

# WEEKLY UPDATES

DATE : 7th Oct – 13<sup>th</sup> Oct

## POLITY & GOVERNANCE

### Supreme Court Issues Notices to Eight States on Appointment of Acting DGPs

#### Context

- The **Supreme Court** has issued notices to **eight states** for appointing **Acting Director Generals of Police (DGPs)**, in violation of its earlier rulings in the **2006 Prakash Singh case** and a **2018 judgement**.
- **Odisha** is the only state among these that has not appointed an **Acting DGP**.

#### Supreme Court Guidelines: Prakash Singh Case (2006)

1. **Transparent Appointment Process:**
  - **DGPs must be appointed** through a **merit-based and transparent process**.
  - **Minimum fixed tenure of two years** to ensure continuity and stability in leadership.
2. **Selection of DGP:** State governments must choose the **DGP from among the three senior-most officers** recommended by the **Union Public Service Commission (UPSC)**.
3. **State Security Commission (SSC):** Every state must constitute an **SSC to shield police forces from unwarranted political influence** and ensure independence.
4. **DGP Removal:** A DGP can only be removed with the **input of the SSC**, and for specific reasons, including:
  - **Disciplinary action**
  - **Criminal conviction**
  - **Corruption**
  - **Incapacitation**
5. **Police Establishment Board (PEB):** The PEB must oversee **transfers, postings, and promotions** for officers below the **Deputy Superintendent of Police (DSP) rank**.
  - It must **recommend transfers and postings** of officers **above DSP rank**.
6. **Tenure for Field Officers:** Officers like the **Inspector General of Police (IGP), Deputy IGP, and Superintendent of Police (SP)** must also have a **minimum tenure of two years** in operational roles.

#### Supreme Court Directions: 2018 Judgement

1. **No Appointment of Acting DGPs:** States and Union Territories were directed **not to appoint Acting DGPs** under any circumstances.

### 2. UPSC Recommendation Process:

- States must **send a list of eligible senior officers** to the **UPSC** for consideration.
- The **UPSC** will prepare a **list of three suitable officers** for the post of DGP.
- States are required to appoint one of the **three shortlisted officers** as the DGP or Police Commissioner.

### Significance of the Supreme Court's Guidelines

1. **Ensuring Independence of Police:** Protects the **police force from political interference**, ensuring **professionalism and accountability** in leadership.
2. **Transparent Appointments:** Promotes **merit-based selection** to maintain public trust in the **law enforcement system**.
3. **Operational Continuity:** The guidelines ensure **continuity in leadership** through fixed tenures, helping improve **law enforcement efficiency**.
4. **Compliance Issues:** The recent notices reflect the **non-compliance** by several states, undermining **institutional reforms** in policing.

### Supreme Court Flags Discriminatory Attitude Towards Elected Women Representatives (EWRs) in Rural Areas

**Context** The **Supreme Court (SC)**, while offering relief to a **woman sarpanch removed by the district administration** in a Maharashtra village, highlighted the **resistance faced by Elected Women Representatives (EWRs) in Panchayats**.

### EWRs in Rural Governance

1. **Status in India:** Around **1.4 million women**, comprising **46% of elected representatives** in **Panchayati Raj Institutions (PRIs)**.
2. **Reservation for Women:** The **73rd Constitutional Amendment (1992)** mandated **one-third reservation** of seats for women in local bodies.
  - **States like Bihar and Chhattisgarh** have raised the proportion to **50% reservation**.
3. **Significance of EWRs:**
  - **Improved service delivery** and **reduced corruption**.
  - Promotes **inclusive governance** and **gender equality** in decision-making processes.

### Challenges Faced by EWRs in Rural Areas

1. **Rubber Stamp Candidates:** **Male family members (husbands)** often exercise **actual decision-making powers**, limiting women's autonomy.
2. **Gender Biases and Social Barriers:** **Domestic responsibilities** and **prejudiced attitudes** prevent women from bringing about meaningful social change.
3. **Restrictive State Policies:** Some states like **Rajasthan** enforce a **two-child norm** or **minimum educational qualifications** for contesting elections, excluding many women from participation.
4. **Rotation of Seats:** Due to **seat rotation policies**, women representatives often have to **discontinue** after a single term, disrupting continuity in governance.

### 5. Other Issues:

- **Digital divide** and lack of digital literacy.
- **Limited knowledge** of governance processes.
- **Cultural constraints** and doubts about their capabilities.

## Way Forward for Empowering EWRs

### 1. Institutional Reforms:

- **Recruit more women** in other Panchayat roles such as **Panchayat Secretaries**.
- **Institutional monitoring** to **curb male interference** in the decision-making of women representatives.

2. **Strengthening Women's Collective Agency: Federations of EWRs and forums like Self-Help Groups (SHGs)** can support and strengthen women's governance roles.

### 3. Capacity Building:

- **Education and training programs** for women representatives to enhance their governance skills.
- Maintain **coherent and updated data** for evaluating their performance and understanding challenges.

## Casteism in Prisons: Unconstitutional Labour Practices and Reform Needs

**Context:** On **October 3**, the **Supreme Court of India** declared **caste-based labour assignments** in prisons as **unconstitutional**.

- The ruling struck down discriminatory provisions in **State prison manuals** across over **10 states**, including **Uttar Pradesh, Tamil Nadu, and Kerala**.
- The Court found that assigning menial jobs to marginalized castes while reserving tasks like cooking for upper castes violated key **constitutional rights**.

