

WEEKLY UPDATES

DATE : 19th -25th AUGUST

POLITY & GOVERNANCE

UPSC's Lateral Entry Recruitment Sparks Controversy

Why in News?

- UPSC issued a notification for recruiting **45 joint secretaries, directors, and deputy secretaries** through the **lateral entry scheme**.
- The opposition claims it undermines **reservation rights** for **OBCs, SCs, and STs**.

Lateral Entry Scheme:

- **About:** Lateral Entry recruits **mid-level and senior specialists** from outside the government for **3-year contracts**, extendable to **5 years**.
- **Origin:** Introduced during **2004-09** and recommended by **NITI Aayog** in **2017** to enhance governance with domain expertise.
- **Eligibility:** Open to individuals with **relevant expertise** from the **private sector, state governments, PSUs, and autonomous bodies**.
- **Reservation in Lateral Entry:** Excluded from **reservation** under the **"13-point roster"** policy as each post is considered **single** and hence bypasses quota requirements.
- **Administrative Reforms Commission (ARC) Recommendations:** **Second ARC (2005):** Advocated lateral entry for specialised skills not always available within traditional civil services.
- **Social Justice in Bureaucracy: Proposed Reforms:** Replace **age-based retirement** with a **fixed tenure system** (35 years) to ensure SC/ST/OBC candidates reach senior positions.

ARGUMENTS FOR LATERAL ENTRY:

- **Specialised Skills:** Bridges knowledge gaps in governance.
- **Innovation:** Lateral recruits can bring fresh ideas and help reform processes.
- **Filling Vacancies:** Helps address the shortage of IAS officers (around 1500).

CRITICISM OF LATERAL ENTRY:

- **Short Tenure:** 3 years is too short for effective contributions.
- **Morale Impact:** Potential divide between career officers and lateral recruits.
- **Neutrality Concerns:** Risk of conflicts of interest from recruits' prior affiliations.

Way Forward:

- **Ensure Transparency:** A **merit-based selection** process to avoid bias.
- **Training:** Intensive programs for lateral entrants to understand government complexities.
- **Relax Age Barrier:** Lower age requirements to attract top talent in line with past examples like **Montek Singh Ahluwalia** and **Bimal Jalan**.

CBI Authorised to Conduct Polygraph Test in Kolkata Doctor's Murder Case

- The **Central Bureau of Investigation (CBI)** has been authorised to conduct a **polygraph test** on the key suspect in the **rape and murder case** of a postgraduate doctor at Kolkata Medical College. The test aims to verify the suspect's statements and identify potential deception.

What is a Polygraph Test?

- Definition:** A **polygraph test** (lie detector test) records **physiological indicators** such as **blood pressure, pulse, respiration, and skin conductivity** while the subject answers a series of questions.
- Assumption:** The test assumes that **physiological responses** change when a person is **lying** compared to when they are telling the truth.
- Process:** Each response is given a numerical value to determine whether the individual is telling the truth, deceiving, or uncertain.
- History:** The concept dates back to the 19th century when **Cesare Lombroso**, an Italian criminologist, used a machine to measure **blood pressure** during interrogations.

Difference from Narco-Analysis Test:

- Narco-Analysis:** Involves administering **sodium pentothal** to induce a **sedated state**, where the subject is believed to be unable to lie and may reveal truthful information.

Accuracy of Tests:

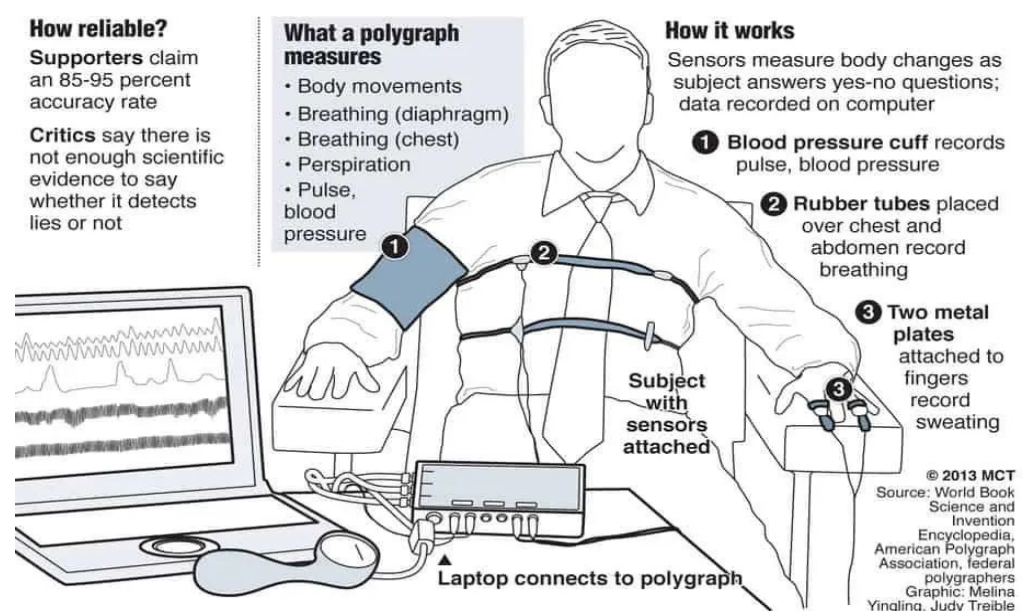
- Controversy:** Both **polygraph** and **narco-analysis tests** are not scientifically proven to be **100% accurate** and remain controversial in the medical field.
- Usage:** Despite the lack of certainty, these tests are sometimes used as a "softer alternative" to traditional interrogation methods to extract information from suspects.

NHRC Guidelines on Polygraph Test

- Voluntary Consent:** The accused must voluntarily agree to the test, with the option to refuse.
- Informed Consent:** The accused must be fully informed of the test's purpose, procedure, and legal consequences.
- Recorded Consent:** The accused's consent must be recorded in the presence of a **Judicial Magistrate**.
- Clarification:** Statements made during the test are treated as **statements to the police**, not confessions.
- Judicial Scrutiny:** Judges consider the **detention period** and **interrogation nature** when evaluating test results.

Do polygraphs detect lies?

Polygraph or "lie detector" exams continue to be used by law enforcement and government agencies for various screenings even though most criminal courts ban polygraph evidence.



Legal Admissibility of Polygraph Test in India

- Article 20(3) Violation:**
 - Polygraph, narco-analysis, and brain mapping tests** without consent violate **Article 20(3)** of the **Indian Constitution**, which protects individuals from self-incrimination.
- Consent Requirement:**
 - Consent** is mandatory for such tests, as they involve potentially self-incriminating information.
- Judicial and Human Rights Concerns:**
 - Courts have raised concerns over **mental torture and violation of privacy** under **Article 21** (Right to Life and Liberty).

Landmark Judgments Related to Polygraph Tests

- Selvi v. State of Karnataka (2010):**
 - The Supreme Court ruled that **involuntary narco-analysis and lie detector tests** violate the right against **self-incrimination** under **Article 20(3)**. It also emphasized the **right to mental privacy**.
- D.K. Basu v. State of West Bengal (1997):**
 - The SC held that **involuntary administration** of such tests is cruel and degrading, violating **Article 21**.
- State of Bombay v. Kathi Kalu Oghad (1961):**
 - The SC ruled that **physical evidence** like **fingerprints** and **voice samples** do not fall under **self-incrimination** if voluntarily given.
- Section 27 of the Indian Evidence Act (1872):**
 - Information discovered** through voluntary tests may be admitted as evidence if it leads to the discovery of facts.

Ministry of Women and Child Development Releases Model Foster Care Guidelines (MFCG) 2024

- The **Ministry of Women and Child Development** has issued the revised **Model Foster Care Guidelines (MFCG) 2024**, building upon the 2016 guidelines and aligned with various legal frameworks, including the **Juvenile Justice (Care and Protection of Children) Act, 2015**, **Adoption Regulations, 2022**, and **Mission Vatsalya Scheme**.

What is Foster Care?

- Foster care** refers to the **placement of a child** into the **domestic environment** of a family that is **not the child's biological family**. This family is selected and approved by the **Child Welfare Committee** to provide care for the child.

Key Provisions in Revised Guidelines:

1. Children Eligible for Foster Care:

- Children **above 6 years** living in **childcare institutions** or in the community.
- Includes **hard-to-place children**, **children with special needs**, and those with **unfit guardians**.

2. Eligibility to Foster:

- Any person, regardless of **marital status**, can foster a child (Previously, only married couples were eligible under the 2016 guidelines).
- Single females** can foster and adopt a child of **any gender**, whereas **single males** can only foster/adopt **male children**.
- Couples should have a **stable marital relationship** of at least **2 years**.

3. Foster Adoption:

- The revised guidelines allow a **foster parent** who has fostered a child for a minimum of **2 years** (previously 5 years) to **adopt** the same child.

Child Adoption Framework in India:

Central Adoption Resource Authority (CARA):

- CARA is the **nodal body** responsible for the adoption of **Indian children** and **regulates in-country and inter-country adoptions**.
- It functions as a **statutory body** under the **Ministry of Women & Child Development**, established by the **Juvenile Justice Act, 2015**.
- CARA primarily manages the adoption of **orphaned, abandoned, and surrendered children** through **recognized adoption agencies**.

Competition Commission of India (CCI) Raises Objection to Reliance-Disney Proposed Merger

Context: On August 23, 2024, the CCI raised concerns about the potential **Reliance-Disney merger**, particularly regarding its possible dominance in the **cricket broadcasting market**. This could lead to reduced competition, which prompted the CCI to issue a **statement of objections** under the **Competition (Amendment) Act 2023**.

Key Details: Competition (Amendment) Act 2023: Allows the CCI to issue a **statement of objections** when it believes a merger could **adversely affect competition** in the market.

Other Recent CCI Actions:

- Google:** The CCI imposed a penalty of **Rs. 1337.76 crore** on **Google** for **anti-competitive practices** related to Android mobile devices.
- Amazon and Flipkart:** The CCI found that both companies violated **antitrust laws** by favoring sellers **affiliated with or controlled** by them.

Why Lack of Competition is Harmful to Consumers:

- Inefficiencies:** A monopoly may lead to lower product quality and create **barriers** for competitors.
- Innovation:** Monopolistic companies lack the pressure to **innovate** or improve their products.
- Higher Prices:** Without competition, monopolies have more power to **set higher prices**, which harms consumers.

About the Competition Commission of India (CCI):

- **Genesis:** Established in **2009** under the **Competition Act, 2002**, the CCI is an **autonomous statutory body**.
- **Aim:** To **enforce the Act**, ensuring **fair competition** and **protecting consumer interests**.

Function: Acts as a **quasi-judicial body** to manage and regulate competition in the Indian market

Bharatiya Nagarik Suraksha Sanhita (BNSS)

Context: The **Supreme Court** upheld the **retrospective benefit** of **Section 479** of the **Bharatiya Nagarik Suraksha Sanhita (BNSS)** for **first-time offenders**. The **BNSS** replaced the **Code of Criminal Procedure (CrPC)** on **July 1, 2024**.

About Section 479:

- **Bail Provision for Undertrials:**
 - **Undertrials** who have spent at least **half of the maximum sentence** prescribed for their offense during detention (during investigation, inquiry, or trial) are **entitled to bail**.
- **First-Time Offenders:**
 - For **first-time offenders**, the requirement is reduced to **one-third of the maximum sentence**.
- **Exclusions:**
 - This provision does **not apply** to offenses punishable by **life imprisonment** or **death**.

Significance:

The **BNSS** introduces more lenient bail provisions for undertrials, particularly for **first-time offenders**, with the aim of reducing **pretrial detention**. However, the exclusion of more severe crimes ensures that those facing **life sentences** or **capital punishment** do not benefit from these provisions.

INTERNATIONAL RELATIONS

India and Malaysia Elevate Ties to Comprehensive Strategic Partnership



- India and Malaysia have upgraded their relationship to a **Comprehensive Strategic Partnership** during the **Malaysian Prime Minister's visit to India**. The move signals a deepening of cooperation and renewed focus on mutual interests.

Key Outcomes of the Malaysian Prime Minister's Visit to India:

1. **Comprehensive Strategic Partnership:**
 - Upgraded from the **Enhanced Strategic Partnership** of 2015 to a **Comprehensive Strategic Partnership**.
2. **Economic and Trade Enhancements:**
 - Bilateral trade hit a **record high of USD 19.5 billion**.
 - Focus on investments in **fintech, energy, digital technologies, and start-ups**.

1. ASEAN-India Trade in Goods Agreement (AITIGA):

- Agreed to expedite the review process for AITIGA, aiming to conclude it by **2025** to improve supply chain connections.

2. MoUs and Agreements:

- **Recruitment, Employment, and Repatriation of Workers:** Streamlining processes for workers between India and Malaysia.
- **Ayurveda and Traditional Medicine:** Establishment of an **Ayurveda Chair** at Universiti Tunku Abdul Rahman in Malaysia.
- **Digital Technologies:** Collaboration in **cybersecurity, AI, and digital infrastructure**.
- **Tourism:** Promoting easier travel with Malaysia designating **2026 as Visit Malaysia Year**.

3. Defense and Security Collaboration:

- Enhanced **defense cooperation, joint exercises, and capacity building**.
- Commitment to counter **terrorism** and transnational crime.

4. Educational Cooperation:

- Malaysia welcomed **100 seats under India's ITEC Programme** for Malaysian students in **cybersecurity, AI, and machine learning**.

5. Multilateral Cooperation:

- Support for **ASEAN centrality** and Malaysia's upcoming **ASEAN Chairmanship in 2025**.
- Malaysia seeks India's support for its **BRICS membership**.

6. Sustainable Development and Climate Action:

- Collaboration on **sustainable energy and climate change**.
- Malaysia joins India's **International Big Cat Alliance (IBCA)**.

Significance for India's Strategic Interests:

1. Act East Policy:

- Aligns with India's strategy to strengthen ties with **Southeast Asian nations**, boosting its influence in the **ASEAN region**.

2. Past Frictions:

- The visit offers a chance to mend past tensions related to Malaysia's criticisms of India's internal policies, particularly regarding **Article 370** and the **Citizenship Amendment Act (CAA)**.

3. Indo-Pacific Oceans Initiative (IPOI):

- Malaysia's potential involvement in **IPOI** could enhance cooperation in the Indo-Pacific, contributing to regional security.

4. South China Sea Concerns:

- India gains insights into Malaysia's stance on **China's influence** in the region, helping shape its Indo-Pacific strategy.

5. Trade and Investment:

- Malaysia remains a key **trading partner and investor** in India. Strengthening these ties is crucial for enhancing bilateral trade and economic collaboration.

Key Highlights of India-Malaysia Relations:

1. **Historical Ties:**
 - The **Chola Empire's** influence on the **Malay Peninsula** established deep cultural and economic ties over a millennium ago.
2. **Economic Relations:**
 - Malaysia is India's **3rd largest trading partner** in ASEAN, with robust trade in **palm oil, machinery, and chemicals**.
 - The **Comprehensive Economic Cooperation Agreement (CECA)**, effective since 2011, supports trade and investment.
3. **Defense Cooperation:**
 - Established through the **1993 MoU**, including joint military exercises like **Harimau Shakti** and the recent amendment to boost defense ties.
4. **Cultural and Educational Exchanges:**
 - **Indian Cultural Center** in Malaysia fosters cultural ties, with significant Indian-origin populations preserving cultural heritage through temples, festivals, and language.



Key Facts About Malaysia:

- **Location:** Southeast Asia, comprising **Peninsular Malaysia** and **East Malaysia**.
- **Capital:** **Kuala Lumpur**.
- **Geography:** Rich biodiversity, tropical rainforests, and home to species like **Malayan tigers**.
- **Strait of Malacca:** Key shipping route between the **Indian and Pacific Oceans**, making Malaysia strategically significant for global trade.

India Hosts 3rd Voice of Global South Summit

- India hosted the **3rd Voice of Global South Summit (VOGSS)** on **17th August 2024** in a virtual format with the theme, "**An Empowered Global South for a Sustainable Future.**"
- **123 countries** participated, though **China and Pakistan** were notably not invited.
- India had previously hosted the 1st and 2nd VOGSS in **January and November 2023**, both virtually.

What is the Voice of Global South Summit (VOGSS)?

- **About:** The VOGSS is a unique **India-led initiative** aimed at uniting the **Global South** to share perspectives and address common challenges on a global platform.
- **Philosophy:** The initiative reflects India's philosophy of "**Vasudhaiva Kutumbakam**" (One Earth, One Family, One Future) and aligns with the **Prime Minister's vision** of **Sabka Saath, Sabka Vikas, Sabka Vishwas, and Sabka Prayas**.



Need for VOGSS:

- Recent global challenges like the **Covid-19 pandemic, Ukraine conflict**, and rising issues of **food and energy security** have severely impacted developing countries.
- Concerns of the Global South often remain underrepresented on the global stage.
- Existing platforms have proven inadequate for addressing the specific concerns of developing nations.

Key Outcomes of the 3rd VOGSS 2024:

1. Global Development Compact (GDC):

- The Indian Prime Minister proposed a **four-fold GDC** with key elements:
 - **Trade for development**
 - **Capacity building for sustainable growth**
 - **Technology sharing**
 - **Project-specific concessional finance and grants**

2. Funding and Support:

- India announced significant initiatives, including:
 - **USD 2.5 million** fund for **trade promotion activities**.
 - **USD 1 million** fund for **capacity building** in trade policy and negotiations.

3. Healthcare Promotion:

- India committed to making **affordable generic medicines** accessible to the Global South.
- It will support training of drug regulators and share experiences in **natural farming**.

4. Reforming Global Institutions:

- The Prime Minister emphasized the need for **just and inclusive global governance**, urging for the reformation of global institutions to prioritize the Global South's concerns.

5. Collaboration for SDGs:

- A shared vision of achieving **Sustainable Development Goals (SDGs)** by 2030, focusing on development finance, health, climate change, technology, and youth empowerment.

What is the Global South?

- **Origin:** Coined by **Carl Oglesby in 1969**, the term refers to countries in **Latin America, Asia, Africa, and Oceania** that have been marginalized politically and economically.
- **Brandt Line:** The **Brandt Line** visually represents the economic divide between the **Global North** (wealthier) and **Global South** (poorer), proposed by **Willy Brandt** in the 1970s.

THE GLOBAL SOUTH



NORTH-SOUTH DIVIDE IN THE WORLD

Challenges for India as the "Voice of Global South"

1. Geopolitical Competition:

- India is seen as a competitor to **China** in leading the Global South. China's **Belt and Road Initiative (BRI)** is gaining influence, posing challenges for India's leadership.

2. Food Security:

- India's decision to **restrict rice exports** in 2023 has been criticized as conflicting with its commitment to addressing food security within the Global South.

3. Pharmaceutical Scrutiny:

- India's role as the "pharmacy of the world" has been questioned due to recent controversies over **contaminated medicines**.

4. Internal Development Issues:

- Critics argue that India should first address domestic issues such as **poverty, unemployment, and infrastructure gaps** before taking on a leadership role in the Global South.

Way Forward

1. Strengthen Strategic Partnerships:

- India should continue to build alliances with Global South countries in **technology, education, and healthcare** to counter China's influence.

2. Balanced Development Model:

- Advocate for a **sustainable and inclusive development model** that contrasts with China's debt-driven approach, positioning India as an ethical and people-centered leader.

3. Reassess Export Policies:

- India should balance domestic food security with its **global responsibilities** by investing in **agricultural innovation**.

4. Prioritize Domestic Challenges:

- Strengthening domestic infrastructure, tackling **poverty**, and improving access to **education and healthcare** will boost India's credibility as a leader of the Global South.

Report Highlights Indian Americans' Contributions to U.S. Society

Why in News?

- A recent report by **Boston Consulting Group (BCG)** and **Indiaspora** sheds light on the **significant contributions** of the **Indian diaspora** to the **U.S. society**, despite making up only **1.5% of the population**.

Contributions of the Indian Diaspora in the USA:

- 1. Economic Impact:**
 - **CEOs of Indian origin** lead **16 Fortune 500 companies**, including notable figures like **Satya Nadella** (Microsoft) and **Shantanu Narayen** (Adobe).
- 2. Cultural Influence:**
 - **Indian festivals** like **Diwali** and **Holi** are widely celebrated across the U.S.
 - Celebrated Indian chefs like **Vikas Khanna** and wellness experts like **Deepak Chopra** have brought **Indian culinary and wellness practices** to the mainstream.
- 3. Innovation, Research, and Development:**
 - **13% of U.S. scientific publications** feature an **Indian American co-author**.
 - Renowned figures include **Har Gobind Khorana**, **Abhijit Banerjee**, and **Manjul Bhargava**.
- 4. Government and Public Services:**
 - **Kamala Harris** is the first woman **Vice President of Indian descent**.
 - **Bobby Jindal** was the first **Indian American Governor** in the U.S.



