
  - **CRISPR technology does not involve the introduction of any new gene from the outside.**
- **CRISPR-Cas9 technology** is often described as ‘**Genetic Scissors**’.
  - Its mechanism is often compared to the ‘**cut-copy-paste**’, or ‘**find-replace**’ functionalities in common computer programmes.
  - A **bad stretch** in the DNA sequence, which is the cause of disease or disorder, is **located, cut, and removed and then replaced with a ‘correct’ sequence.**
    - The tools used to achieve this are biochemical i.e., specific protein and RNA molecules.

- The technology **replicates a natural defence mechanism in some bacteria** that uses a similar method to **protect itself from virus attacks**.
- **Mechanism:**
  - The first task is to **identify the particular sequence of genes that is the cause of the trouble**.
  - Once that is done, an **RNA molecule is programmed to locate this sequence on the DNA strand**, just like the 'find' or 'search' function on a computer.
  - After this **Cas9 is used to break the DNA strand at specific points, and remove the bad sequence**.
  - A DNA strand, when broken, has a **natural tendency to re-attach and heal itself**. But if the auto-repair mechanism is allowed to continue, the bad sequence can regrow.
    - So, **scientists intervene during the auto-repair process by supplying the correct sequence of genetic codes**, which attaches to the broken DNA strand.
      - It is like cutting out the damaged part of a long zipper, and replacing it with a normally functioning part.
  - The **entire process is programmable**, and has remarkable efficiency, though **the chances of error are not entirely ruled out**.

## Kerala breaks free from centralized testing, sequencing

**Sub: Sci**

**Sec: Health**

**Context:**

- On July 20, the **Thiruvananthapuram-based Institute of Advanced Virology** tested the Nipah virus sample in four hours and conveyed the result to the State government.

**Institute of Advanced Virology, Kerala:**

- **The Institute of Advanced Virology (IAV)** has been established by the Government of Kerala through **Kerala Biotechnology Commission (KBC)** of Kerala State Council for Science Technology and Environment (KSCSTE) in the wake of the **2018 Nipah virus outbreak in Kerala**.
- The Institute will **strengthen epidemic preparedness, rapid response** and risk communication to the public apart from the high-end research in the area of basic as well as **translational virology**.
- The Institute shall have the **biosafety level** measures to handle **high-risk viruses (Biosafety Level 3 initially and eventually to Level 4)**.
- The Institute has for the **first time** carried out **partial sequencing of the Nipah virus genome**.

**What is Genome sequencing?**

- **Genome sequencing** is the process of determining the **entirety, or nearly the entirety, of the DNA sequence of an organism's genome at a single time**.
- The **first virus to have its complete genome sequenced** was the **Bacteriophage MS2 by 1976**.
- Genome sequencing is performed through 4 main steps:
  - **DNA shearing:** Scientists begin by using **molecular scissors to cut the DNA**, which is composed of millions of bases (**A, C, T, and G**), into pieces that are small enough for the sequencing machine to read.
  - **DNA barcoding:** Scientists add **small pieces of DNA tags, or bar codes, to identify which piece of sheared DNA** belongs to which bacteria. This is similar to how a bar code identifies a product at a grocery store.
  - **DNA sequencing:** The **bar-coded DNA from multiple bacteria** is combined and put in a DNA sequences. The sequencer **identifies the A, C, T, and G**, or bases, that make up each bacterial sequence. The sequencer uses the bar code to keep track of which bases belong to which bacteria.
  - **Data analysis:** Scientists use **computer analysis tools to compare sequences from multiple bacteria and identify differences**. The number of differences can tell the scientists how closely related the bacteria are, and how likely it is that they are part of the same outbreak.
- **Whole genome sequencing should not be confused with DNA profiling**, which **only determines the likelihood that genetic material came from a particular individual or group**, and does not contain additional information on genetic relationships, origin or susceptibility to specific diseases

## Why and when are puberty blockers prescribed

**Sub: Sci**

**Sec: Health**

**Context:**

- Tesla and SpaceX CEO **Elon Musk** has alleged that his **transgender child** was (figuratively) “killed by the **woke mind virus**” after he was “tricked” into **consenting to the use of “puberty blockers**.”

#### What are puberty blockers?

- **Puberty blockers are drugs** that can delay the changes of puberty in **transgender and gender-diverse teens**.
- **During puberty**, a child’s body goes through physical changes in the **process of becoming an adult capable of sexual reproduction**.
- When a teen has **gender dysphoria**, a condition in which they are conflicted between the gender assigned at birth and the gender they want to assume, then the puberty blockers are prescribed to pause sex hormones.
- Puberty blockers are **administered in a dose given monthly**, or every **three months**, or every **six months**.
- The most common puberty blockers include: **Goserelin (Zoladex) Histrelin (Supprelin LA) Leuprolide (Lupron Depot-Ped, Fensolvi)**

#### How do these drugs work?

- The medicines are called **gonadotropin-releasing hormone (GnRH) analogues**, which **stop the body from making sex hormones**.
- In people **assigned male at birth**, these **slow the growth of facial and body hair**, prevent voice deepening, and limit the growth of the penis, scrotum, and testicles.
- In people assigned female at birth, the **drugs limit or stop breast development**, and stop menstruation.
- Puberty blockers are also **used in cases of precocious puberty**, a condition in which a **child’s body begins changing too soon**, before the age of eight for girls and before the age of nine in boys
- **In India puberty blockers** are prescribed mostly for **precocious puberty in India**.

#### What are side effects associated with Puberty blockers?

- Side effects include **insomnia, weight gain, muscle aches, fatigue, mood shifts, changes in breast tissue, and irregular periods or spotting in women**.
- They may also **cause depression** or self-harm tendencies.

**Athletes worldwide turn to genetic screening for improved performance. Experts, though, caution against over-reliance on this emerging science**

**Subject: Sci**

**Sec: Health**

**Context:**

After winning **seven gold medals** in **Commonwealth Games**, 41-year-old table tennis player **Sharath Kamal** **left no stone unturned** in his preparations for **the 2024 Paris Olympics**, which began on July 26.

**More on News:**

- **Genetic screening, an emerging science** that is **becoming popular among sportspersons**.
- The tests informed of **food allergies and the minerals and vitamins his body needed**.
- In **2017**, the **Board of Control for Cricket in India** reportedly introduced **genetic testing** to help the **Indian men’s cricket team improve speed, fat-burning, endurance, recovery time and muscle-building**.
- These tests were **introduced in India around 2011**.