Initiatives for Diaspora Engagement by India:

- 1. Know India Programme (KIP):**
 - Organized by the **Ministry of External Affairs** to engage with the Indian diaspora.
- 2. Pravasi Bharatiya Divas:**
 - Celebrated on **9th January** every two years to honor the Indian diaspora.
- 3. Indian Community Welfare Fund (ICWF):**
 - Supports the welfare of Indian citizens overseas

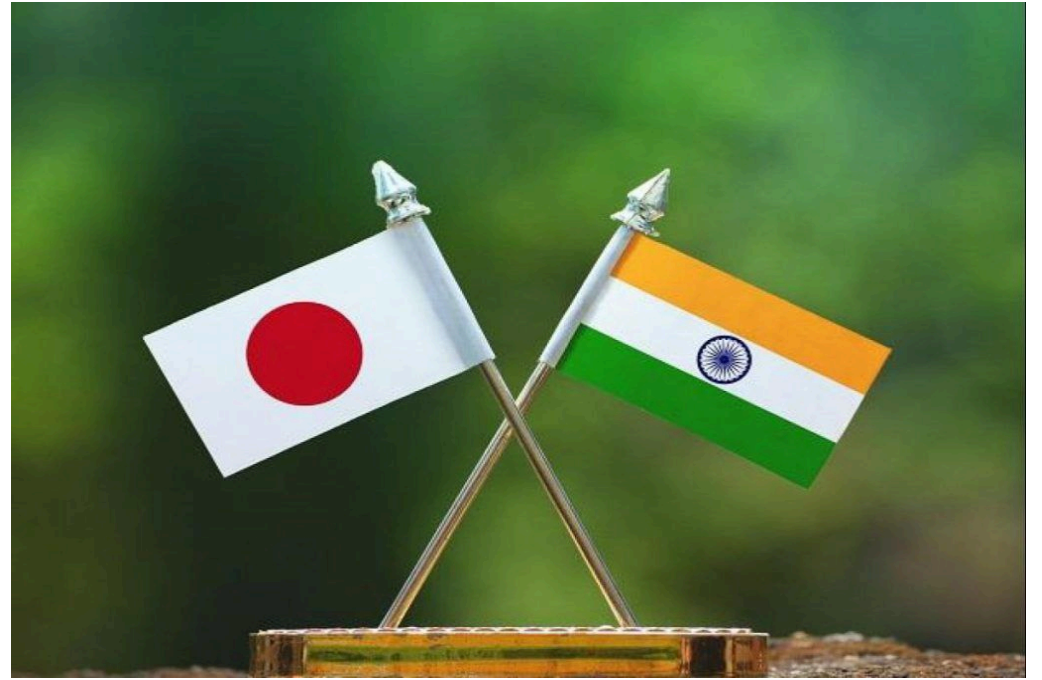
Benefits for India:

- 1. Economic:**
 - The U.S. is India's **top source of remittances**, with **\$26 billion** out of **\$113 billion** received in **2022-2023**.
 - Since **2000**, U.S. companies have invested **\$63 billion** in **FDI** in India.
- 2. Brain Gain:**
 - **20% of Indian unicorns** have co-founders who leveraged **U.S. higher education**, such as **Rahul Chari** (PhonePe) and **Harsh Jain & Bhavin Seth** (Dream11).
- 3. Political:**
 - The diaspora plays a role in diplomacy and lobbying, such as during the **Indo-U.S. civil nuclear deal**.
 - Indian figures in global institutions include **Gita Gopinath**, **Raghuram Rajan**, and **Soumya Swaminathan**.
- 4. Cultural Diplomacy & Soft Power:**
 - **1 in 10 Americans** practices **yoga**.
 - **Indian cuisine** and **Ayurveda** continue to grow in popularity.
- 5. Indo-U.S. Scientific Collaboration:**
 - Examples include **NISAR** and **iCET**.

10 Years of India-Japan Special Strategic and Global Partnership (SGSP)

Why in News?

- In 2024, India and Japan celebrated **10 years** of their **Special Strategic and Global Partnership (SGSP)**, which was upgraded from a "Strategic and Global Partnership" in 2014 to align their **geo-economic** and **geo-strategic interests**.
- Additionally, the **third 2+2 Ministerial Dialogue** between the two nations was recently held in **New Delhi**.



About India-Japan SGSP:

- The **SGSP** reflects the **strategic imperative** for India and Japan to collaborate beyond traditional security concerns, encompassing a **comprehensive partnership**.

Key Pillars of SGSP:

1. **Global Partnership for Peace and Security:**
 - Enhancing cooperation to address **regional and global security** challenges.
2. **Civil Nuclear Energy and Non-Proliferation:**
 - Collaborating on **civil nuclear energy** while maintaining strong **export control** and **non-proliferation** standards.
3. **Science, Innovation, and Technology:**
 - Exploring new areas in **science, technology, and innovation** to foster **people-to-people connections** and boost development.

Key Outcomes of the 2+2 Ministerial Dialogue:

1. **Defence Equipment and Technology:**
 - Commitment to enhance **cooperation in defence equipment** and **critical emerging technologies**.
2. **Co-Production and Co-Development:**
 - Strengthening partnership with a focus on **co-production** and **co-development** under the **Make-in-India** initiative.



Areas of Cooperation between India and Japan:

1. **Indo-Pacific Region:**
 - Joint strategies like Japan's **Free and Open Indo-Pacific** and India's **Indo-Pacific Oceans Initiative** to ensure peace and stability.
2. **Developmental Cooperation:**
 - Initiatives like the **Asia-Africa Growth Corridor** and **Act East Forum** to promote regional growth and connectivity.
3. **Minilaterals:**
 - Engagements in multilateral dialogues such as **QUAD** and the **Supply Chain Resilience Initiative** to secure global supply chains and regional stability.

About 2+2 Ministerial Dialogue:

- The **2+2 dialogue mechanism** brings together the **Defence and Foreign Ministers** of two countries to discuss security and strategic matters.
- Apart from Japan, India has 2+2 dialogues with **the US, the UK, Australia, and Russia**.

Extradition Dynamics: India's Legal Pursuit Post-26/11

India has initiated discussions with the **United States** regarding the **extradition of a key plotter** involved in the **26/11 Mumbai attacks**, emphasizing the importance of justice for one of the most devastating terror attacks in Indian history. The process of extradition is governed by international agreements, bilateral treaties, and domestic legal frameworks.

Extradition Overview:

The **Supreme Court of India** defines extradition as the formal process by which one state delivers an individual to another state, where that individual is wanted for criminal prosecution or to serve a sentence for crimes already convicted.

- **Types of Extradition:** Requests can be made for individuals who are **under investigation, under trial, or convicted** of crimes.

Extradition Framework in India:

1. The Extradition Act, 1962:

- Consolidates India's laws on the extradition of fugitive criminals and is administered by the **Ministry of External Affairs**.
- The final decision on extradition lies with the **Government of India**; however, this decision can be **appealed** in higher courts.
- India has **48 extradition treaties** (including one with Bangladesh) and **12 agreements** with other countries.

Global Extradition Framework:

1. **United Nations Model Treaty on Extradition (1990):** Provides a framework for bilateral treaties between states.
2. **UN Model Law on Extradition (2004):** Serves as a guide for states to adopt effective extradition laws.
3. **United Nations Convention against Transnational Organized Crime (2000):** Includes extradition provisions for crimes associated with organized crime.

Key Principles of Extradition:

1. **Treaty-Based Offenses:** Extradition is only applicable for offenses explicitly listed in the bilateral treaties between the countries.
2. **Dual Criminality:** The crime for which extradition is sought must be recognized as a crime in **both the requesting and the requested country**.
3. **Rule of Speciality:** The extradited individual can only be tried for the offense for which they were extradited.
4. **Fair Trial Assurance:** The individual must be guaranteed a **fair trial** in the requesting country.

India's Position on Extradition:

India, being a victim of transnational terrorism, particularly in the context of the **26/11 Mumbai attacks**, has been actively pursuing the **extradition of accused terrorists** from foreign jurisdictions. The **Ministry of External Affairs** plays a pivotal role in coordinating with foreign governments, utilizing treaties, and diplomatic channels to bring fugitive criminals to justice.

International Criminal Court (ICC)

Context: The **Ukrainian parliament** has voted in favor of joining the **International Criminal Court (ICC)**, signaling a commitment to international law and accountability, especially given the context of the ongoing conflict with Russia.

About the ICC:

1. Nature:

- The ICC is an **independent judicial body** that is **not part of the United Nations**. It functions separately but cooperates with the UN on various matters.

2. Jurisdiction:

- The ICC may exercise jurisdiction over individuals charged with **genocide, crimes against humanity, war crimes, and the crime of aggression.**
- The court deals primarily with crimes of the most serious concern to the international community.

3. Governance:

- Although it is **not a UN body**, the ICC is governed by the **Rome Statute**, a treaty that was **negotiated within the UN** and adopted in 1998.
- The **UN Security Council** can refer certain cases or situations to the **ICC Prosecutor**, even if the country involved is not a member of the ICC.

4. Relationship with the UN:

- The **International Court of Justice (ICJ)**, unlike the ICC, is the **principal judicial organ of the United Nations** and deals primarily with disputes between states, whereas the ICC prosecutes individuals for international crimes.

5. Membership:

- As of now, **124 countries** are members of the ICC.
- Notably, **India, China, Russia, and the United States** are **not members** of the ICC, reflecting political and strategic considerations regarding sovereignty and international jurisdiction.

India and Poland Elevate Ties to Strategic Partnership

Context: During the Prime Minister of India's official visit to Poland, the two nations agreed to elevate their ties to a **Strategic Partnership**, marking **70 years of diplomatic relations.**

Key Highlights of the Official Visit:
1. Five-Year Action Plan (2024-2028):

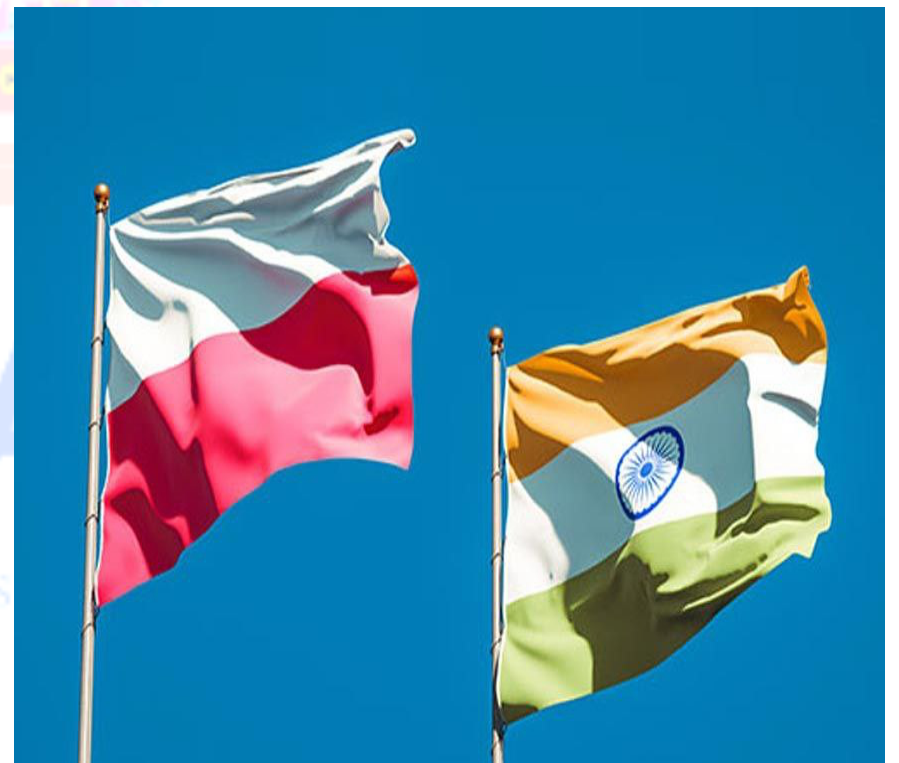
- Both countries agreed to implement a **five-year action plan** to strengthen the strategic partnership.

2. Social Security Agreement:

- Agreement to protect the interests of **cross-border workers** through a **social security pact.**

3. Jam Saheb of Nawanagar Youth Exchange Program:

- **India** will start a **youth exchange program** to commemorate the efforts of **Maharaja Jam Saheb Digvijaysinhji**, who sheltered displaced **Polish children** during **World War II.**


India-Poland Relations:
1. Political Relations:

- Diplomatic relations were established in **1954**, with India opening its embassy in **Warsaw** in **1957.**

2. Economic & Commercial Relations:

- **Poland** is India's largest trading and investment partner in **Central and Eastern Europe**, with bilateral trade reaching **US\$6 billion** in **2023.**

3. Sectoral Collaboration:

- Cooperation spans areas like **mining** (e.g., training provided to **Coal India Limited** trainees in Polish mines) and **pharmaceuticals.**

4. Cultural and Educational Relations:

- Poland has a strong tradition in **Indology studies**, with a cultural focus on **Yoga** and the **Good Maharaja Connection** honoring **Maharaja Jam Saheb Digvijaysinhji.**



Five-Year Action Plan for Strategic Partnership (2024-2028):

1. **Trade and Investment:** The **Joint Commission for Economic Cooperation** will meet at least **twice every five years** to boost trade and investment ties.
2. **India-EU Cooperation:** The partnership will focus on concluding **India-EU trade and investment negotiations** and operationalizing the **India-EU Trade and Technology Council**.
3. **Counter-Terrorism:** Both nations will cooperate in **designating individuals** affiliated with groups listed by the **UNSC 1267 Sanctions Committee**.
4. **Other Areas of Cooperation:** Expanded cooperation in **cybersecurity, circular economy, waste-water management**, and other emerging fields.

Orangutan Diplomacy

Context: Malaysia revised its controversial “**Orangutan diplomacy**” policy, initially proposed by the **Plantation and Commodities Minister**, following widespread criticism from wildlife conservationists.

Original Plan:

- **Proposal:** Malaysia suggested **gifting endangered orangutans** to countries that purchased **Malaysian palm oil**, drawing inspiration from China's “**panda diplomacy.**”
- **Criticism:** The policy was widely criticized as **hypocritical** and harmful to **wildlife conservation**, especially since **palm oil production** is linked to **deforestation**, threatening **orangutan habitats**.

Revised Approach:

- **Sponsorship:** Instead of sending orangutans abroad, **palm oil importers** will be offered the chance to **sponsor orangutans**.
- **Conservation Efforts:** The sponsorship funds will be directed towards **conservation efforts** within Malaysia, ensuring that orangutans remain in their **natural habitats**.



Significance:

This revised strategy aims to show Malaysia’s commitment to **sustainable palm oil production** and **environmental conservation**. It comes in response to **growing international pressure**, including the **European Union’s ban** on imports linked to **deforestation**, while attempting to align Malaysia's policies with global conservation efforts.

ECONOMY

Kakrapar Atomic Power Plant (KAPP-4)

Kakrapar Atomic Power Plant (KAPP-4), located in Gujarat, is a crucial part of India's nuclear power strategy under its three-stage nuclear program, designed by **Dr. Homi Jehangir Bhabha** to accommodate India's limited uranium resources. On August 22, 2024, KAPP-4, a **700 MWe Pressurized Heavy Water Reactor (PHWR)**, started working at full capacity. This development is part of India's ongoing push towards increasing its nuclear power capacity, with an additional 14 such units expected by 2031-32.



Three-Stage Nuclear Programme:

- Stage 1:** Natural uranium-fueled **Pressurized Heavy Water Reactors (PHWR)**.
- Stage 2:** **Fast Breeder Reactors (FBRs)** using plutonium and uranium.
- Stage 3:** **Advanced nuclear power systems** using thorium and uranium mixtures.

KAPP-4 operates using natural uranium as fuel and heavy water as a moderator. It first achieved criticality in 2023, which is essential for sustaining a controlled chain reaction.

Key Technological and Safety Enhancements:

- Thermal Margin:** The 700 MWe PHWR design addresses excess thermal margins, meaning the reactor operates at a temperature below its maximum, enhancing safety.
- Safety Features:**
 - Thin-Walled Pressure Tubes:** Designed to lower the severity of accidental ruptures, ensuring containment integrity.
 - Passive Decay Heat Removal System:** Capable of removing decay heat from the reactor core without operator intervention, minimizing risk in emergency situations.
 - Fukushima-Level Safety Protocols:** Enhanced to prevent accidents similar to the **Fukushima disaster of 2011**.
 - Containment Systems:** Steel-lined containment and spray systems designed to reduce leakages and pressure in case of a **Loss of Coolant Accident (LOCA)**.

Significance:

- Energy Security:** Expanding nuclear power capacity is vital for India's energy security, reducing reliance on fossil fuels.
- Safety Enhancements:** Incorporation of advanced safety measures reflects lessons learned from global incidents like **Fukushima**, pushing India's nuclear reactors into the **Generation III+** category.
- Future Prospects:** With the addition of 14 more PHWR units by 2031-32, India's nuclear power program is set to play a crucial role in its sustainable energy future.

Framework for Recognition of Self-Regulatory Organisations in Financial Markets (SROs)

- The **Reserve Bank of India (RBI)** introduced a **framework** for recognizing **Self-Regulatory Organisations (SROs)** in financial markets. This initiative aims to promote **self-regulation** among industry members to address

the growing complexity and scale of **regulated entities (REs)**, while reducing the burden on regulatory bodies like **RBI** and **SEBI**.

About the Self-Regulatory Organisations (SROs) Framework

1. **Eligibility:**
 - The SRO must be established as a **not-for-profit company** under **Section 8** of the **Companies Act, 2013**.
 - The applicant must have a **minimum net worth of INR 10 crore**.
2. **Responsibilities:**
 - **Report to RBI:** Inform the RBI regularly about developments in the sector.
 - **Assignments from RBI:** Carry out any tasks assigned by the RBI.
 - **Annual Report:** Submit an **Annual Report** to the RBI detailing activities and compliance.
3. **Purpose:**
 - **Develop and Promote Industry Standards:** SROs will formulate **industry standards** and **best practices** to ensure better governance and regulatory compliance.
 - **Enhance Self-Regulation:** By promoting self-regulation, SROs aim to reduce reliance on external regulators and foster industry accountability.

About Regulated Entities (REs)

1. **Definition:**
 - **Regulated Entities (REs)** refer to **financial institutions** and organizations that operate under specific regulations set by governing bodies like the **RBI** and **SEBI**.
2. **Role of REs:**
 - **Maintaining Financial Stability:** REs play a crucial role in ensuring **financial stability** through compliance with regulations.
 - **Regulatory Compliance:** They are responsible for adhering to regulations, conducting **due diligence**, and implementing measures to prevent financial crimes, such as **money laundering** and **fraud**.
3. **Examples of REs:**
 - **Insurance Repositories** under the **Insurance Regulatory and Development Authority (IRDA)**.
 - **Scheduled Commercial Banks** under the **RBI**.

Rapid Innovation and Start-up Expansion (RISE) Accelerator

- **Atal Innovation Mission (AIM)**, in collaboration with **CSIRO, Australia**, has opened applications for the **Climate Smart Agritech cohort** of the **India-Australia RISE Accelerator**.

About RISE Accelerator:

1. **Launch:**
 - The **RISE Accelerator** was launched in **2023**.
2. **Purpose:**
 - The program is designed to support **businesses from India and Australia** in **international expansion**, providing a platform to **validate, adapt, and pilot technologies** for new markets.
3. **Focus Themes:**
 - **Climate Smart Agriculture**
 - **Clean Energy**
 - **Circular Economy and Waste Management**
 - **Climate Smart Mobility**

UN Adopts Terms of Reference for a Framework Convention on International Tax Cooperation

- The UN's **Ad Hoc Committee** has approved the **Terms of Reference** for a **United Nations Framework Convention on International Tax Cooperation**, setting the stage for the creation of a **UN Global Tax Treaty**.