**Genetic test:**

- Genetic tests, initially used for **detecting diseases or predispositions**, entered the **sporting world in the late 1990s**, when scientists began to gather evidence that **genes influence** various aspects of **athletic performance, including endurance, flexibility and psychological traits**.
- **Genetic tests read instructions stored in deoxyribonucleic acid (DNA)**, a **two-metre-long molecule present in our cells**.
- The code in our **DNA maintains our bodies’ functions, determines our appearance and influences our likelihood of developing certain diseases**.
- **Genetic data consists of four letters or chemicals—Adenine, Guanine, Cytosine and Thymine—repeated in specific sequences**.
- These sequences are read by **cellular machinery to create amino acids, the building blocks of proteins**.
- Some athletes have won the **genetic lottery, prompting scientists to probe the role of genes in athletic prowess**.
- Scientists study **genetic variants**, which are differences that arise from **mutations in specific DNA sequences**.
- These **mutations contribute to unique athletic characteristics and traits**.

## Decoding DNA

- **Fifty years after the structure of DNA was first decoded**, former US President Bill Clinton and former British Prime Minister Tony Blair announced a significant scientific achievement in 2000: the **initial sequencing of the human genome as part of the Human Genome Project, launched in October 1990.**
- Within 24 hours of this announcement, the information was made publicly available, allowing **scientists worldwide to begin decoding the mysteries of human biology**
- **In 1998, angiotensin-converting enzyme (ACE) gene, involved in the control of blood pressure and skeletal muscle function, first captured scientists' attention.**
- **A 2002 study that a variant of this gene, ACE-I, was linked to endurance performance, giving runners, rowers and mountaineers an edge over others.** The study found another variant, **ACE-D, associated with strength gain, essential for weightlifting.**
- Another gene linked to sports performance is **alpha-actinin 3 (ACTN3)**. This gene produces the **ACTN3 protein found in skeletal muscle tissue, particularly in type 2 or "fast-twitch" muscle fibres.** These fibres are known for **generating short, powerful movements.**
- **Lactose intolerant: These tests can also identify specific food allergies and recommend dietary adjustments to improve performance.**

## Spiral galaxies evolved 4 billion years sooner than expected

**Sub: Science and tech**

**Sec: Space**

**Context:**

- A new study has revealed more **spiral galaxies** in the universe's youth than astronomers had expected.

**More on news:**

- The **universe is about 13.8 billion years old** and is home to different kinds of galaxies, **from spiral to elliptical** and those with or without bulges.
- While the universe's **younger galaxies have tended to spiral**, the older ones have a variety of shapes.
- **Studying the older galaxies is more difficult** because the **light from them is fainter.**

**Seeing further into the past:**

- The first step is to use light of the infrared and optical wavelengths to detect galaxies in the early universe.
- Since older galaxies are harder to detect, **powerful telescopes were required.**
- Ideally, astronomers would like to observe light emitted when the universe was around 500 million years old, when the galaxies were thought to be forming.
- **NASA's James Webb Space Telescope**, launched in 2021, has helped astronomers gaze much deeper into the universe's past than before.
- Some of them dated to 1.5 billion years after the universe's birth.

## Even short trips to space can change an astronaut's biology — a new set of studies offers the most comprehensive look at spaceflight health since NASA's Twins Study.

**Sub: Science and tech**

**Sec: Space sector**

**Context:**

- New research uses twins to discover how one year on board the **International Space Station affects the human body.**

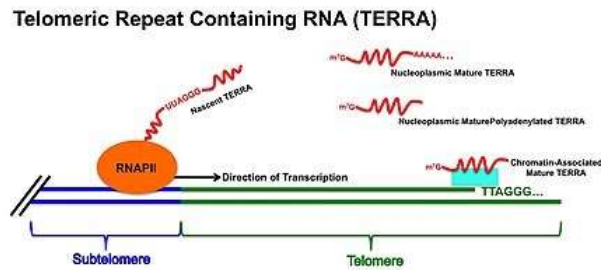
**What is NASA Twins Study?**

- **NASA selected astronaut Scott Kelly for a one-year mission**, during which he spent a year on board the International Space Station from 2015 into 2016.
- Over the same time period, **his identical twin brother, Mark Kelly,** remained on Earth.
- While examining blood samples of both astronauts it was found that the **telomeres of Scott in space increased in length and got quickly shortened** when he returned to earth and **overall astronauts had shorter telomeres after spaceflight than they did before.**
- **With age telomeres get shortened** because of a variety of factors, **including stress.**
- The **length of telomeres** can serve as a **biological indicator of** the risk for developing age-related conditions such as **dementia, cardiovascular disease and cancer.**



- During studies made on the **Inspiration4 mission that lasted only three days**, it was found that **even short trips**, like a weekend getaway to space, **will lead to changes in telomere length**.
- A similar study conducted on high-altitude mountain climbers found that while climbing Mount Everest, **the climbers' telomeres were longer** and after they descended, **their telomeres shortened**.

#### Telomeric RNA:



- **Telomeric repeat-containing RNA (TERRA)** is a long **non-coding RNA** transcribed from **telomeres - repetitive nucleotide regions** found on the **ends of chromosomes** that **function to protect DNA from deterioration or fusion** with neighboring chromosomes.
- Studies on various astronauts suggested **increased levels of telomeric RNA, termed TERRA**.
- **Telomerase is an enzyme that maintains telomere length**.
- **Together with laboratory studies, various findings tell us that telomeres are being damaged during spaceflight**.

#### Why do telomeres length changes in space?

- **Telomeres** are sensitive to **oxidative stress**.
- The **chronic oxidative damage** that astronauts experience when **exposed to space radiation** around the clock likely contributes to the **telomeric changed length**.

#### What is oxidative stress?

- **Oxidative stress** is an imbalance of **free radicals and antioxidants** in your body that **leads to cell damage**.
- It **plays a role** in many conditions like **cancer, Alzheimer's disease and heart disease**.
- **Toxins like pollution and cigarette smoke** can cause oxidative stress, while foods rich in **antioxidants can help reduce it**.

#### Plant telomeres in space:

- As per the study published in **Nature Communications**, unlike people, **plants flown in space did not have longer telomeres** during their time on board the International Space Station.

The plants did, however, **ramp up their production of telomerase**, the enzyme that helps maintain telomere length.