Objectives of UN Global Tax Convention:

1. **Strengthening International Tax Cooperation:**
 - Aims to establish a **legitimate, fair, stable, inclusive, and effective international tax system** that promotes cooperation among nations.
2. **Addressing Tax Challenges:**
 - Focuses on tackling **digitalization** and the **global operations** of large **Multinational Corporations (MNCs)**.
 - Mobilizes **domestic resources** and promotes **sustainable development** through effective tax policies.
3. **Supporting Global Agendas:**
 - Seeks to accelerate the implementation of the **Addis Ababa Action Agenda on Financing for Development** and the **2030 Agenda for Sustainable Development Goals (SDGs)**.

Key Commitments of the UN Global Tax Convention:

1. **Fair Allocation of Taxing Rights:**
 - Advocates for the **equitable taxation of MNCs** by ensuring a fair distribution of taxing rights among countries.
2. **Addressing Illicit Financial Flows:**
 - Aims to combat **tax evasion, tax avoidance, and illicit financial flows** by **high-net-worth individuals**.
3. **Cross-Border Services:**
 - Proposes to address taxation issues related to **income derived from cross-border services**.
4. **Mutual Administrative Assistance:**
 - Seeks to establish frameworks for **mutual administrative assistance** in tax matters and create mechanisms for the **resolution of tax disputes**.

Global Perspective:

Developing countries, including **India**, largely voted in favor of the treaty's terms of reference, while **industrialized nations** like **Australia, Israel, Japan, the UK, and the USA** opposed it.

Other Global Initiatives:
OECD Global Minimum Tax:

- Based on the **Global Anti-Base Erosion Model Rules**, this initiative mandates that **MNCs** pay a **minimum tax rate of 15%** on corporate profits in each jurisdiction where they operate, thereby reducing incentives for **profit shifting**.

Radical Changes in Inflation Targeting Regime Could Be Counterproductive: NCAER

- The **National Council for Applied Economic Research (NCAER)** recently released a working paper titled "**Inflation Targeting in India: A Further Assessment**," evaluating India's inflation-targeting regime after 8 years of implementation.

Inflation Targeting Regime in India:

1. **Primary Objective:**
 - The regime's main aim is to maintain **price stability**, while considering the objective of **economic growth**.
2. **Introduction:**
 - Launched in **2015** through a **Monetary Policy Framework Agreement** between the **Union Government** and the **Reserve Bank of India (RBI)**.
 - In **2016**, the **RBI Act** was amended, providing a statutory basis for the **Monetary Policy Framework** and the creation of the **Monetary Policy Committee (MPC)**.
3. **Inflation Target:**
 - The **RBI** is tasked with targeting **Consumer Price Index (CPI) inflation** at **4%**, with a tolerance band of **±2%** (i.e., 2-6%). This target is reviewed every **5 years**.
4. **Monetary Policy Committee (MPC):**
 - The **MPC** consists of **6 members**: **3 ex-officio members** from the **RBI** and **3 external members** appointed by the **Union Government**.

Headline vs. Core Inflation:

1. Headline Inflation:

- Reflects inflation based on the **CPI-Combined** and includes **food, fuel,** and all other commodities.
- It measures the **total price rise** in the economy.

2. Core Inflation:

- Excludes **more volatile items** like **food and fuel**, focusing on more stable price changes in other commodities.

Key Findings of the Paper:

1. Broadening the Mandate of RBI:

- Expanding the **RBI's responsibilities** (e.g., corporate bond market development) could divert focus from achieving **price stability**, which may reduce the **accountability** of the central bank.

2. Core Inflation vs. Headline Inflation:

- Shifting the focus solely to **core inflation** (excluding food and fuel) could **neglect food price inflation**, which can lead to **negative consequences** in an economy like India, where food prices play a significant role.

Online Portals for Power Sector

- The Union Minister of Power recently launched **three online portals** to enhance the efficiency and monitoring of India's power sector.

About the Portals:

1. Portal DRIPS (Disaster Resilient Infrastructure for Power Sector):

- **Objective:** To serve as a **single point of contact** for all stakeholders managing the **inventory of critical Power System equipment and supplies** to ensure disaster resilience in the power sector.

2. Jal Vidyut Detailed Project Report (DPR) Portal:

- **Objective:** For **monitoring survey and investigation activities** of **Hydro Electric Projects and Pumped Storage Projects** to enhance the efficiency of project execution.

3. Portal for Online Monitoring Of Projects – Thermal (PROMPT):

- **Objective:** To facilitate **real-time tracking and analysis** of **thermal power projects**, ensuring timely implementation and addressing any issues during the project lifecycle.

Jan Poshan Kendras

- The Union Minister of Consumer Affairs, Food, and Public Distribution launched a pilot project to transform **60 Fair Price Shops (FPS)** into **Jan Poshan Kendras**.

About Jan Poshan Kendras:

- **Objective:** The Kendras aim to provide **nutrition-rich food items** to consumers while offering an **additional income source** to the FPS dealers.
- **Requirements:** Kendras are required to store **50% of products** under the category of **nutrition**, with the remaining 50% allotted for **other household items**.
- **Pilot States:** The project will initially cover **Gujarat, Rajasthan, Telangana, and Uttar Pradesh**.

Surety Bond

Context: The **Insurance Regulatory and Development Authority of India (IRDAI)** has set up a **task force** to address challenges and promote the growth of **surety bond insurance** in India.

What is a Surety Bond?

A **surety bond** is a **risk transfer mechanism** where an **insurer** guarantees to a **beneficiary** (or obligee) that the **principal** (often a contractor) will fulfill their contractual obligations.

Three Parties Involved:

1. **Principal:** The person or entity (such as a contractor) who needs to meet certain obligations.
2. **Obligee:** The government entity or individual requiring the surety bond, ensuring the principal fulfills the contract.
3. **Surety:** The **insurer** providing the financial guarantee to the obligee on behalf of the principal.

Significance:

- Unlike traditional **bank guarantees**, **surety bonds** offer a **more efficient and comprehensive solution**, particularly useful in sectors like **construction** and **infrastructure**, where they help manage **contractual risks** more effectively.

Creative Economy

Context: The **Indian Chamber of Commerce (ICC)** launched the **All India Initiative on Creative Economy (AIICE)** to provide a platform for India's creative industries to collaborate on matters related to the **creative economy**.

About Creative Economy (or Orange Economy):

- **Definition:** The creative economy is an evolving concept based on the **interplay between human creativity, ideas, intellectual property, knowledge, and technology**.
- **Key Sectors:** Includes **advertising, architecture, arts and crafts, design, fashion, performing arts, electronic publishing, and other creative industries**.

Status in India:

- **Worth:** India's creative economy is valued at **\$30 billion**.
- **Employment:** It employs **8% of the working population**, demonstrating its significant role in the Indian economy.

Significance:

The **AIICE** aims to strengthen India's **creative sectors**, fostering innovation, collaboration, and growth across various industries that contribute to the nation's **cultural and economic development**.

Input Tax Credit (ITC)

- The Directorate General of GST Intelligence (DGGI) detected **tax evasion** worth **Rs 1.2 trillion** due to **fake Input Tax Credit (ITC)** frauds since 2020.

About Input Tax Credit (ITC):

- **ITC** is a mechanism under the **Goods and Services Tax (GST)** system that allows businesses to **claim credit** for the **GST already paid** on purchases for business use.
- The credited amount can then be used to **offset the GST payable** on the sale of goods or services, preventing the cascading effect of taxes.

Five Years of Jal Jeevan Mission



Context: Launched in **2019**, the J provide **Functional Household Tap Connections (FHTCs)** to all **rural households** by **2024**, ensuring a service level of **55 litres per capita per day**.

Key Achievements:

- **Tap Water Coverage:** Increased from **3.23 Crore** to around **15 Crore households**.
- **100% Coverage:** Achieved by **8 states** and **3 Union Territories**.
- **Schools & Anganwadi Centres:** **88.91%** of schools and **85.08%** of Anganwadi centres now receive tap water.

- **'Har Ghar Jal' Status:** **2.28 lakh villages** and **190 districts** have achieved this status.

About Jal Jeevan Mission:

- **Background:** Evolved from the **National Rural Drinking Water Programme** and now operates under **Ministry of Jal Shakti**.
- **Type:** A **Centrally Sponsored Scheme**.
- **Women Empowerment:**
 - Half of the members of **Village Water & Sanitation Committees** must be **women**.
 - Around **24.59 lakh women** have been trained to test water samples using **Field Testing Kits (FTKs)** for ensuring water quality.



GEOGRAPHY

Kosi-Mechi River Linking Project: Controversy and Concerns

- **Kosi-Mechi River Linking Project** faces protests in Bihar, with locals arguing it fails to address **flood control**, a critical issue in the region.

Key Facts About the Kosi-Mechi River Linking Project:

- **Objective:** Link **Kosi River** with **Mechi River** to provide irrigation for **4.74 lakh hectares** (2.99 lakh hectares in Bihar).
- **Water Supply:** 24 million cubic meters (MCM) for domestic and industrial use.
- **Flow Increase:** 5,247 cusecs additional water release from Kosi barrage.
- **Overseen by:** **National Water Development Agency (NWDA)** under the Ministry of Jal Shakti.
- **Concerns:**
 - **Flood Control Neglect:** Small water flow increase insufficient to prevent annual flooding.
 - **Impact on Livelihoods:** Floods destroy crops and homes, yet the project focuses mainly on irrigation.



Key Facts About Kosi and Mechi Rivers:

- **Kosi River:** Known as the "**Sorrow of Bihar**," originating from the Himalayas and prone to frequent westward shifts, causing massive land erosion.
- **Mechi River:** **Perennial trans-boundary river**, flows through Nepal and Bihar, and joins the **Mahananda River**.

Way Forward:

- **Floodplain Zoning:** Restrict settlements in high-risk areas; promote **flood-resistant housing** and cropping patterns.
- **Strengthen Embankments:** Along Kosi River to reduce flood risks.
- **Equitable Distribution:** Ensure fair benefits between flood-prone and water-scarce areas.
- **Alternative:** Consider the **National Waterways Project (NWP)**, using excess floodwaters, as a cost-effective solution to avoid interstate disputes.

National Perspective Plan for Interlinking Rivers (NPP):

- **Established in 1980:** To manage water resources through inter-basin water transfers.
- **Components:**
 - **Himalayan Rivers Development**
 - **Peninsular Rivers Development**
- **Key Projects:** Kosi-Mechi Link, Ken-Betwa Link, Mahanadi-Godavari Links.
- **Significance:**
 - **Flood Management** in Ganga-Brahmaputra basin.
 - **Irrigation** in water-scarce regions to boost agriculture and food security.
 - **Inland Waterways** development for freight movement.

Challenges of the NPP:

- **Feasibility Gaps:** Incomplete studies on economic, social, and ecological impacts.
- **State Disputes:** Water being a state subject complicates sharing agreements.
- **Climate Impact:** Changing rainfall patterns may undermine project goals.
- **Cost:** High expenses for infrastructure construction and maintenance.

Waterspout Incident off the Coast of Sicily

What is a Waterspout?

A **waterspout** is a column of rotating, cloud-filled wind that forms over a water body, such as an ocean or a lake. Despite its name, it does not carry water from the body of water beneath it. Instead, it forms when air descends from a **cumulus cloud**, and the water inside the waterspout is a result of **condensation** occurring within the cloud.

Types of Waterspouts:

1. Tornadic Waterspouts:

- The most **powerful and destructive** type.
- Similar in intensity to tornadoes, these waterspouts can cause significant damage if they move onto land.

2. Fair-Weather Waterspouts:

- **Rarely dangerous** and typically less destructive.
- Often form in calm weather and are generally short-lived.

Conditions for Formation:

- **High Humidity:** Essential for the development of condensation in the cumulus clouds.
- **Warm Water Temperatures:** Relatively warmer water compared to the cooler overlying air helps trigger the formation of waterspouts.

Regions for Formation:

- Waterspouts are most common in **tropical and subtropical waters**, where **high humidity** and **warm water temperatures** are prevalent. These regions provide the optimal conditions for waterspout formation.



ENVIRONMENT & ECOLOGY

Panama Canal Facing Climate Change-Induced Challenges

- The **Panama Canal**, a key global shipping route, is grappling with severe **drought conditions** due to **climate change**, affecting its operations and global trade.

Impact of Climate Change on the Panama Canal:

- Drought and Reduced Ship Passage:**
 - Drought** began in early 2023, with **rainfall in October 2023** being **43% below average**, marking the **driest October since the 1950s**.
 - Ship traffic** decreased to **22 ships per day** in December 2023, down from the usual **36-38 ships** due to low water levels in **Lake Gatun**.
- Size Restrictions on Ships:**
 - Low water levels** limit the size of ships that can safely pass through, as larger vessels require more water to lift them in the locks.
- Effect on Global Trade:**
 - The **Panama Canal** handles **5% of global shipping**, so disruptions lead to **delayed shipments**, **increased fuel usage**, and **global GDP losses**.
 - Ships are forced to take **longer routes**, such as navigating around **South America**.

Key Facts About the Panama Canal:

- Location:** An **82 km** artificial waterway connecting the **Atlantic and Pacific Oceans** across the **Isthmus of Panama**.
- First Use:** Opened on **15th August 1914**.
- Functioning:** Operates with a **lock system** that lifts and lowers ships to navigate between the different elevations of the **Pacific and Atlantic** oceans.

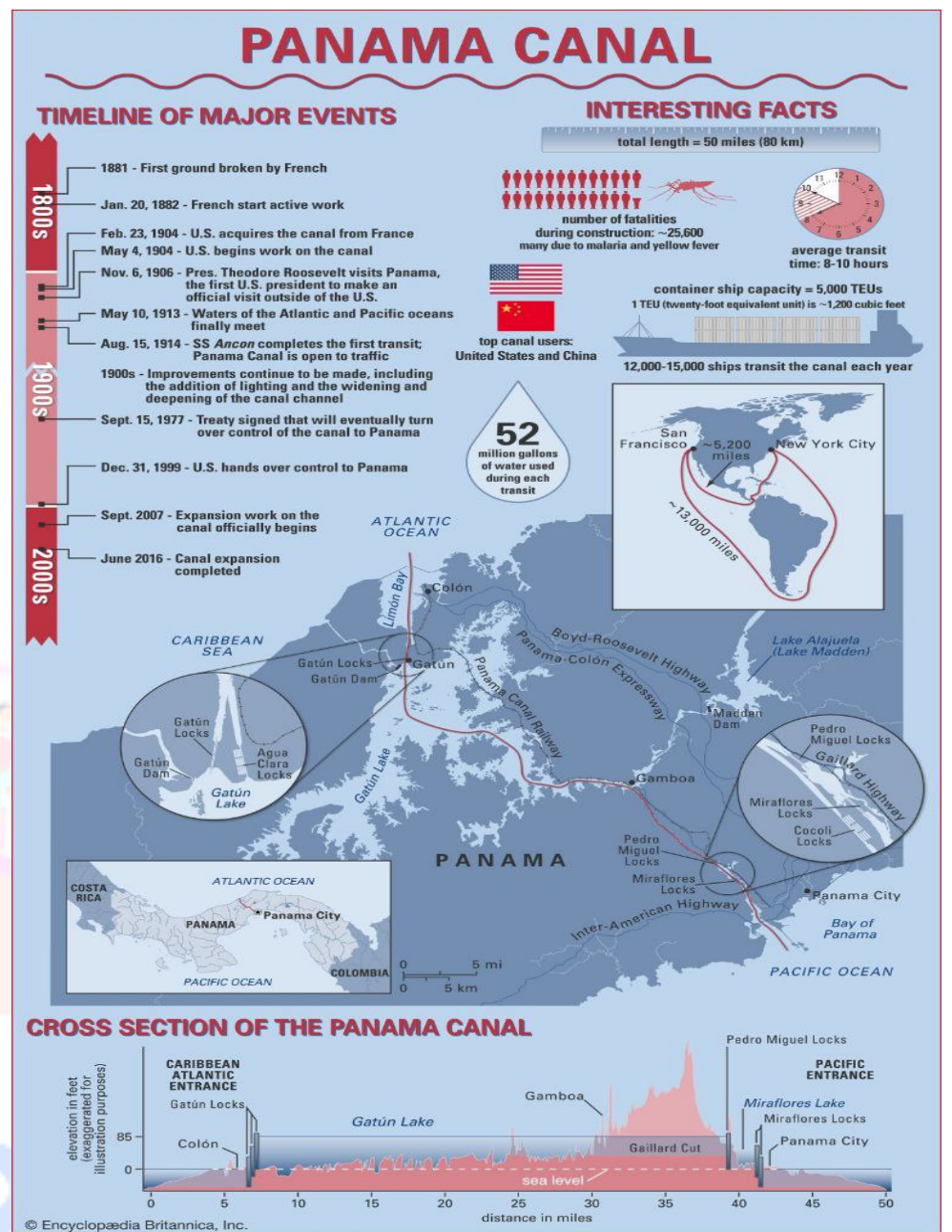


Isthmus of Panama:

- A **narrow strip of land** connecting **North and South America** while separating the **Pacific and Atlantic Oceans**.
- Formed by **tectonic activity** that raised the seafloor between the **North American and South American plates**.

Other Important Global Canals:

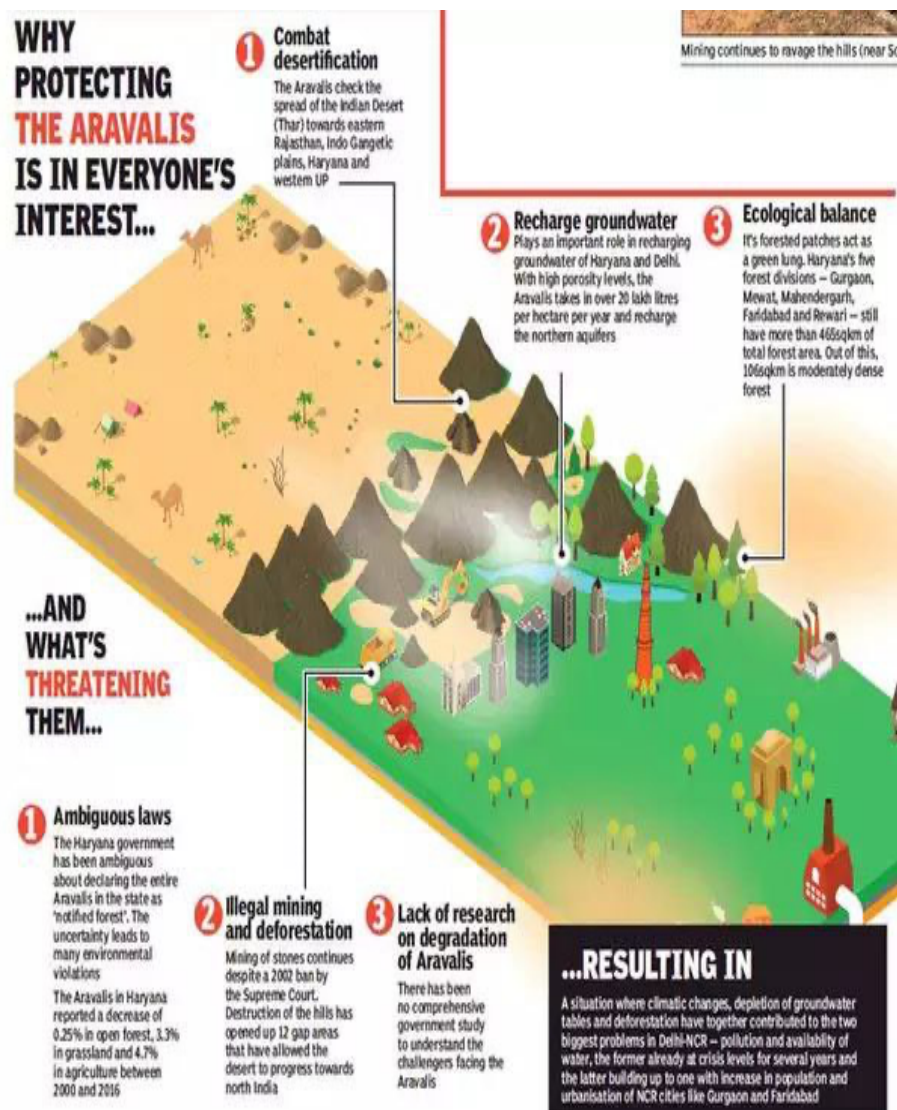
- Suez Canal:** Connects the **Gulf of Suez** with the **Mediterranean Sea**, providing the shortest route between **Europe** and regions around the **Indian Ocean**.
- Kiel Canal:** Connects the **Baltic Sea** with the **North Sea**, allowing vessels to bypass the longer route around **Denmark**.
- Corinth Canal:** The world's **narrowest canal**, connecting the **Ionian Sea** and the **Aegean Sea** in Greece.
- Kra Isthmus Canal (Proposed):** Would connect the **Andaman Sea** with the **Gulf of Thailand**, offering a shortcut for shipping between **India and China**.