#### What is Aphelion?

**Sub: Science and tech**

**Sec: Space sector**

**Context:**

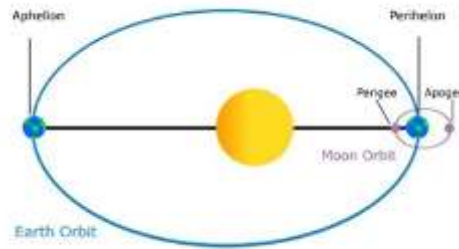
- **Earth had reached aphelion on 5th July** which is the **farthest distance from the Sun**.

#### About Aphelion:

- **Aphelion, in astronomy**, the **point in the orbit of a planet, comet, or other body most distant from the Sun**.
- When Earth is at its aphelion in early July, it is about **4,800,000 km farther from the Sun**.
- Earth reaches **aphelion every July**.
- That Earth has an aphelion is a **result of its orbit being elliptical, rather than circular**.
- **All planets in the solar system travel in elongated circles** around the Sun, rather than perfect ones.
- **Jupiter exerts the most influence because it is the most massive planet** in our solar system.
- The **higher the eccentricity, the more elliptical the orbit** (Earth's eccentricity is **0.017**).

**How far is the Earth from the Sun at aphelion?**





- **Aphelion** refers to the point in **Earth's orbit** when it is **farthest from the Sun**, occurring around **July 4** each year.
- At **aphelion**, Earth's distance from the Sun is about **152.1 million km**.
- On **January 3rd**, Earth is **closest to the sun** and the distance is around **147.5 million Kilometers**. This is called **Perihelion**.

#### Does aphelion affect temperatures on Earth?

- A common **misconception** is that **Earth's varying distance from the Sun** is what **gives rise to the seasons**.
- We get **7% less sunlight** at **aphelion** compared to what we are exposed to at **perihelion**, leading to slightly **milder summers and winters in the Northern Hemisphere**.
- This effect is offset by **Earth's tilt on its axis** at **different points along its orbit**.

#### What would happen if there were no aphelion?

- If our planetary orbit were a perfect circle, the **seasons' lengths would be exactly the same**.
- Currently, **spring and summer are a few days longer than fall and winter in the Northern Hemisphere**. But not much else would change.
- But if something made **Earth's orbit grow more eccentric**, the consequences could be **catastrophic**.
- **Seasons in the Southern Hemisphere would become too extreme** — summers would be unbearably hot, and winters would be intolerably cold.
- This could lead to **crop failures and freezes**.

#### What is Perihelion:

- The term "**perihelion**" refers to the **point in the orbit of a planet** or other astronomical body, at which it is **closest to the sun**.
- The word comes from Greek and literally means around (peri) the sun (helios).

#### ISRO's plans to venture into planetary defense.

**Sub : Science and tech**

**Sec: Space**

**Context:**

- **Indian Space Research Organisation (ISRO)** Chairman S Somanath said last week that "**we should be able to go and meet**" the **asteroid Apophis** when it passes by **Earth at a distance of 32,000 km in 2029**.

#### What is Apophis?

- **99942 Apophis** is a **near-Earth asteroid** and a potentially hazardous object with a **diameter of 450 meters at its widest**, that caused a brief period of concern in December 2004 when initial observations indicated a probability up to **7%** that it would **hit Earth on April 13, 2029**.
- Some scientists compared the **potential impact** to the event that **wiped out dinosaurs** and most other extant life some **66 million years ago**.

#### What are the possible incoming threats from space?

- **Earth's gravity attracts** more than a **hundred tons** (more than 90 metric tons) of **small objects and dust from space daily**, according to NASA.
- **Most of this material burns up in the atmosphere without any effect on the planet**.
- **Asteroids of 1 kilometer [0.62 miles] in size or larger** have the potential of **causing a global disaster** if they were to hit the Earth.
- While **no known comet represents an impact threat** for the foreseeable future, comet impacts are possible, albeit extremely rare.

#### What factors affect whether an object is considered a threat to Earth?

- The **two main factors** are the **object's orbit and its size**.
- If the **trajectory of the object has no chance** of intersecting Earth, then it's not a threat and **we need to consider its size**.
- **Small impactors of a few meters in size** or less will **disintegrate in the atmosphere** and cause no damage to the ground.
- Objects of tens of meters in size could cause localized damage, **100 meters or more regional scale damage, and 1 km or more global damage**.

#### What is a Planetary Defence System?

- **Planetary defense** is the **effort to monitor and protect Earth from asteroids, comets and other objects** in space.
- In 2022, NASA demonstrated technology that has long been a science fiction staple.
- A spacecraft launched in the previous year **crashed into an asteroid named Dimorphos, and changed both its shape and its trajectory**.
- **Dimorphos did not pose a threat to Earth**, and was circling the Sun some 11 million km away from our planet. But this showed the **beginning of a planetary defense programme**.
- NASA has already redirected one of its **spacecraft, one that** previously studied the **asteroid Bennu, to track Apophis**.

#### NASA's CHAPEA project: Why 4 people spent a year in an airlocked space simulating Mars

**Subject: Science and tech**

**Sub: Space sector**

**Context:**

- NASA's simulation mission saw four volunteers **live in a habitat built to replicate conditions on Mars, seen as the most hospitable planet to support life after Earth**.
- **More About the News:**
- A part of NASA's **Crew Health and Performance Exploration Analog (CHAPEA) project**, it was the **first of three planned simulations** to understand the challenges **Mars poses for space explorers**.
- A **3D printed airlocked habitat of 1,700 sq feet** was created and set up at the **Johnson Space Center in Houston, Texas, dubbed "Mars Dune Alpha"**. It included **four bedrooms, two bathrooms, a work area, a robot station, a gym, common sandy areas with various instruments, and a vertical farm**.
- Simulated **Martian soil** and a **backdrop of red, rocky cliffs** were provided for an immersive experience. The additional 1,200 sq ft space, adjoining the **Mars Dune, Alpha** was used for extravehicular activities typically done by astronauts outside their spacecraft.
- The crew entered the simulated space on **June 25, 2023**, and emerged after **378 days**.

#### Mission's Aim:

- NASA aimed to **collect data** for insight into "the **potential impacts of long-duration missions to Mars on crew health and performance**" and "understand and counter the physical and mental challenges astronauts will face".
- The data will also help the agency prepare for **long-term presence on the Moon** as part of its **Artemis programme**, seen as another step towards an **expedition to Mars**.
- "**Mars remains our horizon goal for human exploration** because it is one of the only other places we know where life may have existed in the solar system.
- The **first CHAPEA mission** focused on **nutrition, and the next two are planned for 2025 and 2026**. NASA hopes to send astronauts to Mars by the 2030s.