5. **Great Lakes Seaway Navigation System:** A system of waterways in the **United States** that connects the **Great Lakes** with the **Atlantic Ocean** via the **St. Lawrence River**.

Study Highlights Severe Environmental Decline in the Aravalli Range

- A recent scientific study has revealed alarming **land use dynamics** in the **Aravalli Range**, showing significant **biodiversity loss**, **soil degradation**, and **reduced vegetation cover** due to ongoing destruction of the hills.



Key Challenges Highlighted in the Study Regarding the Aravalis:

- 1. Loss of Hills:**
 - Between **1975 and 2019**, **8%** of the Aravalli hills (5,772.7 sq km) have disappeared.
 - The **Thar desert** is expanding towards the **National Capital Region (NCR)**, causing **desertification**, increased **pollution**, and **erratic weather**.
- 2. Increase in Mining Area:**
 - Mining areas have increased from **1.8% in 1975 to 2.2% in 2019**.
 - Over **25%** of the Aravalis have been lost due to **illegal quarrying**, contributing to **air pollution** in the NCR.
- 3. Increase in Human Settlements:**
 - Human settlements expanded from **4.5% in 1975 to 13.3% in 2019**.
- 4. Forest Cover Loss:**
 - The central range saw a **32% drop in forest cover** between 1975 and 2019, while cultivated land rose.
 - Deforestation rate** during this period was **0.57% annually**.
- 5. Impact on Water Bodies:**
 - Water bodies** grew from **1.7% in 1975 to 1.9% in 1989**, but have declined due to **illegal mining**, which has **punctured aquifers** and disturbed water flow.
- 6. Protected Areas:**
 - Todgarh-Raoli** and **Kumbhalgarh wildlife sanctuaries** have positively impacted the **eco-sensitive zone**, resulting in **minimal forest depletion**.
- 7. Future Projections:**
 - By **2059**, **22%** of the Aravalli area is projected to be lost, with **3.5%** of the total area expected to be used for **mining**.
- 8. Decline in Flora and Fauna:**
 - Species like **leopards**, **striped hyenas**, and **golden jackals** are experiencing sharp population declines.

Enhanced Vegetation Index (EVI):

- EVI** measures **vegetation health**, ranging from **0 to 1**, with values closer to **0** indicating **unhealthy vegetation**. The **upper central Aravalli region** (Nagaur district) shows an **EVI value of 0 to -0.2**, signaling **unhealthy vegetation**.

Key Facts About the Aravallis:
1. Geography:

- The **Aravalli Range** extends from **Gujarat to Delhi**, spanning **692 km** in length.
- It acts as a **natural barrier** against the expansion of the **Thar Desert** and plays a vital role in **groundwater recharge** and **air quality** in **Delhi-NCR**.

2. Biodiversity:

- Supports **300 plant species**, **120 bird species**, and unique wildlife like **jackals and mongooses**.
- The **Gurusikhar peak** in Rajasthan is the highest point at **1,722 meters**.

3. Environmental Significance:

- The Aravallis serve as the “**lungs**” of **Delhi-NCR**, absorbing pollution and mitigating the desert's encroachment.


Supreme Court’s Rulings and Legal Notifications:
1. Supreme Court Orders:

- **1996, 2002, 2009, 2018:** Bans on mining activities in the Aravallis due to environmental degradation and illegal construction activities.

2. Precautionary Principle:

- Established in **1996**, the principle mandates that governments prevent environmental degradation without waiting for conclusive scientific proof.

3. National Green Tribunal (NGT):

- Adopts the **precautionary principle** for decision-making on environmental issues under the **NGT Act of 2010**.

Way Forward:
1. Aravalli Green Wall Project:

- Develop a **1,400 km green belt** along the Aravalli range to rejuvenate **75 water bodies** and restore degraded land.

2. Restoration Models:

- Emulate successful projects like the **Gurgaon biodiversity park**, involving **local volunteers and ecologists**.

3. Legal Enforcement:

- Strengthen the implementation of **Supreme Court rulings** and enforce **zoning laws** to prevent further encroachment and mining.

4. Empowering Regulatory Bodies:

- Strengthen the **Aravalli Rejuvenation Board** to address illegal mining and environmental degradation effectively.


Uttarakhand Becomes 1st State to Assign Monetary Values to Natural Resources

- **Uttarakhand** has become the first state in India to assign **monetary values** to its **natural resources** such as **air, water, forests, and soil**, introducing the concept of **Gross Environment Product (GEP)**.

What is Gross Environment Product (GEP)?
1. Definition:

- **GEP** is a component of **Green GDP**, measuring the **value of the ecosystem's products and services** that contribute to **human welfare** and **sustainable economic and social development**.

- It encompasses **provisioning, regulating, and cultural ecosystem services**.
2. **Relation to Green GDP:**
- Green GDP** is an economic growth indicator that accounts for **environmental factors**, such as **biodiversity losses** and **climate change costs**, alongside traditional GDP.
 - GEP** serves as a specific measure within **Green GDP**, focusing on the environment's contribution to the economy.
3. **GEP Index:**
- The **GEP Index** assigns values to **natural processes** such as **rain**, as well as **man-made conservation efforts** like **Amrit Sarovars** (water bodies created under the government's initiative).
 - The **GEP Index** compares data over time, showing a **0.9% increase** in environmental products created between **2020 and 2022**.

Significance:

- This initiative emphasizes the need to **recognize and value natural resources** as key contributors to the economy, promoting a more **sustainable approach** to development and environmental conservation.

New Study Assesses Suitability of Banni Grassland for Sustainable Restoration

- A recent study has evaluated the **suitability** of various areas within the **Banni Grassland** for **sustainable restoration**, considering **ecological value** as the primary criterion. The study analyzed **soil characteristics** (nutrients and micronutrients) using **satellite data** to guide the restoration process.

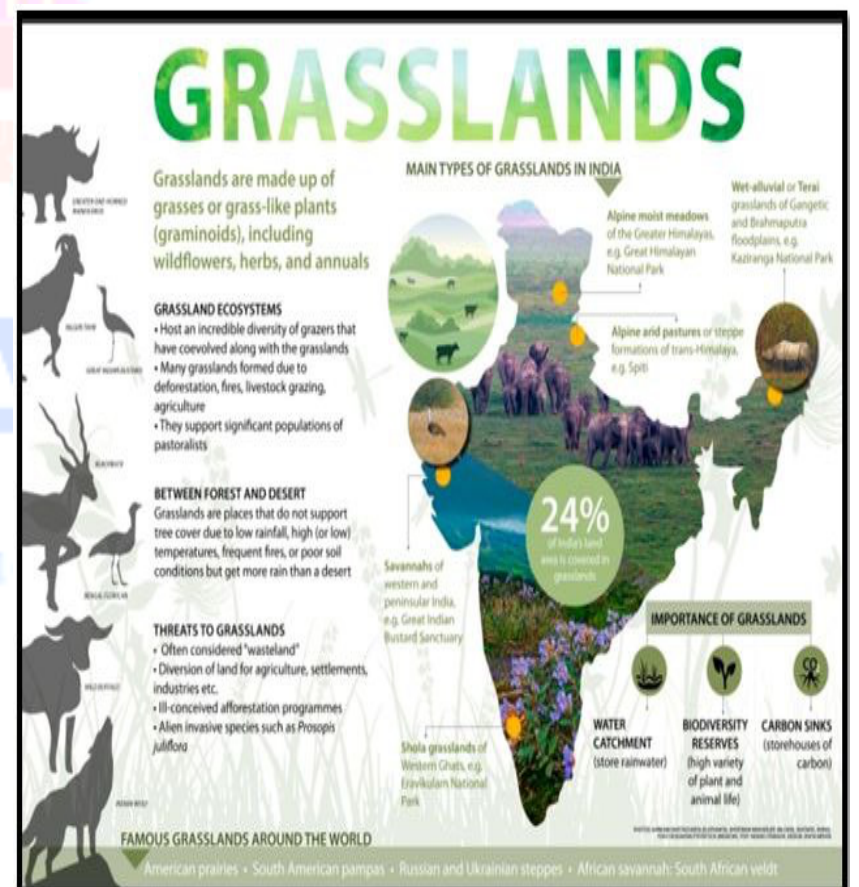
Findings of the Study

1. Restoration Zones:

- The study divided Banni grassland into **five categories** based on restoration suitability:
 - 36%** of the grassland area was classified as **highly suitable** for restoration.
 - 28%** was deemed **suitable**.
 - 27%** was **moderately suitable**.
 - 7%** was **marginally suitable**.
 - 2%** was considered **not suitable** for restoration.

2. Restoration Strategies:

- Highly suitable and suitable zones:** Can be restored with adequate **water sources**, such as **irrigation** or **rainwater harvesting**.
- Marginally suitable and not suitable zones:** Require **terracing, fertilization,** and protection from **water erosion** and **salt intrusion** to enhance restoration efforts.



About Banni Grassland (Kutch, Gujarat)

- Asia's largest tropical grassland**, spanning **2,600 sq. km**, formed from **tectonic activities**.
- Flora and Fauna:** Home to **Banni buffalo, Kankrej cattle, Asiatic wild ass, camels, and horses**.
- Cultural Significance:** Inhabited by more than **20 ethnic semi-nomadic communities**, including the **Maldharis and Jats**.
- Ecosystem Services:** Provides **carbon storage, climate mitigation,** and **pollination** services.
- Chir Batti Phenomenon:** Known for **strange dancing lights** (Chir Batti or Ghost Lights) visible at night.

Threats Faced by Banni Grasslands

1. **Livestock Grazing:** Excessive pressure from grazing is damaging the grasslands.
2. **Soil Salinity:** Increasing salinity has led to the invasion of *Prosopis juliflora*.

Water Scarcity: Aridity, climate change, and desertification exacerbate water scarcity

Steps Taken for Grassland Restoration in India

1. **Land Degradation Neutrality Commitment:** India aims to restore **26 million hectares** of degraded land by **2030**.
2. **Cheetah Introduction Project:** Aims to restore **open forests and savannah grasslands**.
3. **Protected Areas:** Establishment of **national parks, wildlife reserves, and other protected areas**.
4. **Banni Grassland Restoration Project (2019):** Focuses on restoring the grassland ecosystem in Banni.

Melting Permafrost Releasing Toxic Mercury into the Arctic: Study

- A recent study has revealed that **melting permafrost** is releasing **toxic mercury** into the **Arctic**, particularly along eroding riverbanks in the **Yukon River**. Researchers compared **samples** from the top three meters of permafrost with **satellite data** and discovered significant amounts of mercury being released due to the erosion.

About Permafrost

1. Definition:

- **Permafrost** refers to ground that remains **frozen** at or below **0°C** for at least **two consecutive years**.
- It consists of a combination of **soil, rocks, and sand** held together by **ice**.

2. **Location:** Commonly found in **high mountain regions** and along **Earth's higher latitudes**, such as the **Arctic and Antarctica**.

3. **Characteristics:** **Permafrost regions** are not always covered in **snow**, even though the ground remains frozen.



Melting permafrost is releasing toxic mercury into the Arctic, scientists say

Impact of Melting Permafrost

1. Greenhouse Gas Release:

◦ Thawing permafrost leads to the **decomposition of soil organic carbon**, releasing **greenhouse gases** like **carbon dioxide** and **methane** into the atmosphere.

◦ The melting releases **ancient bacteria and viruses**, posing potential **health threats** to **humans** and **animals**.

2. Health Risks:

◦ The melting releases **ancient bacteria and viruses**, posing potential **health threats** to **humans** and **animals**.

and animals.

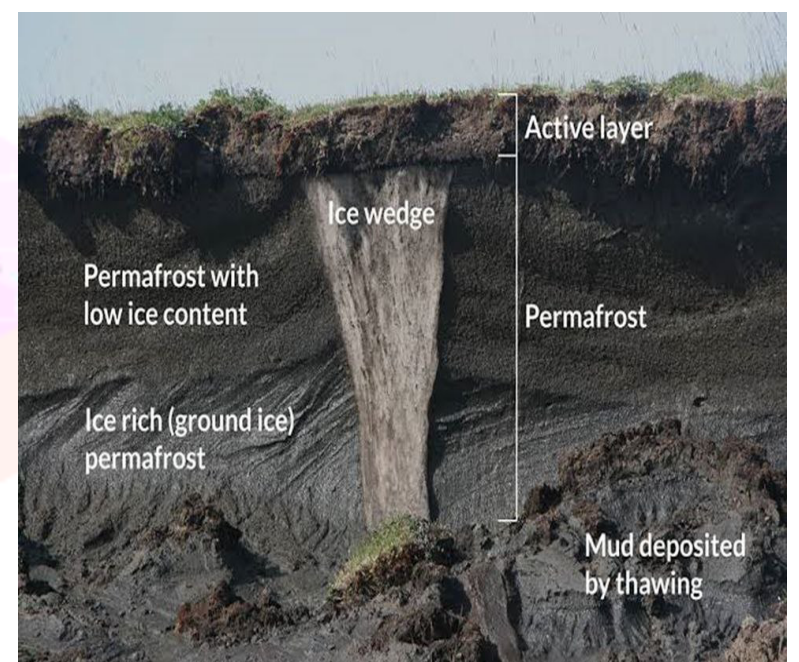
- **Toxic Mercury Release:** Mercury release threatens over **5 million Arctic inhabitants**, with serious implications for their health.

3. **Environmental Threats:** Contributes to **sea level rise**, **increased erosion**, and the risk of **landslides** in vulnerable areas.

About Mercury

1. Definition:

- **Mercury** is a **naturally occurring metal** found in the **air, water, and soil**.



ARCTIC PERMAFROST

One-fifth of frozen soils at high latitudes are thawing rapidly and becoming unstable, leading to landslides and floods that release carbon into the atmosphere.

CARBON-RICH SOIL LEVELS

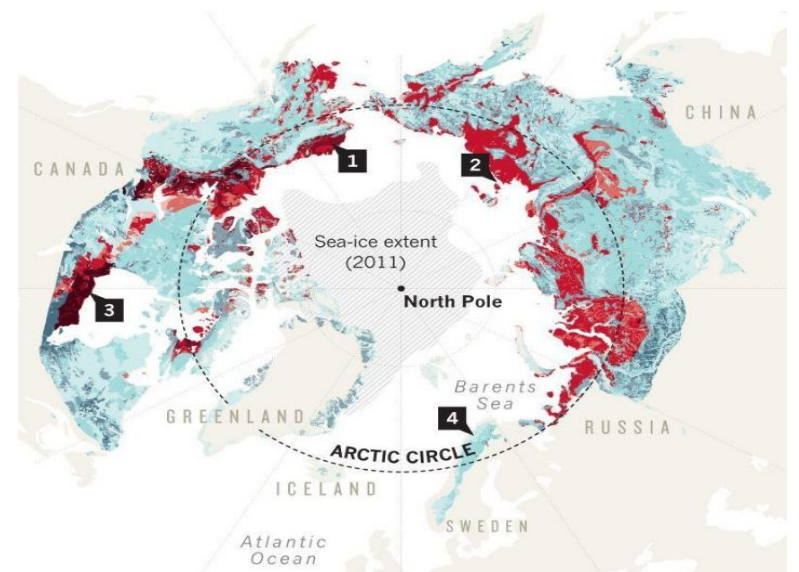
kilograms of carbon per square metre
(% of region vulnerable to type of thawing)

Rapid thawing

■ >139 (8%) ■ 139-105 (10%) ■ 104-70 (60%) ■ 69-36 (19%) ■ 35-0 (3%)

Gradual thawing

■ >139 (4%) ■ 139-105 (3%) ■ 104-70 (26%) ■ 69-36 (39%) ■ 35-0 (28%)



1 NORTH SLOPE, ALASKA, USA

Abrupt thawing is triggering landslides and eroding mountains.

2 DMITRI LAPTEV STRAIT, NORTHEAST SIBERIA

Permafrost containing thick layers of ground ice collapses suddenly when the ice melts.

3 HUDSON BAY LOWLANDS, CANADA

Thawing peatlands could release a lot of carbon.

4 TAVVAVUOMA, NORTHERN SWEDEN

Growing thaw lakes are major sources of methane.

- It is unique as the **only metal** that remains **liquid at room temperature**.
2. **Sources:**
- **Natural Sources:** Include **volcanoes, geothermal springs, geologic deposits, and oceans**.
 - **Anthropogenic Sources:** Include the **burning of coal, hazardous waste, gold mining, and industrial uses**.
3. **Health Hazards:**
- **Mercury exposure**, even in small amounts, can cause serious **health problems**, affecting the **nervous, digestive, and immune systems**.
 - **Minamata Disease**, a severe neurological disorder, is caused by **mercury poisoning**.

EU Nature Restoration Law

Context: The **EU Nature Restoration Law** recently came into force, marking a significant step towards reversing the degradation of ecosystems across the European Union.

Key Features of the Law:

- Scope:**
 - It is the **EU's first continent-wide legislation** specifically aimed at **nature restoration**.
- Main Aim:**
 - **Restore 20% of degraded ecosystems by 2030**, with the goal of restoring **all degraded ecosystems by 2050**.
- National Restoration Plans:**
 - Member States are required to prepare **National Restoration Plans by 1 September 2026**, outlining how they will meet the targets set by the law.
- Natura 2000 Network:**
 - The law prioritizes the **conservation of Natura 2000 areas**, which is a **network of protected areas** across the EU aimed at preserving natural habitats and species.

Legally Binding Targets:

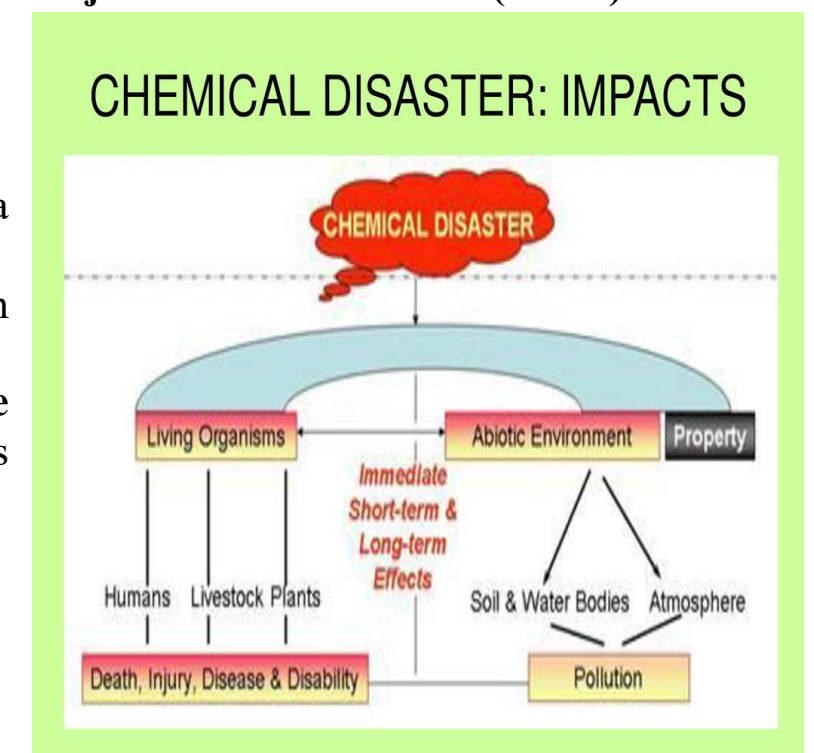
- Ecosystem Restoration:**
 - Restore **30% of terrestrial, coastal, freshwater, drained peatlands, and marine ecosystems by 2030**.
- Rivers:**
 - **Restore 25,000 km of rivers to free-flowing status**, reducing barriers and improving aquatic ecosystem health.
- Tree Planting:**
 - **Plant three billion additional trees** across the EU by **2030**, contributing to biodiversity, carbon sequestration, and ecosystem health.

Major Chemical Disaster in Anakapalli, Andhra Pradesh

Context: On August 23, 2024, a **reactor blast** in a **pharmaceutical company** in **Anakapalli, Andhra Pradesh**, was caused by a fire due to a **leaked solvent**, resulting in a major chemical disaster. This incident underscores India's vulnerability to chemical disasters, given the presence of around **1,861 Major Accident Hazard (MAH) units** and thousands of other hazardous factories.

Other Chemical Disasters in India:

- **Ammonia Gas Leak at Chennai (2024):** Occurred due to a damaged gas pipeline caused by **Cyclone Michaung**.
- **Vizag Gas Leak (2020):** Styrene gas leak at **LG Polymers** in Visakhapatnam.
- **Bhopal Gas Tragedy (1984):** Leak of **methyl isocyanate gas** from **Union Carbide plant**, one of the worst industrial disasters in history.



Indian Initiatives for Chemical Accident Prevention:

1. **NDMA Guidelines:** Direct ministries and state authorities to prepare detailed **disaster management plans**.
2. **Explosives Act 1884:** Establishes safety standards for handling, transporting, and storing explosives to **prevent accidents**.
3. **Other Laws:**
 - **Public Liability Insurance Act 1991.**
 - **Factories Act, 1948.**
 - **Occupational Safety, Health, and Working Conditions Code, 2019.**

Global Initiatives:

1. **UNEP Framework:** Provides a **flexible framework** for **Chemical Accident Prevention and Preparedness**.
2. **ILO Code of Practice (1991):** Focuses on the **prevention of major industrial accidents**.
3. **ILO Convention No. 174 (1993):** Aims at the **prevention of major industrial accidents** through international cooperation and standards.

Delhi Government to Overhaul State Action Plan on Climate Change (SAPCC)

Context: The Delhi government is revising its **State Action Plan on Climate Change (SAPCC)**, originally adopted in 2019, in response to **intensifying extreme weather** events like heat waves and record rainfall in 2024.

SAPCC Overview:

- **Purpose:** Each **State/UT** prepares a **SAPCC** to address **state-specific climate change issues** through **adaptation and mitigation** measures.
- **Context Specific:** SAPCCs consider the **ecological, social, and economic conditions** unique to each State or UT.
- **Alignment:** SAPCCs align with the **National Action Plan on Climate Change (NAPCC)**, released in 2008, which outlines India's national climate strategy.
- **Core:** NAPCC comprises **eight National Missions** focusing on various aspects of climate adaptation and mitigation.
- **Funding:** Comes through the **Climate Change Action Plan scheme**.
- **Status:** **34 States/UTs** have prepared their SAPCCs.

Barriers to Implementation:

1. **Leadership and Political Will:** Often weak due to the **top-down approach** and overlap with existing climate strategies.
2. **Lack of Specificity:** Plans are often **not clear or specific** enough to facilitate effective implementation.
3. **Resource Constraints:** States assume funding would come from the **central government** or **external sources**.

Way Forward:

1. **International Climate Finance:** Potentially cover **additional costs** for climate adaptation.
2. **Nodal Officers:** Appoint **nodal officers** in each department to address **institutional bottlenecks** and serve as focal points for climate change.
3. **Detailed Reports and Updates:** Regularly update plans and develop **detailed project reports** for clearer implementation.

Significance of State-Level Climate Strategies:

1. **Just Transition:** E.g., the **Swaniti Initiative in Jharkhand** mobilized **INR 45 Crores** for interventions related to **renewable energy and sustainability**.
2. **Integrating Climate Action:** E.g., the **Carbon Neutral Meenangadi project in Kerala** incorporates climate goals into **decentralized development**.
3. **Conservation of Mangroves and Biodiversity:** E.g., **Maharashtra's Mangrove Cell** focuses on the **conservation of mangroves and marine biodiversity**.

BIOTECHNOLOGY

Health Ministry Bans 156 Fixed Dose Combination Drugs (FDC)

Context: On August 23, 2024, the **Health Ministry** banned **156 Fixed Dose Combination (FDC) drugs** due to concerns over their **irrationality** and **potential health risks**, while safer alternatives are available. This follows previous bans of **344 FDCs in 2016** and **14 FDCs in 2023**.

About Fixed Dose Combination (FDC) Drugs:

- **Definition:** FDCs are combinations of two or more **Active Pharmaceutical Ingredients (APIs)** in fixed ratios. APIs are the **biologically active components** of drugs that produce the desired therapeutic effects.

Concerns with FDC:

1. **Physiological or Chemical Reactions:** **Opposing or antagonistic combinations** can result in **toxicity** or **reduced efficacy** of the treatment.
2. **Decreased Shelf Life:** **Chemical incompatibility** between the drugs may lead to reduced shelf life.
3. **Antibiotic Resistance:** **Unapproved or banned FDCs** containing antibiotics contribute to the growing issue of **antibiotic resistance**.

Rules Governing FDC in India:

1. **Appendix VI of Schedule Y to Drugs & Cosmetics Rules, 1945:** Specifies the requirements for approval of various FDC categories.
2. **Drug and Cosmetic (Amendment) Act, 2008 (Section 26A):** Empowers the **Central Government** to **prohibit the manufacture** and sale of drugs and cosmetics in **public interest**.

Surge in Covid-19 Cases in India Attributed to New Strains KP.1 and KP.2

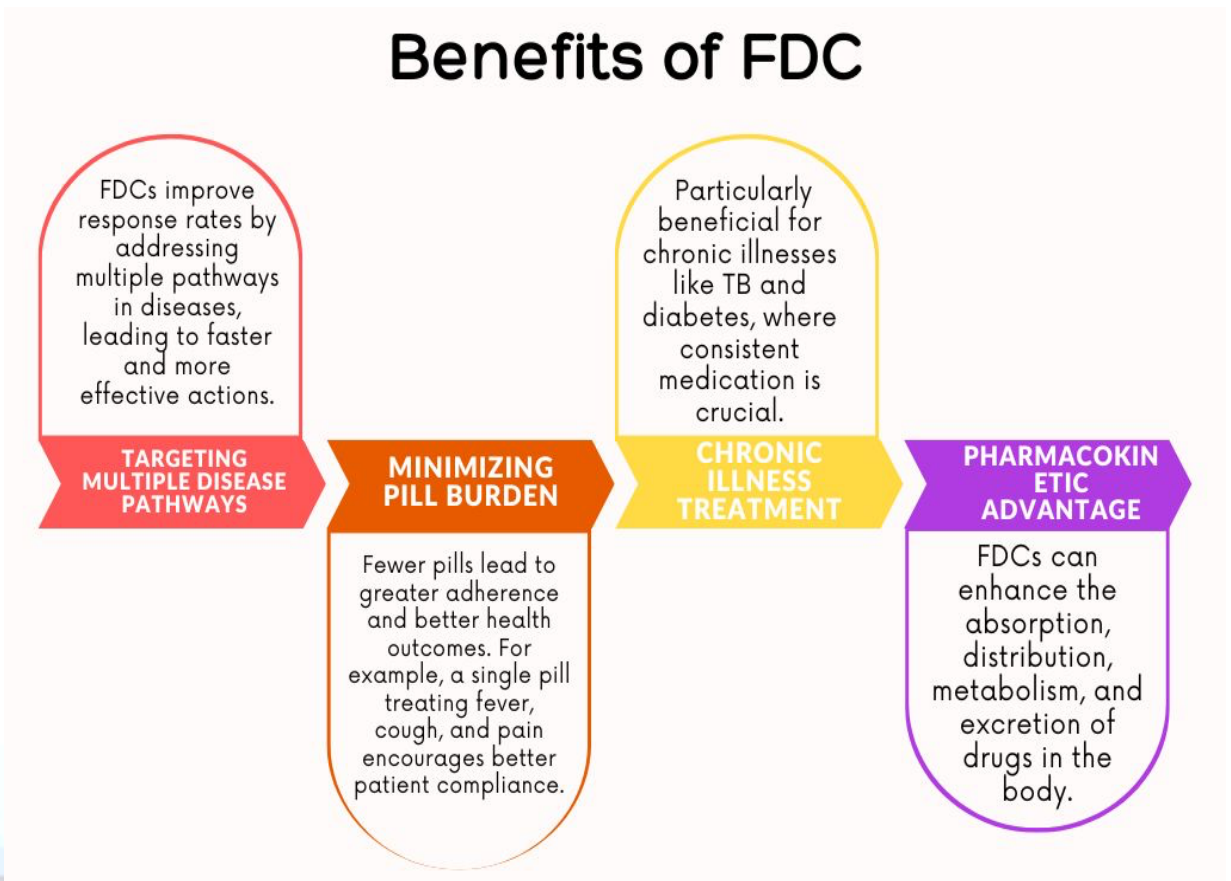
- **Recent surge in Covid-19 cases** in India linked to two strains, **KP.1** and **KP.2**, both evolved from the **JN1 Omicron variant**.

Key Facts:

- **Strains:** Categorized under the “**FLiRT**” group, these strains are **highly transmissible**.
- **Symptoms:** Mild symptoms include **fever, cold, cough, sore throat, body ache, and fatigue**.
- **KP.2:** Classified by **WHO** as a **Variant Under Monitoring**.
- **Covid-19:** Caused by **SARS-CoV-2** virus; vaccines like **COVISHIELD, Covaxin, and AstraZeneca** were used in India.

Government Measures:

1. **Integrated Disease Surveillance Program (IDSP):**
 - Implemented across **36 States/UTs** under the **National Centre for Disease Control (NCDC)**.
 - Supports virus detection and research with **Viral Research and Diagnostic Laboratories**.
2. **Pradhan Mantri-Ayushman Bharat Health Infrastructure Mission (PM-A BHIM):**
 - Strengthens health infrastructure to monitor and manage emerging strains of Covid-19



Leonard Hayflick's Legacy: The Hayflick Limit and its Impact on Ageing

- The death of **Leonard Hayflick**, a renowned **biomedical researcher**, has drawn attention to his **groundbreaking discovery**, the **Hayflick Limit**, which revolutionized the understanding of **ageing**.

What is the Hayflick Limit?

- **Discovery:** In the **1960s**, Leonard Hayflick discovered that **somatic cells** (non-reproductive cells) can divide only **40-60 times** before they **cease dividing**, a phenomenon termed **cellular senescence**.
- **Ageing Mechanism:** This **cessation** of cell division leads to the accumulation of **senescent cells**, contributing to **ageing** as the body's ability to regenerate declines.
- **Cellular Clock:** The **Hayflick Limit** proposes that organisms, including humans, have a built-in **cellular clock** that determines the **maximum lifespan**. For humans, this is estimated to be around **125 years**.

Comparison Across Species:

- **Galapagos Turtles:** Cells divide about **110 times**, correlating with their **200-year lifespan**.
- **Laboratory Mice:** Cells divide only **15 times**, corresponding to their much **shorter lifespans**.

Further Studies:

- **Telomeres:** In the **1970s**, researchers discovered **telomeres**, protective DNA sequences at the ends of chromosomes that shorten with each cell division. Once telomeres reach a critical length, cell division stops, contributing to **ageing**.
- **Telomerase:** In the **1980s**, scientists found **telomerase**, a protein that can extend telomeres. Telomerase is active in **cancer cells**, allowing them to bypass the Hayflick limit and divide indefinitely, complicating its use in **healthy cells**.

What is Cell Division?

- **Cell Division:** A fundamental process in which a **parent cell** divides to produce **daughter cells**, crucial for **growth, repair, and reproduction**.
- **Types of Cell Division:**
 1. **Mitosis:** Produces two identical **somatic cells**, essential for growth and tissue repair.
 2. **Meiosis:** Produces **gametes** (sperm and egg cells), reducing chromosome numbers by half and introducing **genetic variation**.

Zoopharmacognosy: Self-Medication in Animals

Recent research highlighted a case of **Zoopharmacognosy** in a **Sumatran orangutan**, which treated a wound using the local plant **Fibraurea tinctoria**.

About Zoopharmacognosy:

1. **Definition:**
 - **Zoopharmacognosy** refers to the process by which **wild animals** use **medicinal plants** for the **treatment of diseases** and **protection from parasites**.
2. **Examples:**
 - **Dogs:** Chew grass and vomit it to expel infections in the stomach.
 - **Pregnant Lemurs:** Nibble on **tamarind leaves** to aid **milk production**.
 - **Pregnant Elephants:** Eat leaves from plants of the **Boraginaceae family** to induce **delivery**.

Nanoparticles Can Improve Fungal Infection Treatment

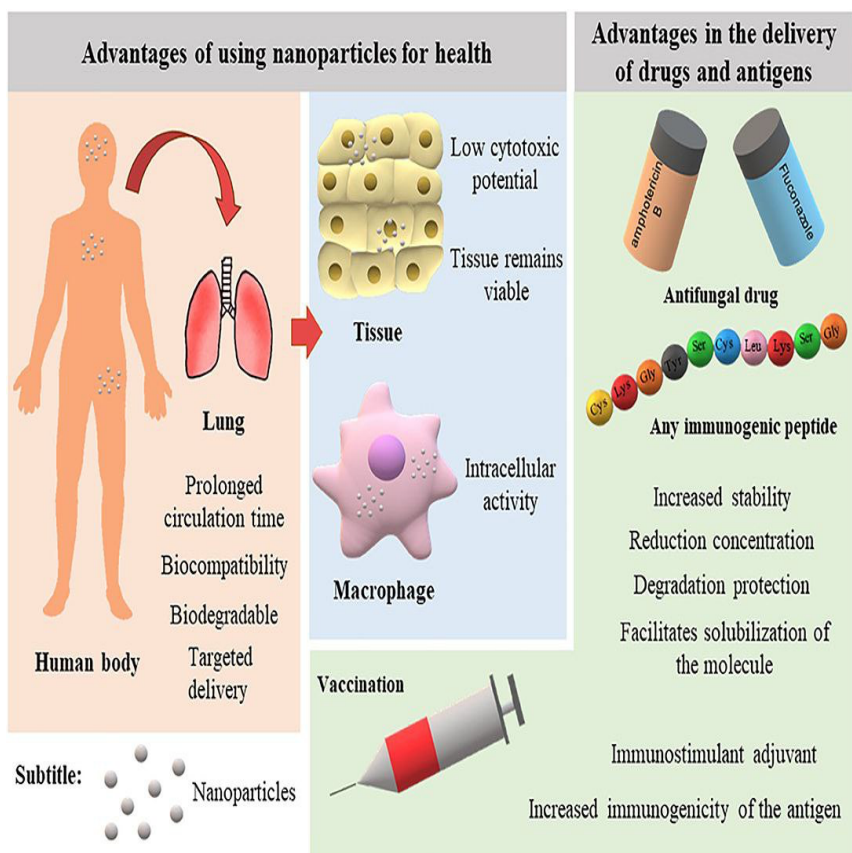
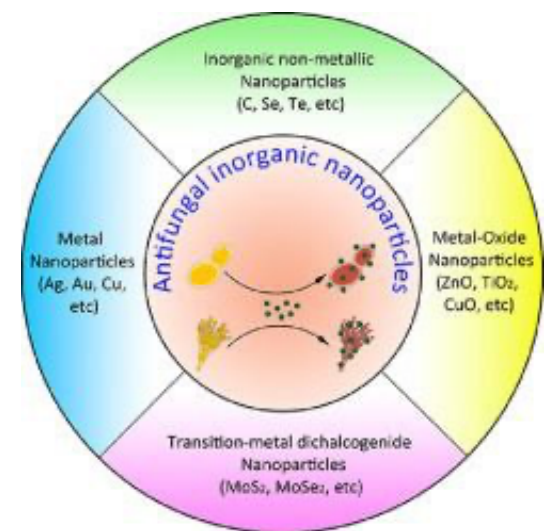
- Scientists have developed a **Polymeric Nanoparticles method** to enhance the delivery of drugs for treating fungal infections. This **advanced drug delivery** technique ensures the **effective release** of drugs while being free of **cytotoxic** and **hemolytic** effects, making it safer for patients.

Key Highlights:
1. Effective Drug Delivery:

- **Nanoformulation** used in this method was found to be non-toxic and effective, offering new treatment possibilities for patients suffering from **asthma, cystic fibrosis, HIV, cancer**, and other diseases.

2. Nanotechnology in Healthcare:

- **Nanotechnology** involves the manipulation of atoms and molecules at a **nanoscale** (100 nanometers or less), enabling **precise and targeted interventions** in various fields, especially healthcare.


Applications of Nanotechnology in Healthcare:
1. Better Imaging and Diagnostics:

- **Nanoparticles** can act as **contrast agents** in **MRI and CT scans**, leading to better visualization and improved diagnosis.

2. Targeted Drug Delivery:

- **Nanoparticles** allow for **targeted delivery** of drugs directly to affected areas, reducing **side effects** and enhancing the effectiveness of treatments.

3. Tissue Engineering and Regenerative Medicine:

- **Nanostructured materials**, such as **hydrogel scaffolds**, can mimic the **extracellular matrix**, promoting **cell growth** and **tissue regeneration**.

4. Gene Sequencing Technologies:

- **Nanopore materials** allow for **single-molecule detection**, making **gene sequencing** faster and more affordable.

Applications of Nanotechnology in Other Fields:
1. Energy:

- **Nanoparticles** improve the efficiency of **chemical processes** and are used in **offshore operations** like **gas lift valves**.

2. Environmental Remediation:

- **Nanomaterials** aid in **water purification**, **desalination**, and **oil spill cleanup** using nanofabric materials.

3. Electronics and IT Applications:

- **Nanoscale transistors** and **quantum dots** enable further **miniaturization** in **electronics**, leading to advanced **displays** and **lighting systems**.

4. Agriculture and Food System:

- **Nanoparticles** enhance **crop yields** by delivering targeted **nutrients** and **pesticides**. In **food packaging**, nanotechnology extends **shelf life** and improves **food safety**.

Vaccine-derived Polio Virus (VDPV)

- A case of **Vaccine-derived Polio Virus (VDPV)** infection was reported from **Meghalaya**.
- India was declared **polio-free** by the **WHO** in **2014**, with the last case of wild poliovirus reported in **2011**.

About VDPV:

- **VDPV** is a strain of poliovirus that has mutated from the original strain contained in the **Oral Polio Vaccine (OPV)**.
- **OPV** contains an **attenuated (weakened)** form of the poliovirus, which activates an **immune response** in the body.
- On rare occasions, when replicating in the gastrointestinal tract, **OPV strains** can genetically change and may **spread in communities** that are not fully vaccinated, especially in areas with **poor hygiene, sanitation, or overcrowding**.

ISDra2TnpB: Revolutionizing Plant Genome Editing Beyond CRISPR

The **Indian Council of Agricultural Research (ICAR)** has developed a miniature genome editing tool called '**ISDra2TnpB**', which is regarded as a next-generation tool in **plant genome editing**. This tool presents a significant advancement over the commonly used **Cas9 and Cas12 proteins** associated with the **CRISPR** technology, addressing their limitations, particularly related to their size and delivery efficiency.

CRISPR and Its Limitations:

CRISPR is a groundbreaking technology for **precise genome editing**, but it has certain limitations:

1. **Protein Size:** The commonly used proteins, **Cas9 and Cas12**, are large, comprising **1,000–1,350 amino acids**. Their large size presents **challenges for delivery into plant cells**, especially through viral vectors, making genome editing less efficient.
2. **Delivery Efficiency:** The size of Cas9 and Cas12 makes it difficult to package and deliver these proteins into cells effectively, limiting their utility in complex biological systems.

About ISDra2TnpB:

- **Origin:** The ISDra2TnpB genome editing tool is derived from **Deinococcus radiodurans**, a bacterium known for its ability to survive in **extreme environmental conditions**.
- **Transposons (Jumping Genes):** TnpB proteins belong to a family of **transposons or jumping genes**. These genes can **move within the genome**, targeting specific DNA sequences with the help of RNA.
- **Size:** Unlike Cas9 and Cas12, TnpB proteins consist of only **350–500 amino acids**, which makes them more manageable for **effective delivery** within plant cells.

Significance of ISDra2TnpB:

1. **Enhanced Targeting:**
 - **TnpB** can target **unique regions in the genome** that **Cas9** cannot, providing greater flexibility and specificity in genome editing.
2. **Fusion Protein Creation:**
 - The tool facilitates the creation of **fusion proteins** (chimeric proteins) by joining two or more genes that originally coded for separate proteins. This broadens the scope of **genome engineering applications**, such as **synthetic biology** and **biotechnological advancements**.
3. **Versatility:**
 - ISDra2TnpB has been demonstrated to be effective on both **monocots** (e.g., rice) and **dicots** (e.g., Arabidopsis), which are the two main groups of flowering plants, indicating its wide applicability in **agricultural biotechnology**.