#### Participants in the Mars Simulation Mission:

- The **four volunteers** included **Kelly Haston, the team leader** and a **research scientist; Anca Selariu, a US Navy microbiologist; Ross Brockwell, a structural engineer; and Nathan Jones, an emergency medicine physician**.

#### Habitat like on Mars:

- The **temperature** on Mars ranges between **20 degrees Celsius and -153 degrees Celsius**. The planet has a **rocky surface with canyons, volcanoes, dry lake beds, and craters, all covered in red dust**.
- Winds can create **dust storms**. They are visible from Earth using telescopes. It has about **one-third the gravity of Earth** and the **atmosphere is much thinner than Earth's**, containing more than **95% carbon dioxide** and **less than 1% oxygen**.
- The **planet turns on its axis more slowly than Earth**, and being **farther from the Sun**, takes **longer to revolve** around the Sun. A **day on Mars is 24.6 hours** and a year is **687 Earth days**

#### Challenges involved in a mission to Mars:

- The long duration of a Mars mission because even a **one-way trip** would take **six to nine months**

- Mars's **thin atmosphere** also makes it difficult to slow down a spacecraft for a safe and **precise landing**.

#### India's plans for a Mars mission:

- **ISRO** is preparing for **astronomy missions and exploratory missions** to the **Sun, Mars and Venus** in the next few years.
- In **2014, India** tasted **success** with its **Mars Orbiter Mission (MOM) or Mangalyaan**, becoming the **first nation to reach Martian orbit in its first attempt**.

### Nobel laureate supports India's pursuit for a neutrino lab

#### Subject: Science and tech

#### Sec: Space sector

#### Context:

Nobel laureate Takaaki Kajita opens up about the parallels and contrasts between Japan and India's quests to further research on enigmatic elementary particles called neutrinos.

#### More About News:

- About **60 years ago**, historic science experiments inside a **goldmine in Kolar, Karnataka**, would lead to the **1965 discovery of atmospheric neutrinos**. This was a collaboration between **Indian, Japanese and British scientists**.
- **Japan continued** with experiments on or rather, under their soil, in the underground **Kamioka Observatory** situated under **Mount Ikeno**. This was where **Masatoshi Koshiba's team** would discover **cosmic neutrinos** in the late
- Japan established a dedicated neutrino observatory, **Super-Kamiokande**, which began **operation in 1996**. In **2002, Koshiba** won a **Nobel Prize for his contributions**.
- A proposal was drawn and in **2011**, the **Indian government** announced its intention to set aside about **1,350 crores** for an **India-based Neutrino Observatory**, which would be situated **1.3 km underground** in **Tamil Nadu**. Over a decade later, there has been no progress.
- Japanese researchers received the **first evidence** for a **phenomenon** called **neutrino oscillation** within a year of the **Super-Kamiokande**. This discovery would go on to (jointly) win **Koshiba's student Takaaki Kajita, another Nobel in 2015**.

#### Two of the main reasons for opposition to INO:

1. **Environmental impacts:** The observatory would be located a kilometre underground and hence would have **minimal impact on wildlife and the ecosystem**.
2. **Fear of radioactivity**

#### What about radioactivity?

- The experiment will **neither produce any radioactivity nor can it function** well where there is radiation.
- The whole point of **housing the detector underground** is to protect it from the **natural radiation that hits the surface of Earth**.
- The original experiment was designed to search **not for neutrinos** but for a **hypothetical phenomenon** called **proton decay**.
- The biggest stroke of luck for the Japanese neutrino scientists was the **timing of a supernova** that was **observed in February 1987**.
- The **Supernova 1987A** happened while the **Kamiokande-II detector** was online, leading to the discovery of **cosmic neutrinos** by the team led by Koshiba. This had a great impact.
- A neutrino observatory at home is envisioned to give the **Indian scientific community**, including students of particle physics, the opportunity to work with a **world-class detector without needing to travel outside national borders**.
- **INO dream is worth salvaging**.

#### What is a neutrino?

- Neutrinos are the **smallest particles** that form the universe.
- Neutrinos which are elementary particles have **no charge and almost no mass** and therefore do not affect anything they pass through.
- They are **naturally produced in the atmosphere** of the Earth and are present around us at all times, causing no damage.

#### About Indian Neutrino Observatory:

- INO Project is a multi-institutional effort aimed at building a world-class underground laboratory with a rock cover of approx. 1200 m for non-accelerator based high energy and nuclear physics research in India.
- The proposed site is spread across **Kerala and Tamil Nadu**.
- It is **funded by Dept. of Atomic Energy (DAE) and the Dept. of Science and Technology (DST)**.

- **Objectives:** INO will observe neutrinos and antineutrinos produced in the atmosphere of the Earth.
  - This observation will tell us more about the properties of neutrino particles, whose main source is the Sun and the Earth's atmosphere.
- **The project includes:**
  - Underground laboratory and associated surface facilities at Bodi West Hills.
  - Construction of a magnetized Iron Calorimeter (ICAL) detector for studying neutrinos. When completed, ICAL will have the world's largest magnet.
  - Setting up Inter Institutional Centre for High Energy Physics (IICHEP) at Madurai

#### What's special about locating the INO in the South?

- A project report says most of the neutrino detectors are at latitudes over 35 deg.
- It is possible to push such a detector down to almost 8 deg latitude in South India, **within proximity to the Equator.**
- This **permits neutrino astronomy searches covering the whole celestial sky and study of solar neutrinos passing through the Earth's core.**

#### Periyar Tiger Reserve:

- It falls in the districts of Idukki and Pathanamthitta in Kerala (southern region of Western Ghats).
- Declared a Sanctuary during 1950 and Tiger Reserve in 1978.
- It gets its name from the River Periyar which has its origin deep inside the reserve.

#### Mathikettan Shola National Park:

- Mathikettan Shola National Park is a national park in Poopara village in **Idukki district of Kerala.**
- Considering the unique nature of the shola forest in Mathikettan and its importance as an elephant strip, the state government has declared it as a National park in 2008.