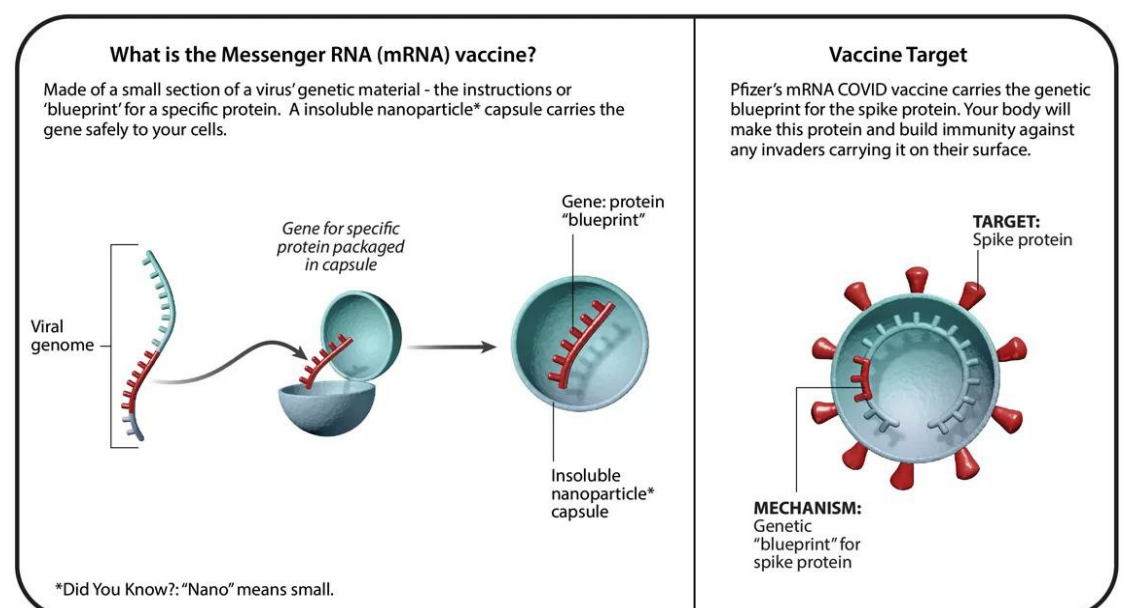
World's First mRNA Lung Cancer Vaccine Trials Begin in Europe

Context: Trials for the world's first **mRNA lung cancer vaccine**, named **BNT116**, have begun in Europe. The vaccine is designed to treat **non-small cell lung cancer (NSCLC)**, the most common type of lung cancer.

- **Lung Cancer:** Lung cancer is the leading cause of cancer deaths globally, accounting for **1.8 million deaths annually**.

About mRNA Vaccine Technology:

1. **Working Mechanism:**



- **mRNA (messenger Ribonucleic Acid)** technology works by introducing a piece of mRNA that instructs cells to create a **viral protein** (or a cancer-associated protein), which triggers the **immune system** to produce **antibodies** and strengthen immune defenses.
- The **mRNA** serves as a **genetic recipe**, directing cells to produce proteins that mimic the target (like viral proteins), activating the immune system.
- **Example:** The **COVID-19 mRNA vaccines** directed cells to produce copies of the **spike protein** found on the coronavirus, training the immune system to fight the virus.

2. Benefits:

- **Safer:** mRNA vaccines do not contain live or weakened viruses, reducing risks.
- **Speed:** These vaccines can be developed quickly compared to traditional vaccines, which require growing the virus over months.

Significance:

The use of **mRNA technology** in cancer treatment, such as in the **BNT116 vaccine**, is seen as a breakthrough in **personalized medicine**, potentially leading to more effective and faster responses in combating diseases like **non-small cell lung cancer**.

Subclinical Tuberculosis (TB) in India: Rising Concern

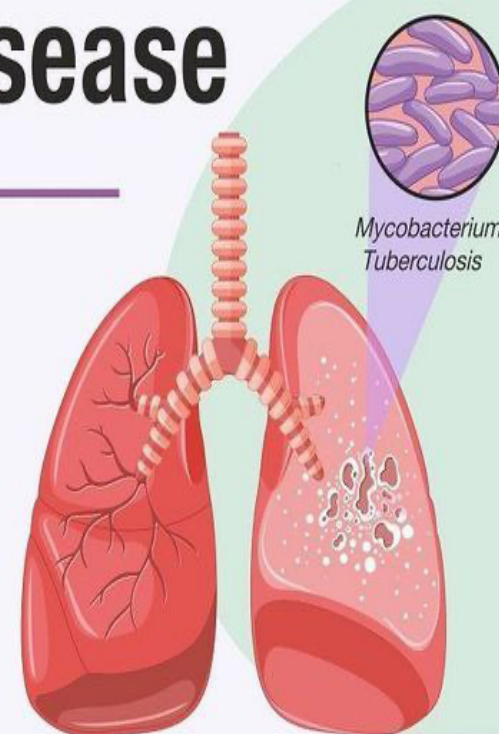
- **Subclinical Tuberculosis (TB)** is contributing to the slow decline in TB incidence rates in India, despite advancements in detection and treatment.

What is Subclinical Tuberculosis?

- **Definition:** A form of TB where individuals do not show typical symptoms like a persistent cough, making it harder to detect.
- **Detection:** Identified through imaging (e.g., chest X-rays) or molecular tests, not routine symptom-based screenings.
- **Prevalence:** Found in **42.6%** of cases in India's **National TB Prevalence Survey (2019-2021)**; in Tamil Nadu, it accounted for **39%**.
- **Transmission:** Asymptomatic individuals can still spread the bacteria, fueling continued disease transmission.
- **International Example:** **Vietnam** reduced TB prevalence through population-wide screening using X-rays and molecular tests.
- **Impact:** Delays TB detection and treatment, sustaining transmission and slowing the overall decline in incidence rates.

Tuberculosis (TB) Disease

The bacteria that cause tuberculosis is *Mycobacterium tuberculosis*. Tuberculosis is communicable through the air when an infected person coughs or sneezes

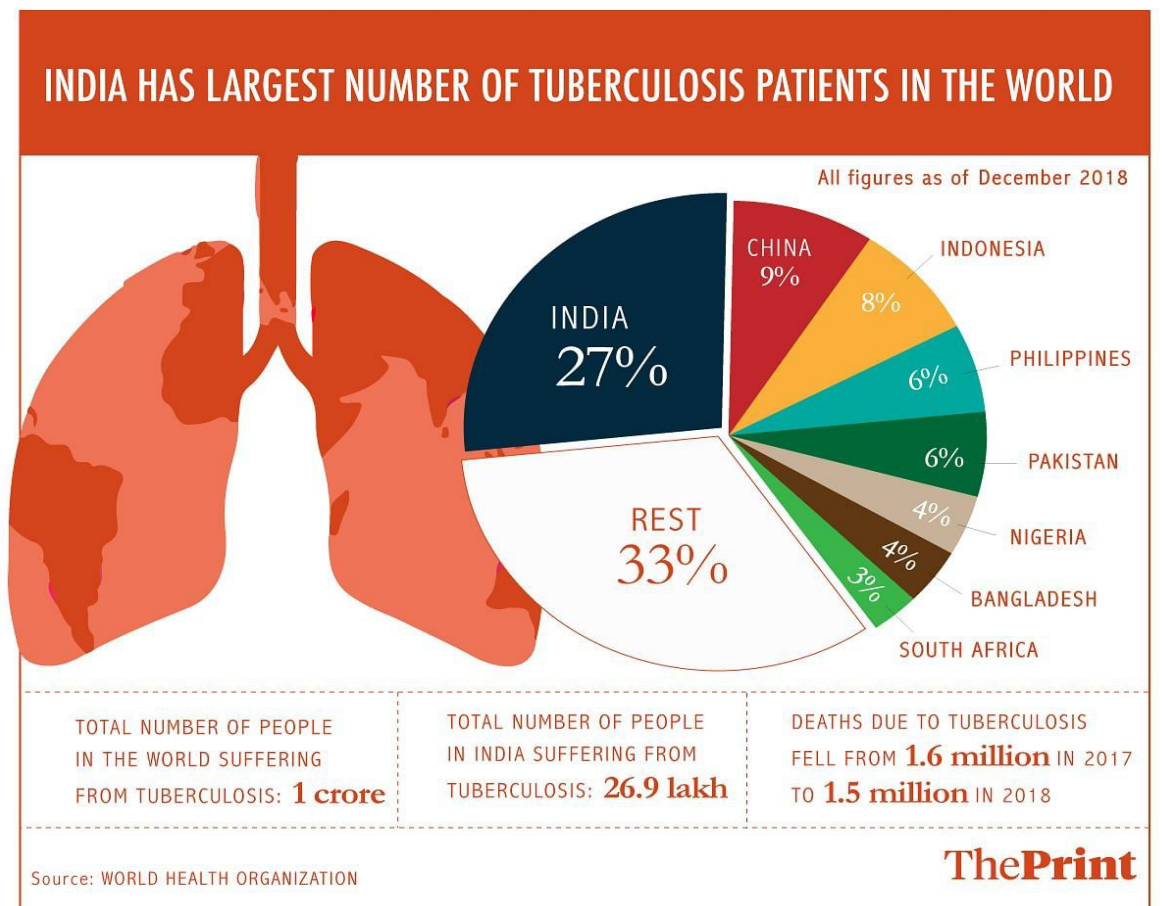


Key Facts About Tuberculosis (TB):

- **Cause:** TB is caused by **Mycobacterium tuberculosis**, primarily affecting the lungs.
- **Symptoms:** Include **prolonged cough, chest pain, weight loss, fever, and night sweats**.
- **Risk Factors:** Conditions like **diabetes, malnutrition, and HIV** increase susceptibility.
- **Prevention and Treatment:** The **BCG vaccine** prevents TB outside the lungs; TB is treatable with **antibiotics** like isoniazid and rifampin.
- **Drug Resistance:** **Multidrug-resistant TB (MDR-TB)** requires costly, toxic second-line drugs and remains a public health crisis.
- **TB and HIV:** TB is the leading cause of death among people with **HIV**, who are **16 times** more likely to develop TB.

Global and Indian Initiatives:

- **India:**
 - **National TB Elimination Programme (NTEP):** Aims to eliminate TB by **2025**.
 - **Ni-kshay Mitra Initiative** and **DBT** schemes support TB patients.
 - **TB-Mukt Panchayat Initiative:** Engages **Gram Panchayats** to raise awareness and eliminate stigma.
 - **Pradhan Mantri TB Mukta Bharat Abhiyan (PMTBMBA):** Focuses on TB-free India.
- **Global:**
 - **WHO Global Tuberculosis Programme:** Aims for a TB-free world.
 - **Global Plan to End TB 2023-2030:** Aligned with the **UN Sustainable Development Goals (SDG 3)**.



IQRA

Wisdom leads to success

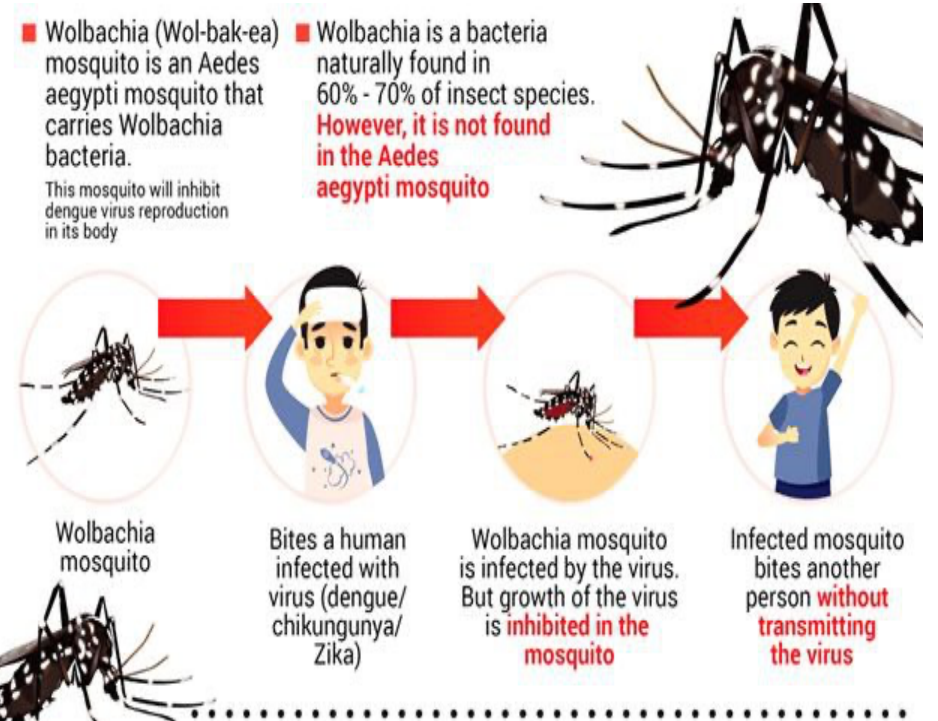
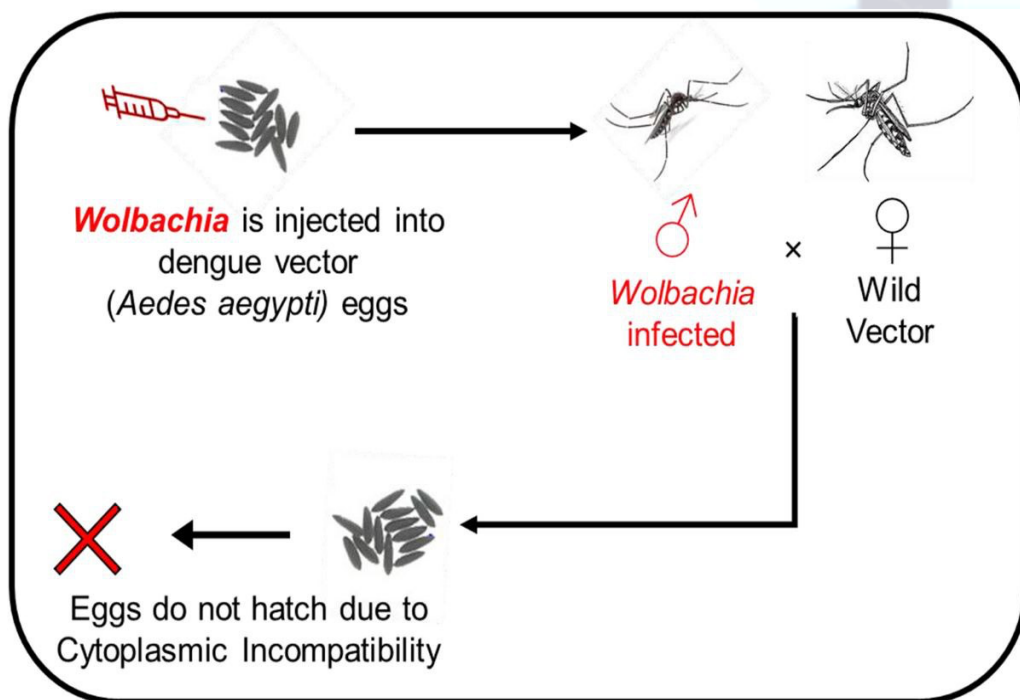
SCIENCE & TECHNOLOGY

Wolbachia-Infected Mosquitoes: A New Hope for Controlling Dengue and Other Mosquito-Borne Diseases

- **Dengue fever, chikungunya, and Zika virus** continue to pose significant public health challenges in India, causing **economic losses** and **healthcare burdens**.
- **Innovative strategies** like **Wolbachia-infected mosquitoes** offer a promising solution, as traditional control methods have had limited success.

Key Statistics (April 2024):

- **India:** Recorded **19,447 dengue cases** and **16 deaths**, with Kerala and Tamil Nadu reporting the highest numbers.
- **Economic Impact:** **Rs 28,300 crore** annual loss and **5.68 lakh** years of young life lost.
- **Global:** **7.6 million dengue cases** reported by the **World Health Organization (WHO)**.



How Does Wolbachia Help in Controlling Mosquito Populations?

- **About Wolbachia:**
 - **Wolbachia** is a **common bacteria** found in 60% of insects but not in *Aedes Aegypti*, the mosquito responsible for spreading **dengue, Zika, and chikungunya**.
 - **Wolbachia-infected mosquitoes** are not genetically modified and do not pose health risks to humans or animals.
- **Process of Production:**

- **Wolbachia bacteria** are introduced into *Aedes Aegypti* eggs, leading to the production of **infected mosquitoes**.
- Only **male mosquitoes** (which do not bite) are released into the wild.
- When **Wolbachia-infected males** mate with **wild females**, their eggs **do not hatch**, effectively reducing the mosquito population.
- **Global Success:**
 - **Singapore:** Achieved a **90% reduction** in the *Aedes* population and a **77% decrease in dengue cases**.
 - **Australia:** Saw stable **wMel strain** integration and significant declines in dengue.
 - **Indonesia:** A trial showed **77% fewer dengue cases** and an **86% decrease in hospitalizations**.

Status of Wolbachia Programs in India:

- **ICMR-VCRC:** India is working on developing **wMel Aedes strains**, though **progress** has been slow due to **approval delays**.
- **Natural Presence:** Recent studies found **Wolbachia in Aedes mosquitoes** in **Northeast India**, but its significance is still being explored.

ISRO Successfully Launches SSLV-D3 with EOS-08 Satellite

Why in News?

- The **Indian Space Research Organisation (ISRO)** successfully conducted the third developmental flight of the **Small Satellite Launch Vehicle (SSLV)**, placing the **Earth Observation Satellite EOS-08** into orbit, marking the completion of ISRO's **SSLV Development Project**.

Key Facts About SSLV

1. About SSLV:

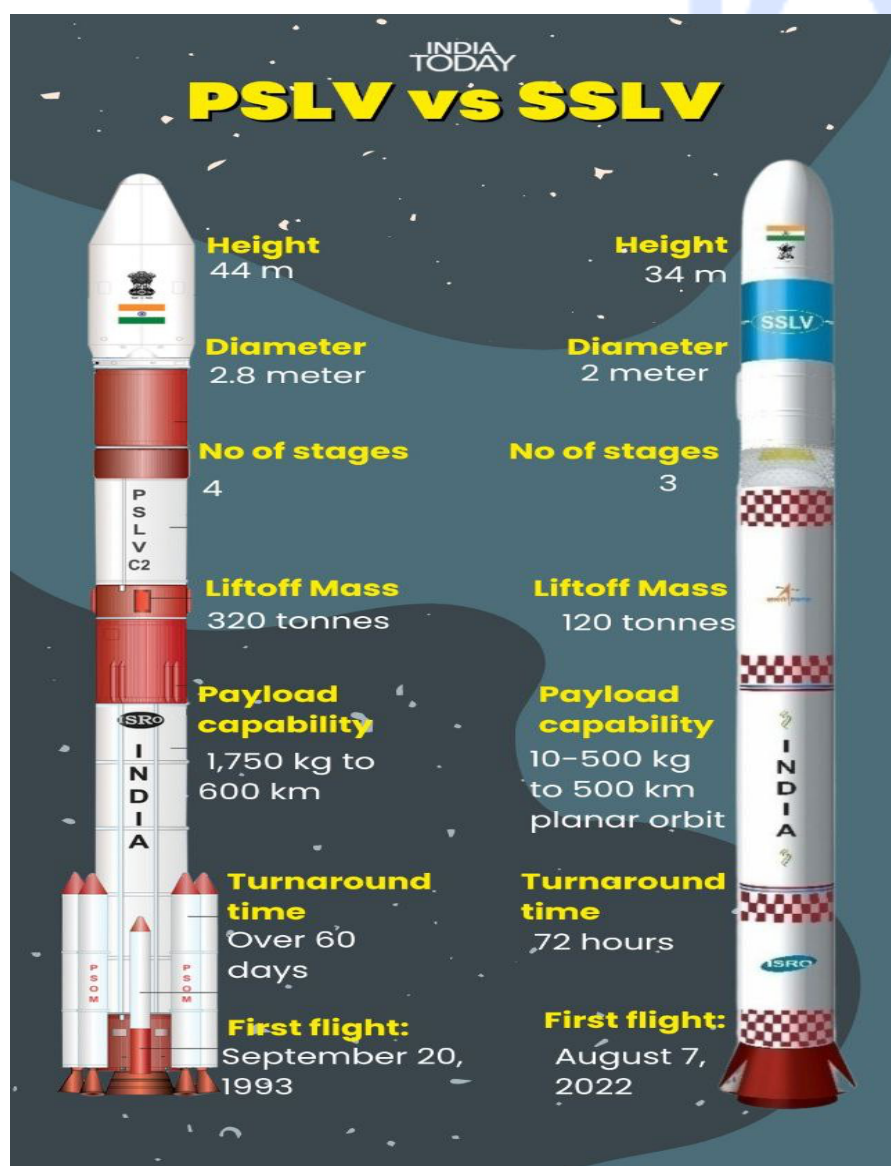
- The **SSLV** is a **three-stage launch vehicle** developed by ISRO.
- It uses **three solid propulsion stages** and a **Velocity Trimming Module (VTM)**, which uses liquid propulsion to adjust the satellite's velocity for precise orbital insertion.