#### What caused the rare failure of SpaceX's Falcon 9 rocket

**Subject: Science and tech**

**Sec: Space sector**

**Context:**

The US Federal Aviation Administration (FAA) grounded SpaceX's Falcon 9 — one of the **world's most active rockets** — **after the failure of its upper stage engine** that stranded **20 Starlink internet satellites** in a low, non-survivable orbit. The mishap occurred on the rocket's 354th mission, and marks the first Falcon 9 failure since 2015

#### What is Falcon 9?

- Falcon 9 is a **partially reusable rocket** designed and **manufactured by Elon Musk-owned SpaceX.** It can transport **crew and payloads to low Earth orbit (an altitude of 2000 km or less) and beyond.**
- The rocket has **two stages.** The **first stage or booster stage** comprises **nine Merlin engines (a family of rocket engines developed by SpaceX),** and **aluminium-lithium alloy tanks** containing **liquid oxygen and rocket-grade kerosene propellant.** The **second stage** consists of a **single Merlin engine.**
- The **first stage,** which is **reusable,** is capable of **re-entering the atmosphere,** and landing **vertically** after separating from the **second stage.**

#### What went wrong with Falcon 9?

- The issue occurred **roughly 30 minutes** after the **launch of Falcon 9** from the **Vandenberg Space Force Base in California.**
- The rocket's **second stage** experienced a **liquid oxygen leak,** and **failed to complete a second, short engine burn** needed to put **20 Starlink satellites** in the correct orbit.
- "Although the stage survived and still **deployed the satellites,** it did not successfully circularise its orbit. This left the satellites in an **eccentric orbit** with a **very low perigee of 135 kilometres (84 miles),** which is **less than half the expected perigee altitude.**"
- The mishap occurred on the **rocket's 354th mission,** and marks the **first Falcon 9 failure** since **2015,** when the **rocket exploded** on a launch site in Falcon 9 is considered one of the most **successful and reliable rockets** ever made.

#### What happens next?

- The rare failure is expected to impede Falcon 9's launch pace. In 2023 alone, the rocket made **96 launches,** and exceeded the annual launch total in any country.
- The grounding of Falcon 9 is also likely to **postpone upcoming missions** taking astronauts to orbit. The **private Polaris Dawn mission** spearheaded by the entrepreneur **Jared Isaacman** is slated for the end of July.
- The rocket is also scheduled to take four astronauts to the **International Space Station (ISS) for NASA in mid-August** — **Falcon 9 is the only US rocket capable of taking NASA astronauts to ISS.**

- The rocket will remain **grounded till the time SpaceX investigates** the cause of failure, fixes the issue, and gets approval from the FAA.

## ISRO has a problem: many rockets, but too few satellites to launch

**Subject: Science and tech**

**Sec: Space sector**

**Context:**

**Indian space programme** used to follow a **supply-driven model**: ISRO would **launch satellites** and then look for **customers for services** provided by the satellites. This changed to a **demand-driven model in 2019-2020**, in which a satellite is built and launched only if there is already demand for it.

**More about News:**

- ISRO's launch vehicle capability was **three-times the demand**. **Strong demand** was needed for launch vehicles from the **domestic Indian market**.

**India currently has four launch vehicles:**

- **Small Satellite Launch Vehicle (SSLV)**
- **3 stage Launch Vehicle** configured with **three Solid Propulsion Stages** and **liquid propulsion** based **Velocity Trimming Module (VTM)** as a **terminal stage**.
- **Cost per launch:** ₹35 crore (US\$4.2 million) (expected)
- **Diameter:** 2 m (6 ft 7 in)
- **Height:** 34 m (112 ft)
- **Last flight:** 10 February 2023, EOS-07
- **Features**
  - Low cost
  - Low turn-around time
  - Flexibility in accommodating multiple satellites
  - Launch on demand feasibility
  - Minimal launch infrastructure requirements
- **Polar Satellite Launch Vehicle (PSLV)**
  - **Manufacturer:** ISRO
  - **Rocket Function:** Artificial satellite
- **Geosynchronous Satellite Launch Vehicle (GSLV)**
  - **Developed:** India
  - To launch communication satellites in geo transfer orbit using **cryogenic third stage**.
  - **Initially Russian GK supplied cryogenic stages** were used.
- **Launch Vehicle Mark-III (LVM-3)**
- **Cost per launch:** ₹500 crore (US\$60 million)
- **First flight:** 18 December 2014 (suborbital); 5 June 2017 (orbital)
- **Function:** Medium-lift launch vehicle
- **Height:** 43 m (142.5 ft)
- **Last flight:** 14 July 2023

**India also relies on foreign launch vehicles**

- **Europe's Ariane V**
  - **Manufacturer:** European space agency
- **SpaceX's Falcon 9**
  - **Manufacturer:** SpaceX

**At present, the country operates a fleet of satellites with applications in**

- Communications,
- Remote sensing,
- Positioning,
- Navigation and timing (PNT),

- Meteorology,
- Disaster management,
- Space-based internet,
- Scientific missions
- Experimental missions.

#### Launch vehicles for space missions:

- **Chandrayaan 3**
  - **Start date:** 14 July 2023
  - **Location:** Satish Dhawan Space Centre
  - **Launch site:** Satish Dhawan Space Centre
  - **Distance driven:** 4 m (333 ft)
  - **Launch mass:** 3900 kg (8600 lb)
  - **Manufacturer:** ISRO
  - **Orbital insertion:** 5 August 2023
- **Aditya L1**
  - **Launch date:** 2 September 2023
  - **Cost:** 5 crores USD (2018)
  - **Launch site:** Satish Dhawan Space Centre
  - **Manufacturers:** ISRO, Indian Institute of Astrophysics (IIA), The Inter-University Centre for Astronomy and Astrophysics
  - **COSPAR ID:** 2023-132A
  - **Mission duration:** 2 years (planned); 10 months and 9 days (elapsed)

#### Where is the issue?

##### Demand-driven model:

The **Indian space programme** used to follow a **supply-driven model**: ISRO would build and **launch satellites** and then look for customers who needed the services provided by the satellites.

When the **Indian government reformed the space sector in 2019-2020**, it changed this to a demand-driven model. Here, a satellite needs to be built and launched only if there is already demand for it.

The **customer of the services** provided by the satellite **needs to be educated** about the **need for the service**. The customer will then **create a demand** for a service that will need a **satellite to be launched**. This will provide the demand.

##### Who will educate the customer, ISRO or the industry?

**Without such educated customers**, demand at the scale **ISRO expects will not be created**. The customers here are **not only consumers** of space-based internet.