2. Need for SSLV:

- SSLVs are designed for **low-cost launches** with **quick turnaround times** and **minimal infrastructure**.
- The vehicle is capable of launching **Mini, Micro, or Nanosatellites** (10 to 500 kg) into a **500 km orbit**, catering to the growing demand for smaller payload launches by businesses, universities, and research organizations.

3. Benefits of SSLV:

- Quick Integration:** SSLVs take only **72 hours** to integrate, compared to **70 days** for **Polar Satellite Launch Vehicles (PSLVs)** and **Geosynchronous Satellite Launch Vehicles (GSLVs)**.
- On-demand Launches:** The SSLV is an **on-demand vehicle**, requiring just six people to operate, at a cost of **Rs 30 crore**.



What are PSLVs and GSLVs?

1. PSLV (Polar Satellite Launch Vehicle):

- Third-generation satellite launch vehicle with **over 50 successful launches** since 1994.
- Known as the **"workhorse of ISRO"**, it is used to deliver satellites into **low earth orbits (LEO)**, particularly **Sun-Synchronous Polar Orbits (SSPO)**.
- Notable missions include **Chandrayaan-1 (2008)** and **Mars Orbiter Mission (2013)**.
- Payload Capacity:** Can launch up to **1,750 kg** to a 600 km SSPO.

2. GSLV (Geosynchronous Satellite Launch Vehicle):

- Designed to place satellites into **Geosynchronous Transfer Orbits (GTO)**, leading to **geosynchronous orbits** around Earth.
- A **three-stage vehicle**, comprising a **solid booster**, **liquid engine**, and an indigenously built **Cryogenic Upper Stage (CUS)** for carrying cryogenic propellants.
- Primarily used for launching communication satellites into higher orbits.

NewSpace India Limited (NSIL)

1. About NSIL:

- NSIL is a **government-owned company** under the **Department of Space**.
- It is responsible for facilitating the **production of PSLV and SSLV** by industry and marketing **space-based services**, including launch services, remote sensing, and mission support.

2. Key Business Areas:

- **Production and marketing** of space services, including **transponder leasing** and **remote sensing**.
- **Satellite construction** for communication and earth observation based on user specifications.
- **Technology transfer** from ISRO to Indian industries.

Advancing Medicine with 4D-Printed Blood Vessels

Indian researchers have made a breakthrough by developing **4D-printed artificial blood vessels**, marking a significant advancement in **medical grafts** and treatments for **organ regeneration**. This technology has the potential to revolutionize fields such as **medicine, soft robotics, and aerospace** through its adaptability and efficiency.

What is 4D Printing?

4D Printing builds on **3D printing** (Additive Manufacturing) by incorporating the **dimension of time**. In traditional **3D printing**, objects are created layer by layer from a digital model. However, **4D printing** allows these objects to **change shape or function over time** in response to external environmental stimuli such as **heat, light, moisture**, etc.

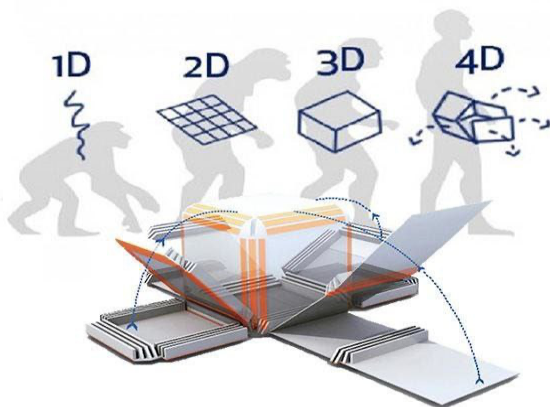
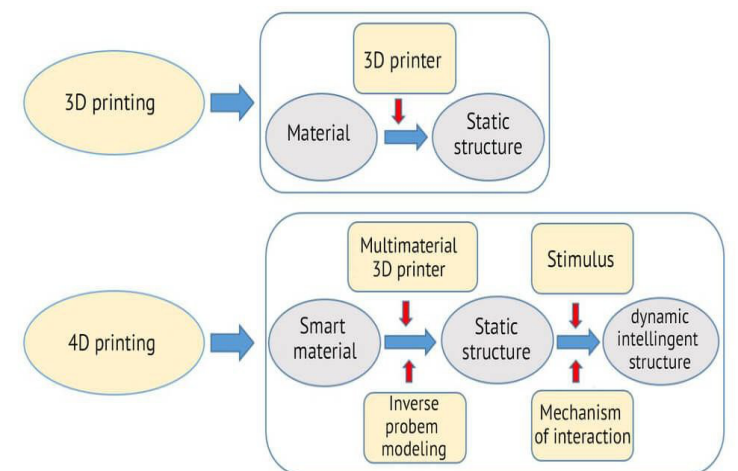


Diagram Explanation:

- **2D Printing:** Produces a flat image, like a printed star on paper.
- **3D Printing:** Produces a solid, raised star model.
- **4D Printing:** The star model transforms shape in response to external stimuli.



Applications of 4D Printing:

- 1. Medical Applications: Drug Delivery:** Controlled release of medication in response to specific body conditions.
 - **Tissue Fabrication & Organ Regeneration:** **4D-printed blood vessels** can be used in surgeries and implants for better adaptability and performance.
- 2. Soft Robotics:** Utilizes 4D printing to create **flexible and deformable** robots that can adapt to various environmental changes.
- 3. Aerospace:** Enables the production of **low-cost, durable parts** that can adapt to **extreme conditions**, such as **Nitinol alloy manufacturing**.
- 4. Other Applications: Sensors & Flexible Electronics:** Reactive components that adjust based on external stimuli.
 - **Active Origami Art:** Self-folding structures.
 - **Self-Evolving Structures:** Structures that adjust and grow in response to changing conditions.

Advantages of 4D Printing:

- 1. Dynamic Functionality:** Creates structures that can **adapt and evolve** based on changing environments, offering superior functionality compared to traditional 3D printing.
- 2. Material Efficiency:** Reduces waste by using materials more effectively during the production process.
- 3. Complex Design Fabrication:** **Stereo lithography 4D techniques** enable the creation of highly complex and detailed designs that would be difficult or impossible with other manufacturing methods.

Challenges in 4D Printing:

- 1. Limited Availability of Technologies:**
 - Currently, 4D printing technologies are restricted to a few research institutes, limiting widespread use.
- 2. Material Limitations:**
 - Issues such as material **degradation** when subjected to **continuous deformation** hinder the durability and effectiveness of 4D-printed structures.

Scientists Discover Liquid Water on Mars

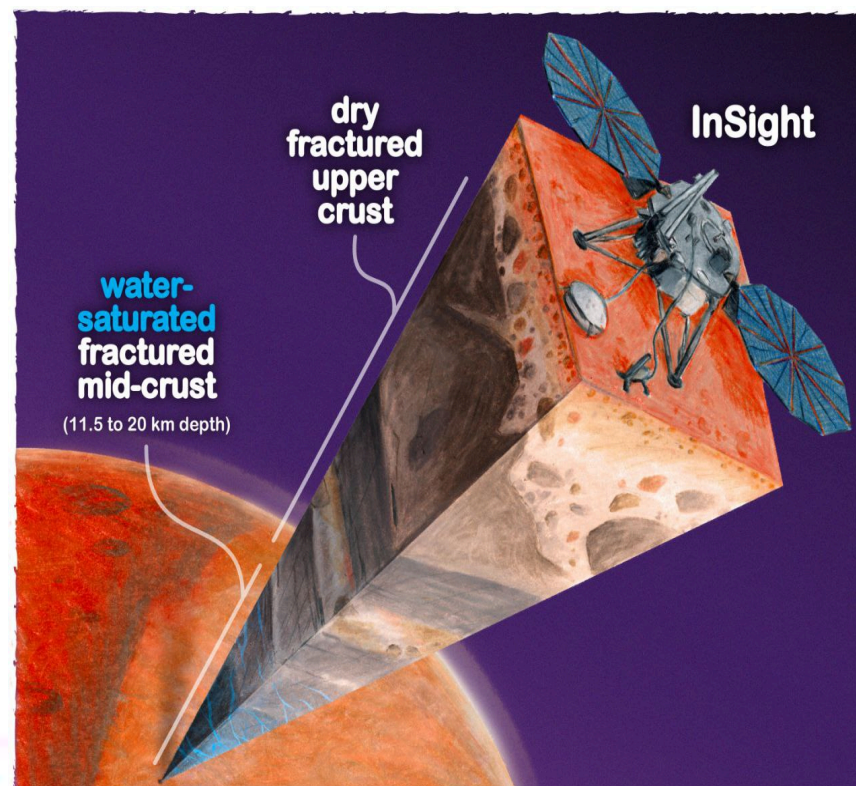
- A recent study titled "**Liquid water in the Martian mid-crust**" has suggested that **Mars** may harbor **oceans' worth of liquid water** deep within its **rocky outer crust**.

Key Findings:

1. **Location:**
 - The liquid water is believed to be located at depths of **10 to 20 km** in the **Martian crust**.
2. **Data Source:**
 - The discovery was made using data from **NASA's Mars InSight Lander**.

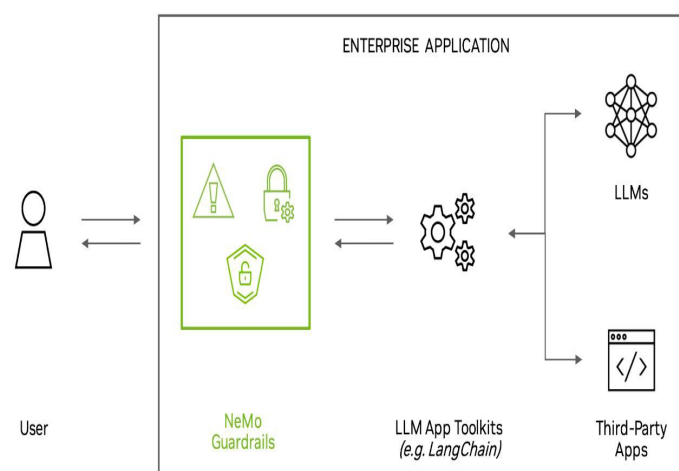
Significance:

- This marks the **first time** that scientists have discovered **liquid water** on **Mars**.
- It could help scientists better understand the **water cycle** on Mars, potentially unlocking answers about the planet's **climate evolution, surface dynamics, and interior structure**.



AI Guardrails and Responsible AI

- Media reports have raised concerns regarding the **lack of AI guardrails** in the newly launched AI models **Grok-2** and **Grok-2 mini** by Elon Musk's **xAI**.



About AI Guardrails:

1. Definition:

- **AI Guardrails** are **frameworks** and **mechanisms** designed to ensure that **AI systems** operate within **ethical, legal, and technical** boundaries.

2. Purpose:

- They aim to **prevent AI from causing harm**, making **biased decisions**, or being **misused**.
- Guardrails are **critical** for ensuring **responsible AI development and governance**.

3. Importance:

- They ensure the **safe deployment and use of AI** by mitigating risks such as **discrimination, privacy violations, and unintended consequences**.

Quantum Nonlocality

- Recent research has expanded the potential applications of **quantum nonlocal correlations**, which are already used in **secure communication** and **cryptographic key creation**.

About Quantum Nonlocality:

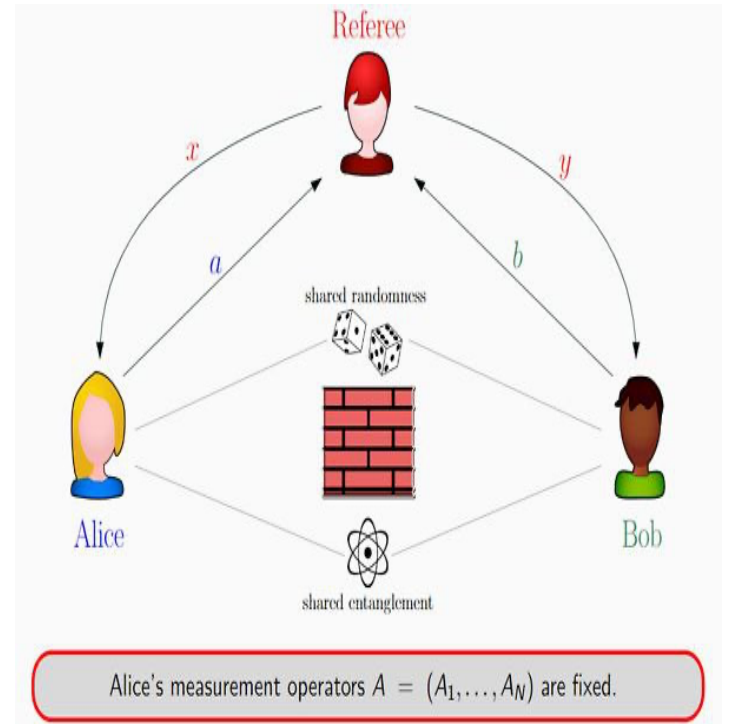
- **Quantum nonlocality** refers to the ability of quantum particles to exhibit correlations or influence each other's states, **instantaneously**, even when they are separated by large distances.
- This phenomenon **challenges the classical "principle of locality"**, which holds that distant objects cannot directly influence each other.

- **Key Mechanism: Entanglement:**

- Nonlocality arises due to **quantum entanglement**, where particles that have interacted become **permanently correlated**.
- When two particles are entangled, the state of one particle is dependent on the state of the other, regardless of the **distance** between them.

Significance:

- **Applications in Secure Communication:** Quantum nonlocality is utilized to create highly **secure communication channels** where information cannot be intercepted without detection.
- **Cryptographic Key Creation:** The correlations provided by quantum nonlocality allow for the generation of **cryptographic keys** that are practically impossible to hack using classical methods, enhancing **data security**.



Super Blue Moons

- A **Super Blue Moon**, a rare astronomical event that occurs on average every **10 years**, was recently observed.

About Super Blue Moons:

- A **Super Blue Moon** is the **convergence of two phenomena**:
 - **Supermoon:** Occurs when the Moon is at or near its closest point to Earth (**perigee**) while being **full**.
 - **Blue Moon:** Refers to the second full moon in a single calendar month or the **third full moon** in a season that has **four full moons** instead of the usual three.

Types of Blue Moons:

1. **Monthly Blue Moon:** Occurs when two full moons happen within a single month.
2. **Seasonal Blue Moon:** Occurs when there are four full moons in a single season, with the third one being the Blue Moon.

Tera Hertz (THz) Waves

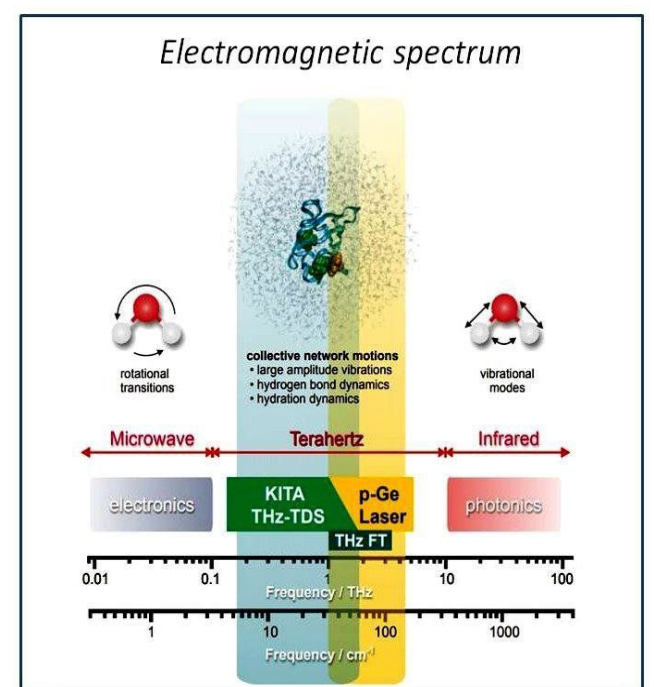
Context: The **Telecom Regulatory Authority of India (TRAI)** has recommended the establishment of **Tera Hertz Experimental Authorization** to foster the development of innovative technologies and services in the **THz frequency band**.

About Tera Hertz (THz) Waves:

- **Frequency Range:** THz radiation typically refers to **electromagnetic waves** with frequencies ranging from **0.1 to 10 THz**, placing it between the **microwave** and **infrared** regions of the electromagnetic spectrum.
- **Characteristics:** THz waves can penetrate various materials, making them useful for non-invasive imaging and communications, but they are also highly sensitive to atmospheric absorption, which limits their long-range application.

Applications of THz Waves:

1. **Space-Based Communication:**
 - THz waves are used in applications such as **Earth Exploration-Satellite Service (EESS)** and **radio astronomy** to observe cosmic phenomena and gather data from space environments.
2. **Short-Range Wireless Communication:**



- THz frequencies can be used for **high-speed wireless communication** over short distances, which has potential applications in **data centers** and **next-generation wireless networks**.
- 3. **Security Applications:**
 - THz waves are capable of detecting **solid explosive materials** and other dangerous substances, providing advanced security scanning capabilities.
- 4. **Biomedical Imaging:**
 - In the field of **biomedical imaging**, THz waves can be used for **body surface diagnoses** and other medical applications, offering non-invasive ways to scan and diagnose conditions without harmful radiation.

JUICE Mission (Jupiter Icy Moons Explorer)

Context: The European Space Agency (ESA) is set to execute a **ground-breaking double slingshot manoeuvre** as part of the **JUICE (Jupiter Icy Moons Explorer)** mission, which is aimed at exploring Jupiter and its major moons.

Key Features of the JUICE Mission:

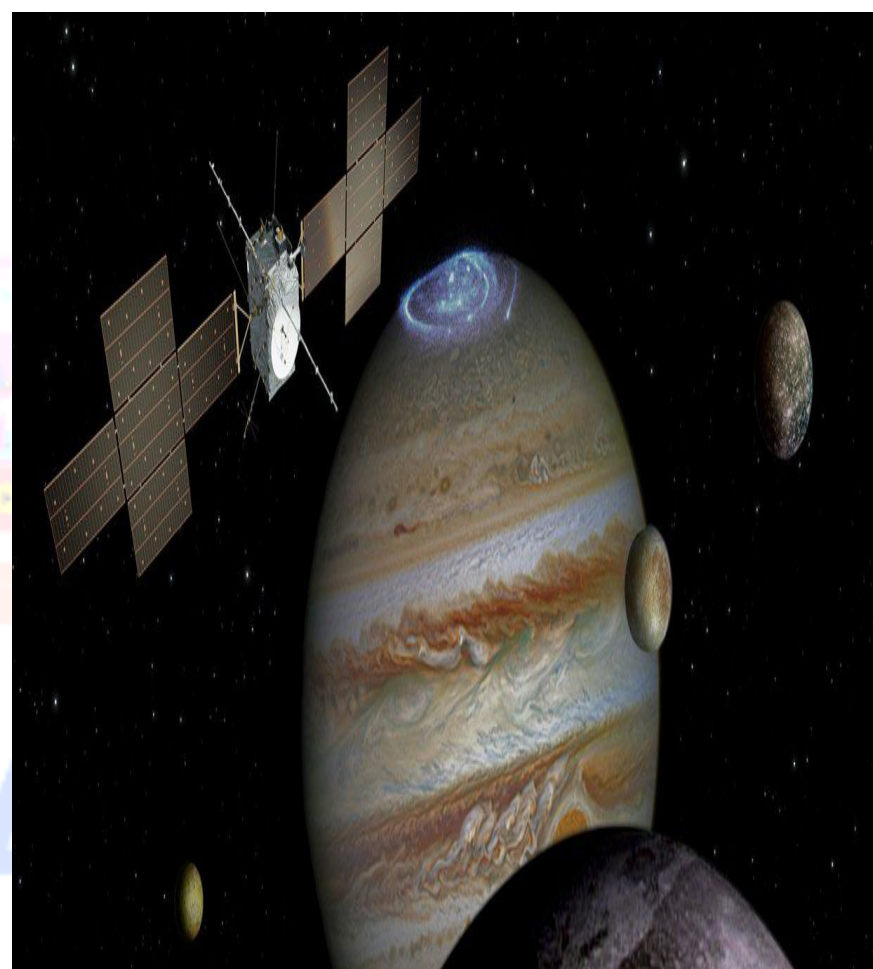
1. **Slingshot Manoeuvre:**
 - **Double Slingshot:** The probe will first use the **Moon's gravity** to redirect its trajectory toward Earth, followed by using **Earth's gravity** to slow down, a manoeuvre that will set it on course for Jupiter.
 - **First in Space Exploration:** This complex manoeuvre has never been attempted before and poses significant risks due to the potential for errors that could affect the mission's trajectory and objectives.
2. **Destination:**
 - **Jupiter and Its Moons:** If successful, JUICE will arrive at **Jupiter** by **2031**, with plans to study three of its moons—**Callisto, Europa, and Ganymede**—through additional **gravity assists from Venus and Earth**.

Mission Objectives:

1. **Map the Moons' Surfaces:**
 - JUICE will create **detailed maps** of Jupiter's moons, especially **Ganymede, Callisto, and Europa**, focusing on their **subsurface water bodies** to investigate potential habitability.
2. **Study Jupiter:**
 - The mission aims to develop a comprehensive understanding of **Jupiter's origin, history, and evolution**, expanding our knowledge of the gas giant and its surrounding environment.
3. **Focus on Ganymede:**
 - **Ganymede**, the **largest moon** in the Solar System, is of particular interest due to its **unique magnetic field**. JUICE will study this moon extensively to explore its composition, magnetic field, and potential for habitability.
4. **Assess Habitability:**
 - Although JUICE will not directly search for life, it will assess whether **conditions for life**—such as **water, essential biological elements, energy sources, and environmental stability**—exist in and around **Jupiter and its moons**.

Significance of the Mission:

- **Technological Innovation:** The **double slingshot manoeuvre** highlights significant advancements in space navigation and trajectory management, setting a new benchmark for future space missions.



- **Potential for Life:** The exploration of **subsurface oceans** and assessment of habitability around Jupiter's moons could provide crucial insights into the possibility of life beyond Earth, particularly in icy moons like **Europa** and **Ganymede**.
- **Deepening Understanding of Jupiter:** The mission will help scientists build a clearer picture of **Jupiter's role** in the evolution of the **Solar System** and its influence on its moons.

Elemental Abundance Measurements of Lunar Soil

Context: The **Alpha Particle X-ray Spectrometer (APXS)** aboard the **Pragyan Rover** of **Chandrayaan-3** has provided the **first in-situ elemental abundance measurements** of lunar soil in the **South Polar Region** of the Moon.

Key Findings:

1. **Support for Lunar Magma Ocean (LMO) Hypothesis:**
 - The **APXS data** aligns with the **LMO hypothesis**, which proposes that the Moon's **primordial crust** formed as **lighter minerals** floated to the surface after a molten state.
2. **Magnesium-Rich Minerals:**
 - Higher levels of **magnesium-rich minerals** were detected, indicating contributions from **deeper lunar layers**. This is likely due to the **ejection of material** during the formation of the **South Pole-Aitken (SPA) basin**.
3. **Lunar Soil Composition:**
 - The lunar soil appears to be a mixture of two rock types:
 - **Ferroan Anorthosite** (rich in **plagioclase**).
 - **Magnesian Suite**, containing unexpected levels of **olivine** and **pyroxene**, minerals typically found in the Moon's **inner layers**.

Significance: These measurements are crucial in understanding the **Moon's geological history**, especially in the **South Polar Region**, offering insights into its **composition** and supporting theories about the **Moon's formation and evolution**.

India's First Reusable Hybrid Rocket - RHUMI-1 Launched

Context: **RHUMI-1**, India's first **Reusable Hybrid Rocket**, was launched from **Thiruvudandai** in **Chennai** by Tamil Nadu-based startup **Space Zone India**, in collaboration with **Martin Group**.

Key Details:

- **Payload:** The rocket carried **3 Cube Satellites** and **50 PICO Satellites** to collect data on **global warming** and **climate change**.
 - **Cube Satellites:** Weigh between **1-10 kg** (nanosatellites).
 - **PICO Satellites:** Weigh between **0.1-1 kg** (small satellites).

Features of RHUMI-1:

1. **Hybrid Rocket Engine:**
 - Uses a combination of **solid and liquid propellants** to enhance **efficiency** and **reduce operational costs**.
2. **Adjustable Launch Angle:**
 - Launch angle can be precisely adjusted from **0 to 120 degrees** for better trajectory control.
3. **Electrically Triggered Parachute System:**
 - A cost-effective, **eco-friendly descent mechanism** that ensures safe recovery of rocket components.
4. **Environmentally Friendly:**
 - **100% pyrotechnic-free** and **0% TNT**, making it safer for the environment.

Reusable Rockets:

- **Function:** After releasing the payload, the rocket returns to Earth and can be **reused** with a new payload.

Benefits of Reusable Rockets:

1. **Cost Savings:**
 - Up to **65% cheaper** than building a new rocket for every launch.
2. **Reduced Space Debris:**
 - Minimizes the amount of discarded rocket components in space.
3. **Increased Launch Frequency:**
 - **Faster turnaround time** enables more frequent use of the rocket for launches.

Significance: The launch of **RHUMI-1** marks a significant step in **India's space technology**, contributing to cost-effective and **environmentally friendly** space missions, while also enhancing **satellite data collection** for climate research.

Tanager-1 Satellite

Context: The Tanager-1 satellite was recently launched as part of efforts to monitor and address greenhouse gas emissions.

About Tanager-1:

- **Developer:** Tanager-1 is the **first satellite** of the **Carbon Mapper Coalition**, developed by **Planet Labs PBC**.
- **Purpose:** The satellite is designed to **detect and map high-priority areas** of **methane and carbon dioxide emissions** with **high resolution**.
- **Organization:** **Carbon Mapper** is a **nonprofit organization** focused on promoting timely actions to mitigate **greenhouse gas emissions**.
- **Importance of Methane:**
 - **Methane** is over **80 times more powerful** at retaining heat in the atmosphere than **carbon dioxide (CO₂)**.
 - Methane contributes to about **30% of the global temperature rise** observed to date.
- **Instruments:**
 - Tanager-1 utilizes **imaging spectrometer technology** developed by **NASA's Jet Propulsion Laboratory**, enabling precise monitoring of greenhouse gases.

Significance: The Tanager-1 satellite plays a crucial role in enhancing **environmental monitoring** and **climate action** by providing detailed data on **methane** and **CO₂** emissions, which are key drivers of **global warming**.

Directorate General of Quality Assurance (DGQA)

- The **Defence Research and Development Organisation (DRDO)** recently handed over the **Authority Holding Sealed Particulars (AHSP)** of the 'Nipun' munition to the **DGQA**.

About NIPUN Munition:

- **NIPUN** is a **Soft Target Munition**, designed and developed by the **Armament Research & Development Establishment (ARDE)** under **DRDO**. It is intended for use against soft targets in a battlefield.

About DGQA:

1. **Role and Function:**
 - The **Directorate General of Quality Assurance (DGQA)** is an **Inter-Service Organisation** operating under the **Department of Defence Production**, within the **Ministry of Defence**.
 - It is responsible for **second-party quality assurance** of all defence stores and equipment, including both **imported** and **indigenous** goods.
2. **Scope:**
 - **DGQA** conducts **quality checks** for the **Army, Navy** (excluding **Naval Armaments**), and common user items for the **Air Force**.
 - It oversees the quality of equipment procured from the **private sector, public sector undertakings, and ordnance factories**.

REPORTS & RANKINGS

Impact of E-Commerce on India's Economy: Key Issues and Benefits

On August 22, 2024, India's **Commerce and Industry Minister** expressed concerns about the long-term adverse impacts of **e-commerce** on the economy while launching the report titled "*Net Impact of E-Commerce on Employment and Consumer Welfare in India.*" The report highlights both the positive and negative effects of e-commerce in India.

Key Issues Raised:

Adverse Impacts of E-Commerce:

1. Predatory Pricing:

- E-commerce platforms often engage in **deep discounting** strategies to push out competitors, leading to **market monopolization**. Once competition is minimized, the cost-effectiveness for consumers may decline.

2. Reduced Consumer Choices:

- As local shops close due to competition from e-commerce, consumers may face **higher travel costs** and **fewer shopping options**. This trend may also reduce consumer access to local products.

3. Employment Loss:

- **Traditional retail sectors** are often threatened by e-commerce growth, leading to job losses due to diminished competition and downsizing in brick-and-mortar businesses.

4. Privacy Concerns:

- **Data abuse** and privacy violations are growing issues as e-commerce platforms collect and sometimes misuse consumer data.

5. Breach of Law:

- Regulatory challenges persist. Some platforms (e.g., **Amazon**) are accused of engaging in **B2C transactions**, despite restrictions on direct sales to consumers in India.

Regulatory Framework:

To mitigate these challenges, India has introduced various regulations:

- **Consumer Protection (E-Commerce) Rules, 2020:** Designed to regulate e-commerce platforms and protect consumers from fraudulent practices.
- **Consumer Protection Act, 2019:** Provides additional safeguards against unfair trade practices and misleading advertisements.

Positive Impacts of E-Commerce:

Despite the concerns, the report notes that e-commerce has significantly benefited India's economy:

1. Economic Growth:

- E-commerce contributed **7.8% of total retail sales** in 2022 and is projected to grow at a **27% CAGR** between 2018 and 2030.

2. Consumer Welfare Gains:

- The convenience, cost-effectiveness, and variety provided by e-commerce have improved **consumer welfare**.

3. Employment Opportunities:

- Contrary to concerns, e-commerce has created jobs, particularly

Global Finance Central Banker Report Cards 2024

Context: The **RBI Governor** has been rated "A+" for the **second consecutive year** in the **Global Finance Central Banker Report Cards 2024**.

About Central Banker Report Cards:

- **Publication:** These report cards are published annually by the **US-based Global Finance** magazine since **1994**.
- **Scope:** The report grades the **central bank governors** of nearly **100 countries** based on their performance and effectiveness in managing their respective economies.

Grading System:

- The grades range from **A to F**, with **A** being the highest and **F** the lowest.
- The evaluation is based on several critical factors:
 1. **Inflation Control:** How well the governor manages inflation rates.
 2. **Economic Growth Goals:** Success in achieving and promoting sustained economic growth.
 3. **Currency Stability:** Maintaining the stability of the national currency.

Recognition Criteria:

- The report honours **central bank leaders** who have demonstrated exceptional performance through **originality, creativity, and tenacity** in their strategies. These leaders have successfully outperformed their global peers by effectively navigating their nations' economic challenges.

Significance of the RBI Governor's A+ Rating:

- Receiving an **A+** rating for two consecutive years highlights the **exceptional leadership** and **successful strategies** of the **RBI Governor**, particularly in navigating **India's economy** through challenging global economic conditions.
- The **rating** reflects strong management in **controlling inflation, ensuring currency stability**, and promoting **economic growth** amidst a dynamic global financial environment.

Crimes against Women 2024 - Report by ADR

Context: The **Association for Democratic Reforms (ADR)** released a report in 2024 that highlights the disturbing presence of **sitting MPs and MLAs** with declared cases related to **crimes against women**.

Key Findings from the Report:

1. **Total Number of Offenders:**
 - **151 sitting MPs/MLAs** have **declared cases** related to crimes against women.
 - A **significant portion** of these individuals belong to the **ruling party at the center**, with **one-third** of the total offenders being associated with it.
2. **Rape Cases:**
 - The report reveals that **16 sitting MPs and MLAs** have declared **cases related to rape**, indicating the severity of the issue.

Recommendations by ADR:

1. **Political Parties' Accountability:**
 - **Political parties** should **refrain from giving tickets** to candidates with declared cases related to crimes against women. This will ensure that individuals accused of such serious offenses do not hold public office.
2. **Fast-Tracking Court Cases:**
 - The report emphasizes the need for **fast-tracking court cases** against **MPs and MLAs** involved in crimes against women, ensuring that justice is delivered swiftly and effectively.

PLACES IN NEWS

Kuwait: Geopolitical and Geographical Overview

- India's **External Affairs Minister** recently called the **Prime Minister of Kuwait** to discuss **bilateral ties**, focusing on economic and political cooperation between the two nations.

Political Features

- Location:** Kuwait is located in the **Arabian Peninsula** at the **northwest corner** of the **Persian Gulf**.
- Bordering Nations:**
 - Iraq** to the **north and west**.
 - Saudi Arabia** to the **south and west**.
 - Maritime Border:** **Iran** to the **east** across the **Persian Gulf**.
- International Organizations:**
 - Kuwait is a member of the **Gulf Cooperation Council (GCC)**, **Arab League**, **Organisation of Islamic Cooperation (OIC)**, and **OPEC** (Organization of the Petroleum Exporting Countries).



Geographical Features

- Climate:** **Hyper arid desert climate** with **highly variable** temperatures and **recurrent extremes**.
- Topography:** Kuwait is largely a **desert**, with the exception of the **Al-Jahra oasis** at the **western end** of **Kuwait Bay**.
- Rivers:** **Wadi al Batin**, **Khor Bubiyan**, and **Khor al Sabiyah** are important watercourses, although Kuwait has no perennial rivers.
- Natural Resources:** Kuwait possesses **6% of the world's proven oil reserves**, making it a key player in global energy markets.

Map of Kuwait

- Capital:** **Kuwait City** (marked with a star on the map).
- Other notable places include **Al Jahrah**, **Al Ahmadi**, and **Al Salemy**.
- Key Features:** **Failakha Island**, **Warbah Island**, and the **Persian Gulf**. The border with **Saudi Arabia** is also depicted.

Kamchatka Peninsula

Context: A powerful earthquake in Russia's Far East triggered the **Shiveluch volcano** in the **Kamchatka Peninsula** on August 22, 2024.

About Kamchatka Peninsula:

Political Features:

- The **Kamchatka Peninsula** is part of the **Far Eastern Federal District** of the **Russian Federation**.
- The **Kuril Archipelago** extends from the southern tip of the Kamchatka Peninsula to the northeastern coast of **Japan's Hokkaido Island**.



- The **Kuril Islands** are **disputed** between **Russia** and **Japan**, with territorial claims from both nations.

Geographical Features:

- **Location:** The Kamchatka Peninsula is located between the **Sea of Okhotsk** to the west and the **Pacific Ocean** and **Bering Sea** to the east.
- **Mountain Ranges:** The peninsula is characterized by the **Sredinny** and **Vostochny** mountain ranges, which host numerous active volcanoes.
- **River:** The **Kamchatka River** flows through the region, serving as a significant water body.

Climate: The climate of the Kamchatka Peninsula is primarily **Tundra**, with long, cold winters and short, cool summers.

Indigenous Tribes: The peninsula is home to indigenous tribes such as the **Koryak**, **Chukchi**, and **Kamchadal**, who have traditionally lived in the region.

Significance: The **Kamchatka Peninsula** is notable for its **seismic activity**, as demonstrated by the recent earthquake and volcanic eruption. Its unique geographical features and political relevance make it a significant location in both **environmental** and **geopolitical** terms.

Republic of Panama

Context: Panama has announced more **migrant deportation flights** to **Ecuador, India, and China**.

Political Features:

- **Capital:** **Panama City**
- **Location:** Panama is a **Central American** country located on the **Isthmus of Panama**, a narrow land bridge connecting **North and South America**.
- **Neighboring Countries:**
 - **West:** **Costa Rica**
 - **East:** **Colombia**
- **Maritime Boundaries:**
 - **North:** **Caribbean Sea**
 - **South:** **Pacific Ocean**
- **Memberships:** **G-77, International Solar Alliance**, etc.



Geographical Features:

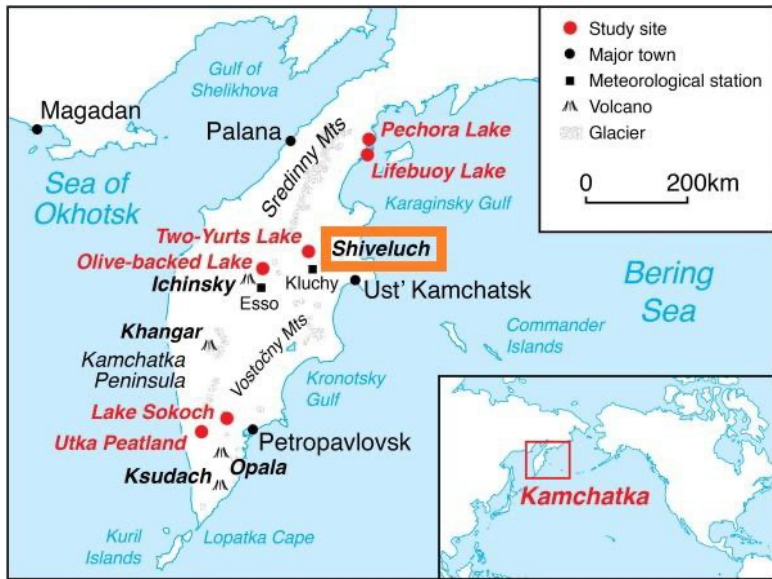
- **Climate:** **Hot and humid tropical climate** with a long **rainy season** from May to January.
- **Major Rivers:** **Río Chagres, Río Chepo**
- **Major Mountain Range:** **Cordillera Central**
- **Highest Peak:** **Barú Volcano**

Significance: Panama is geopolitically important due to its location on the **Isthmus of Panama**, acting as a key connection between **North and South America** and hosting the **Panama Canal**, which is critical for global maritime trade.

Shiveluch Volcano Eruption

Context: The **Shiveluch volcano** in **Russia** erupted following a **7.0-magnitude earthquake** that occurred off the eastern coast of the country.

- **Epicentre:** The earthquake's epicentre was located approximately **55 miles** from **Petropavlovsk-Kamchatsky**, a city on the **Kamchatka Peninsula**.



About Shiveluch Volcano:

- **Location:** Situated on the **Kamchatka Peninsula**, a region known for its **volcanic activity**.
- **Volcanic Activity:** Shiveluch is one of the most active volcanoes in Russia and has a history of frequent eruptions.

The combination of tectonic activity and volcanic eruptions in the Kamchatka region is a result of its position on the **Pacific Ring of Fire**, an area with significant seismic and volcanic activity.

Botswana (Capital: Gaborone)

Context: The world's second-largest diamond was recently unearthed in **Botswana**, which is one of the largest global producers of diamonds, accounting for **20%** of worldwide production.

Political Features:

- **Location:** A **landlocked country** in the center of **Southern Africa**.
- **Bordering Countries:**
 - **Namibia** (west and north)
 - **Zambia and Zimbabwe** (northeast)
 - **South Africa** (southeast and south)

Geographical Features:

- **Tropic of Capricorn:** Passes through Botswana.
- **Desert:** The **Kalahari Desert** covers over **70%** of Botswana's land area.
- **Major Rivers:**
 - **Okavango,**
 - **Limpopo,**
 - **Zambezi.**
- **Okavango Delta:** Africa's largest **endorheic delta** (does not flow into the ocean).

Biodiversity:

- Dominated by **savanna grasslands**.
- Hosts the **world's largest concentration of African elephants**.

Botswana's rich **diamond resources** and unique **geographical features** make it a significant country in both the global mining industry and African biodiversity conservation efforts.



Lothal

Context: As part of the Sagarmala programme, the Ministry of Ports, Shipping and Waterways is developing the National Maritime Heritage Complex (NMHC) at Lothal, Gujarat.

About Lothal:

- **Name:** The word "Lothal" is derived from Gujarati words meaning "mound of the dead."
- **Location:** Situated beside a tributary of the Sabarmati River in Gujarat, near the Gulf of Khambat.

Notable Features:

1. **Artificial Dock:** Home to the world's oldest known artificial dock, showcasing ancient maritime expertise.
2. **Fire Altars:** Found in houses and public places, indicating religious and ritualistic practices.
3. **Advanced Drainage System:** Made of burnt bricks, demonstrating urban planning and engineering.
4. **Storehouse:** Contained numerous seals and sealings, key to trade and administration.
5. **Mud Brick Houses:** Characteristic housing structures of the region.
6. **Trade Centre:** Lothal was a thriving trade hub, dealing in beads, gems, and ornaments, with trade links reaching West Asia and Africa.
7. **Natural Resources:** Located near sources of carnelian, steatite, and metal, crucial for its craftsmanship and trade.



Significance: Lothal was an important Indus Valley Civilization port city, contributing to ancient maritime trade, urban planning, and craftsmanship, making it a key archaeological and cultural site for India's maritime heritage.