##### Demand:

- **Companies, government institutions, defence enterprises**, and ordinary people including **farmers, bankers,**
- **Human space flight**
- **Space tourism**

##### Launch capability limitations

- India's **launch vehicles** are **also not powerful** enough to undertake certain missions, like **Chandrayaan 4**. **China** used its **Long March 5** launch vehicle to launch its **Chang'e 4** and **Chang'e 5 missions** in a **single launch**.
- India's **LVM-3** has less than **one-third of Long March 5's** capability (28% to be more precise) and will need **two LVM-3** launches to launch all the components of **Chandrayaan 4**.
- **ISRO** will be **upgrading** the LVM-3 with a **semi-cryogenic engine to boost** its payload capacity to **six tonnes to the geostationary transfer orbit (GTO)**.
- The organisation will also need a **new launch vehicle** — already dubbed the Next Generation **Launch Vehicle (NGLV)**, **a.k.a. Project Soorya** — to carry **10 tonnes to GTO**.

##### Project SOORYA:

- **Aim** –To develop NGLV and build the country's own space station to send Indians to the Moon
- Requirement – **3<sup>rd</sup> launch pad at Sriharikota** needed as NGLV's configuration is different from the current class of rockets
- **India's Space Vision 2047** – Helps to achieve the goals of building a space station by 2035 and



eventually sending Indians to Moon

### New Generation Launch Vehicle (NGLV):

- **India's biggest rocket** (expected to be ready by 2034-35)

### Features of NGLV –

- A **3-stage** launch vehicle
- Fuel – **Green fuel combinations** (methane-liquid oxygen or kerosene-liquid oxygen)
- **Payload capacity** – Up to 10 tonnes to **Geostationary Transfer Orbit (GTO)**
- Reusability – **Recoverable parts**
- **Cost-competitive rocket** – Reusability reduces the launch costs, of around \$1,900 per kg to Low Earth Orbit (LEO), compared to \$3,000/kg for an expendable configuration.

### Launch vehicle economics:

- The **heavier vehicles** can full fill some national goals like **lunar exploration** and a **space station** while **ISRO can use the smaller satellites for technology and capability**
- **Satellites** have a **defined mission life**. As they get **old**, they will need to be **replaced with newer** This will also **create a demand for launch vehicles**.
- **Mission operators** have been **improving their lifetimes** with **software and hardware** This complicates **estimates of the number and frequency of launch vehicles** that will be needed.
- In a **single launch**, the PSLV can **deliver multiple satellites in multiple orbits**.
- **Rocket stages** are becoming **reusable**, which **reduces the cost of building the rocket** and **increases profitability**.
- **ISRO** has been building its **Reusable Launch Vehicle** and **vertical landing technologies** to make **reusable landing stages**. It is also making an effort to **replace toxic fuels for rocket engines with green alternatives**.

### Private sector vs government

- **Ecosystem** that creates **demand for various services**, leading to a **demand for data**, culminating in a demand for **launch vehicles**.
- The **Indian government** wants the **private sector to create demand** among **customers and to build and launch satellites**. It wants them to look for services to offer customers in India and abroad. It also wants **revenue by providing launch services** of its own.
- **Government** wants to **upskill workers** and give them jobs.
- **Private companies** don't want the **government** to be in the **launch business**. Instead, they want the **government to be their customer** and to **provide rule of law and reliable regulations**. This is because private players **desire a reliable source of revenue**, which the Indian government can be over a **long period of time**.
- **Indian government** will **absorb the cost of the transition from supply-driven to demand-driven building of satellites and launch vehicles**. But it isn't yet **educating its own Ministries** and **creating the demand** for satellites and launch vehicles.

### In painstaking steps, scientists piece the neutrino universe together

**Sub: Sci**

**Sec: Space sector**

**Context:**

- Researchers conducting an experiment with the **Large Hadron Collider** reported observing **electron-neutrinos in a particle collider** for the first time.

### What is Neutrino?

- **Neutrinos** are a type of **subatomic particle** which **do not have an electric charge** but have a **small mass, and are left-handed** (a physics term meaning the **direction of its spin is opposite to the direction of its motion**).
- They are the **second-most abundant particles after photons** (particles of light) and the most abundant among particles that make up matter.
- The **study of neutrinos is an area of immense current interest** among particle physicists and astrophysicists.
- These particles are produced when particles called leptons interact with matter.
  - For example, when a **type of lepton called a muon interacts with matter**, the interaction produces a **muon-neutrino**.
- **Neutrinos** are the **best information carriers** because **neutrinos pass through most matter untouched**, they can carry information across large distances.

### What is NOvA?

- The NOvA (NuMI Off-Axis ve Appearance) experiment is a particle physics experiment designed to determine the **role of neutrinos in the evolution of the cosmos**.
- NOvA is managed by the **Fermi National Accelerator Laboratory**.
- NOvA does this by trying to understand which neutrino type has the most mass and which type has the least.

### What is Neutrino oscillation?

- **Neutrino oscillation** is a quantum mechanical phenomenon in which a **neutrino created** with a **specific lepton family number** can later be **measured to have a different lepton family number**.
- The probability of measuring a particular flavor for a neutrino **varies between three known states**, as it propagates through space.
- **Neutrino oscillation** is of **great theoretical and experimental interest**, as the precise properties of the process can **shed light on several properties of the neutrino**.

### Global neutrino experiments.

- Super-K III in Japan
- Sudbury Neutrino Observatory (in its new SNO+ avatar) in Canada
- MiniBOONE, the MicroBOONE, and NOvA in the U.S.
- Double CHOOZ in France
- Jiangmen Underground Neutrino Observatory in China
- OPERA experiment in Switzerland
- IceCube Neutrino Observatory in Antarctica.

### What is the status of India in neutrino study?

India's own **India-based Neutrino Observatory**, funded by the **Department of Atomic Energy**, was supposed to come up in **Tamil Nadu** but currently faces an uncertain future over procedural lapses and lack of political support.

### Scientists propose a new measure of flexibility for crystals

**Sub: Science and tech**

**Sec: Msc**

**Context:**

- **Professor Umesh V. Waghmare** from the Theoretical Sciences Unit at **Jawaharlal Nehru Centre for Advanced Scientific Research, (JNCASR) Bengaluru** and his team recently introduced a novel quantitative measure of mechanical flexibility for crystals that can be used to **screen materials databases to identify next-generation flexible materials**.

**More on news:**

- Researchers have carried out an in-depth analysis of the mechanisms underlying the flexibility of crystals of **Metal-organic frameworks (MOFs)** and attributed the flexibility to large structural rearrangements associated with soft and hard vibrations within a crystal that strongly couples to strain fields.

**About Metal-organic frameworks (MOFs):**

- **Metal-organic frameworks (MOFs)** are a large class of crystalline materials which possess the **remarkable ability to absorb gasses**, such as carbon dioxide, and store them as well as act as filters for crude oil purification.
- MOFs derive their ability from the **presence of nanopores**, enhancing their surface areas that, in turn, make them adept at **absorbing and storing gasses**.
- However, **limited stability and mechanical weakness** have hindered their broader applications.
- **Flexibility in crystals** has been assessed in terms of a parameter called **elastic modulus**, which is a measure of a material's resistance to **strain-induced deformation**.
- In contrast, this study proposes a unique theoretical measure based on the fractional release of elastic stress or strain energy through **internal structural rearrangements under symmetry constraints**.
- This new metric can be readily calculated using standard techniques of simulation and can rate the **flexibility of a crystal on a scale of zero to one**, zero signifying the least flexibility while one indicates maximum flexibility.

### Extinct humans occupied the Tibetan plateau 160000 years ago

**Sub: Science and tech**

**Sec : Msc**

**About Denisovans:**

- **Extinct ancient humans**, contemporary with **Neanderthals** and **Homo sapiens**.
- Known to **interbreed** with **Neanderthals** and **Homo sapiens**.
- Rare remains make detailed knowledge about them scarce.
- **Denisovan Activities:**
  - Hunted and butchered various animals.
  - Consumed meat and bone marrow.
  - Used bones to produce tools.

#### Discovery of Denisovan Remains in Tibetan Cave- Research Details:

- **Sample Size:** Over 2,500 bones were analyzed.
- **Location:** Baishiya Karst Cave, Tibetan Plateau.
- **Identification Method:** Novel technique using bone collagen differences.
- **Findings:** Bone remains in **Baishiya Karst Cave** on the **Tibetan Plateau** indicate **Denisovans survived for millennia**.

#### Key Discoveries:

- **Rib Bone:** Identified as belonging to a **Denisovan individual**.
- **Dating:** The layer dated between **48,000** and **32,000 years ago**, during **early human dispersal** across **Eurasia**.
- **Climate Adaptation:** Lived through **cold periods** and a **warmer interglacial period** from **200,000** to **40,000 years ago**.

#### Animal Remains:

- The majority are from **blue sheep (bharal)**, **wild yaks**, **equids**, **extinct woolly rhinos**, and **spotted hyenas**.
- Included **small mammals (marmots)** and **birds**.

#### Significance:

- Insights into Denisovan survival and adaptation in high-altitude and fluctuating climates.
- Enhanced understanding of their lifestyle and interaction with the environment.

#### The ANRF plan has got off on the wrong foot

##### Sub: Science and tech

##### Sec: Msc

##### Context:

- In **2023**, the **Anusandhan National Research Foundation (ANRF) Bill** was passed by both Houses of Parliament to **enhance research in India's universities and colleges**.

#### ANRF Act 2023:

- It seeks to regulate all research and development in the fields of natural sciences establishments in India.
- The **Science and Engineering Research Board (SERB)** established by an act of Parliament in **2008** has been subsumed into ANRF.
- The **2019 National Research Foundation (NRF) project report** explicitly mentioned that “**growing outstanding research cells already existing at State Universities**” is one of the ANRF’s top priorities.
- **The intended aim of ANRF:** Space for Indian academia for research free from the bureaucracy, funding boost and a chance to work together with industry partners.
- **Structure:**
  - 15-member Governing Board
  - 16-member Executive Council

#### Implementation Issues:

- The board and the executive council do not have any members from Central or State universities or colleges.
  - In addition to the **Principal Scientific Adviser**, they are represented by people who are usually in any **high-powered committees** of the **Government of India**.
  - The sole woman representative is the Secretary of the DSIR.
- The board and the council need representatives who understand the bottlenecks in the current system.
- Lack of adequate industry representation.
- ANRF plans to **raise more than 70% of its funding** from **non-government sources** and **industry**.
- There is **no representation** from the **Indian industry** or **entrepreneurs** from the **country** or **eminent academics** from the **Central and State universities** on the committee.

#### R&D Funding and System Overhaul:

- **Current Funding Status:**
  - **India** underfunds research and development.
  - Suggestion to **increase R&D budget to 4% of GDP.**

#### National Research Foundation (NRF):

- In **2005**, the **Science Advisory Council to the Prime Minister** recommended the formation of a **National Science and Engineering Research Foundation**. It was approved by the then **PM Manmohan Singh**. In 2008, it was **renamed** the **Science and Engineering Research Board (SERB)**.
- The **National Research Foundation (NRF)**, an **apex body** to provide **high-level strategic direction of scientific research** in the country in accordance with the recommendations of the **National Education Policy (NEP)**, will be established at a cost of **50,000 crore** over the **period 2023-28**.
- **Goals:** To increase private sector contributions to research in India and to ensure that a larger portion of government funds go to state universities and colleges.
- The **Department of Science and Technology (DST)** will be **NRF's administrative department**.

#### Organisational Structure of the National Research Foundation:

<b>Governing Board</b>	<b>Executive Council</b>	
<b>President/Chairperson</b>	Prime Minister of India	Principal Scientific Advisor
<b>Other Members</b>	<ul style="list-style-type: none"> <li>• Union Minister of Science and Technology and Union Minister of Education as Vice Presidents</li> <li>• Principal Scientific Advisor as Member Secretary.</li> <li>• Secretaries to the Departments of Science and Technology, Biotechnology, and Scientific and Industrial Research.</li> <li>• Member of the NITI Aayog dealing with science and technology.</li> <li>• The Board's President may appoint or nominate additional members from business organizations, social sciences, and humanities etc.</li> </ul>	- Secretaries to various departments of the central government including: <ul style="list-style-type: none"> <li>• Science and Technology,</li> <li>• Higher Education,</li> <li>• Health Research,</li> <li>• Agricultural Research</li> <li>• Defence Research</li> <li>• Atomic Energy</li> <li>• Space</li> </ul>
<b>Functions</b>	<ul style="list-style-type: none"> <li>• Governed the administrative department of NRF.</li> <li>• Provide policy guidance to the Foundation and oversee implementation.</li> </ul>	- Implement the objectives of the Foundation based on the policy direction and guidance provided by the Governing Board. - Examining applications for financial aid, - Developing a budget and managing its accounts.

#### In an electric vehicle, what is regenerative braking?

**Sub: Science and tech**

**Sec: Basic science**

**Context:**

**What is braking?**

- **Braking** is the mechanism by which an **automotive vehicle in motion slows down**.
- A **vehicle moving** faster has **more kinetic energy** than a vehicle moving slower, so the process of braking removes (mostly) kinetic energy from the vehicle.

**What is regenerative braking?**

- **Regenerative braking** is an **energy recovery mechanism** that **slows down** a moving vehicle or object by **converting its kinetic energy or potential energy** into a form that can be **either used** immediately or **stored** until needed.
- It works by **driving an electric motor in reverse** to **recapture energy** that would otherwise be lost as heat during braking, effectively turning the **traction motor into a generator**.
- During regenerative braking, the **motor operates as a generator, turning mechanical energy back to electrical energy**.
- In addition to improving the overall efficiency of the vehicle, **regeneration can significantly extend the life of the braking system**.

### How it is different from conventional braking systems:

- Regenerative braking system contrasts with **conventional braking systems, where excess kinetic energy is converted to unwanted and wasted heat due to friction** in the brakes.
- Similarly, with **rheostatic brakes**, energy is recovered by **using electric motors** as generators but is immediately dissipated as heat in resistors.

### Does regenerative braking have downsides?

- Regenerative braking **alone often doesn't suffice** to bring an electric vehicle to a halt.
- It has to be used **together with a conventional system** that dissipates some of the kinetic energy as heat.
- A regenerative brake can **mostly be beneficial for an electric vehicle's** energy-use efficiency in **stop-start traffic**.

## Searching for LUCA, the first life-form from which all other life descended

Sub : Sci

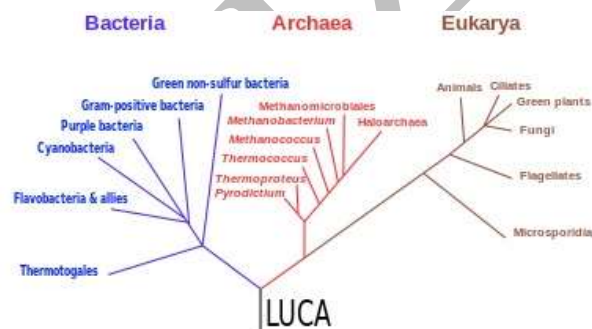
Sec : Msc

### Context:

- In a new study, scientists have said the **last universal common ancestor (LUCA)** could have formed just **300 million years** after the earth formed.

### What is LUCA?

- **The last universal common ancestor (LUCA)** is the **hypothesized common ancestral cell** from which the three domains of life, the **Bacteria, the Archaea, and the Eukarya** originated.
- The **concept of LUCA** is based on the **phylogenetic relationship among all the organisms**.
- **LUCA is not the first living form on earth** or the first living ancestors.
- There is **no fossil evidence to support the existence of LUCA**, but the fact that modern genomes share so many features provides some insights.
- The **first universal common ancestor (FUCA)** is a hypothetical **non-cellular ancestor to LUCA** and other now-extinct sister lineages.



### Which is older: LUCA or fossils?

- According to the journal **Nature Ecology and Evolution**, researchers at the University of Bristol and Exeter in the U.K. **constructed a phylogenetic tree of 350 bacterial and 350 archaeal genomes** and using a **molecular clock**, they estimated that **LUCA could have originated around 4.2 billion years ago, just 300 million years after the earth itself formed**.
- The team also reported that **LUCA may have had a small genome, of some 2.5 million bases and encoding around 2,600 proteins**, which help it survive in a unique environmental niche.
- The team also suggested the **metabolites produced by LUCA** — compounds produced as a result of its metabolism — **could have created a 'secondary' ecosystem** in which other microbes could have emerged.
- Researchers have found **fossil records of the earliest life-forms in the Pilbara Craton in western Australia**, one of the few places on the planet **where archaean rocks are exposed** aboveground and accessible.
- Studies of these fossils have suggested the **life that lived on the rocks emerged around 3.4 billion years ago**.
- The current study has **pushed this date back by almost a billion years**, almost on the heels of the birth of our planet itself.
- The researchers also found that **LUCA may have had genes responsible for immunity, suggesting it had to fight off viruses**.

### What is a Molecular Clock?

- The **molecular clock** is a figurative term for a **technique that uses the mutation rate of biomolecules to deduce the time** in prehistory when **two or more life forms diverged**.
- The **biomolecular data** used for such calculations are **usually nucleotide sequences for DNA, RNA, or amino acid sequences for proteins**.
- To calibrate the molecular clock to a particular rate of mutations, researchers establish **links between a genome with known events, such as the 'date' on which the first mammal evolved** or with the age of certain fossils. These links act like **temporal benchmarks**.

#### Origin of Earth

- **Earth formed around 4.54 billion years ago**, approximately one-third the age of the universe.
- There are a number of competing theories but all of them lack conclusive proof.
- **Oparin-Haldane hypothesis:**
  - In 1924 and 1929, **Oparin and Haldane respectively** suggested the first molecules making up the earliest life forms gradually self-organized from a **"primordial soup"** in a young earth's tempestuous, prebiotic environment.
- **Miller-Urey experiment:**
  - **Miller-Urey experiment in 1952**, showed that in the right conditions, **inorganic compounds** could give rise to **complex organic compounds**.
  - **Miller and Urey mixed methane, ammonia, and water, and when they applied a strong electric current** — like a lightning strike might have — the mixture contained amino acids, the building blocks of proteins.

**As IBC 2024 starts in Madrid on July 21, botanists show pejorative K-word in floral nomenclature the door**

**Sub: Sci**

**Sec: Msc**

**Context:**

- **20th International Botanical Congress (IBC)** held in **Madrid, Spain**.

#### Controversial Term:

- Botanists voted to **remove an offensive term** from over **200 plant species names**.
- The new names will reflect the **plants' African origins**.
- The term **"Caffra,"** derived from **"Kafir"** in the **Quran**, became **racially offensive** under **South African apartheid**.
- Botanists proposed removing the letter **"c"** from plant names to form **"afra," "afrosum,"** or **"afrum."**
- **Over 200 species'** names will change by **2026**, such as the **coast coral tree** from **Erythrina caffra** to **Erythrina affra**.

#### Historical Context

- The term was used **pejoratively** by **European explorers** and colonists for **black people in southern Africa**.
- **Afrikaners**, descendants of **European settlers**, used the term to **abuse black South Africans**, including **Nelson Mandela**.
- The term became particularly **offensive** in the **mid-20th century** under **apartheid policies**.



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