## Key Issues Identified in Prison Manuals

1. **Caste-Based Discrimination:** Manuals segregate prisoners based on **caste** and assign specific labour according to **social hierarchies**.
  - **Example:** Segregation of Thevars, Nadars, and Pallars in **Tamil Nadu prisons**.
2. **Colonial Legacy:** Some prison rules categorize members of **denotified tribes** as "habitual offenders" or "born criminals," continuing **colonial-era stereotypes**.
3. **Labour Segregation:** Tasks like **cooking** are given to Brahmins, while marginalized castes are assigned **manual labour and cleaning duties**.

## Current Status of Indian Prisons

1. **Overcrowding:** Prisons operate at **117% capacity**, with many inmates being **under-trial prisoners**.
2. **Poor Conditions:**
  - **Inadequate hygiene, medical facilities, and reports of custodial torture** are common.
  - **Women prisoners** often lack proper care and facilities.
3. **Judicial Delays:** **Prolonged trials** and poor access to **legal aid** delay justice for inmates.

## Legal Framework Governing Prisons

### 1. Constitutional Provisions:

- **Article 14:** Right to equality.
- **Article 15:** Prohibition of **discrimination** on the basis of caste, sex, or religion.
- **Article 17:** **Abolition of untouchability**.
- **Article 23:** Prohibition of **forced labour**.

2. **Model Prison Manual (2016)** and **Model Prisons and Correctional Services Act (2023)**: Both criticized for retaining **vague definitions** of “habitual offenders” and not fully addressing caste-based discrimination.

3. **Prisons Act, 1894**: Outdated legislation that governs prison administration in India.

## Consequences of Caste-Based Discrimination in Prisons

1. **Violation of Fundamental Rights:** Caste-based labour assignments **undermine inmates’ dignity** and violate **equality** and **human rights**.

2. **Perpetuation of Social Inequality:** Reinforces **social hierarchies** and continues the **stigma** against marginalized communities even within prison walls.

3. **Obstruction to Reformation:** Caste-based tasks limit **personal growth** and restrict **rehabilitation opportunities** for inmates from marginalized communities.

## Way Forward for Prison Reforms

1. **Amendment of Prison Manuals:** States and **Union Territories** should **update prison rules** within **three months** to eliminate discriminatory practices.

2. **Legal Framework Enhancement:** Incorporate **provisions from the Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013** into prison guidelines.

3. **Regular Inspections:** **District Legal Services Authorities** and **boards of visitors** should conduct periodic inspections to identify and eliminate biases.

4. **Awareness and Sensitization:** Train **prison staff** to promote **equality and non-discrimination** in prison practices.

5. **Judicial Oversight:** Encourage strict adherence to **landmark judgments**, such as **Arnesh Kumar Vs. State of Bihar (2014)**, to protect prisoners’ rights.

## Criteria for Classical Language Status in India

### Context

- The **Union Cabinet** recently granted **Classical Language status** to five new languages, including **Marathi** and **Bengali**.
- A key shift was made in the criteria—the **requirement of an original literary tradition was removed**—allowing more languages to qualify for the status.

## Background on Classical Language Status

- **2004:** The Government of India introduced the **category of Classical Languages**.

- The goal was to **recognize languages with deep historical roots and cultural significance**.
- **Criteria revisions** were undertaken in **2005** and **2024** by the **Linguistic Experts Committee (LEC)** under the **Sahitya Akademi** to ensure fair consideration for eligible languages.

## Comparison of Old and New Criteria

Criteria	Old Criteria (2005 Revision)	New Criteria (2024 Revision)
<b>Antiquity of Texts</b>	High antiquity of early texts/recorded history over <b>1,500-2,000 years</b>	Same antiquity requirement: <b>1,500-2,000 years</b> .
<b>Ancient Literature</b>	A body of ancient texts/literature considered <b>valuable heritage</b> by generations of speakers	A body of ancient texts regarded as <b>heritage</b> by generations of speakers.
<b>Literary Tradition</b>	Must have <b>original literary traditions</b> , not borrowed from another speech community	Includes <b>knowledge texts (prose/poetry), inscriptions, epigraphical evidence</b> .
<b>Classical Language Distinction</b>	Classical language and literature must be <b>distinct from its modern form</b> or show <b>discontinuity</b> with later versions.	Classical language and literature could either be <b>distinct from its modern form</b> or show <b>discontinuity</b> with later offshoots.

## Key Changes in the 2024 Criteria

1. **Inclusion of Knowledge Texts:** Now includes **epigraphical, inscriptional evidence**, and **knowledge texts** (both prose and poetry), broadening eligibility.
2. **Removed Originality Mandate:** The earlier requirement of **non-borrowed literary tradition** has been **relaxed**, recognizing the complex evolution of languages over time.
3. **Expanded Scope for Distinctiveness:** Classical languages **need not be entirely distinct** from modern forms; they can still qualify if some discontinuity with later forms or offshoots exists.

## Languages Recommended for Classical Status (2024)

- The **Linguistic Expert Committee (LEC)** identified the following languages under the new criteria:
  1. **Marathi**
  2. **Pali**
  3. **Prakrit**
  4. **Assamese**
  5. **Bengali**

## Global Digital Compact (GDC): A Framework for Responsible Digital Governance

**Context:** The **Global Digital Compact (GDC)**, adopted during the **UN's 'Summit of the Future,'** aims to **harness digital technologies** for the **common good** while advancing **sustainable development**.

- The framework addresses challenges such as the **digital divide, data privacy**, and the **ethical use of AI**.

## Key Points on Global Digital Compact (GDC)

### 1. Nature of the GDC:

- A **non-binding diplomatic instrument** offering **guidelines** for governments, institutions, and stakeholders to govern digital technologies responsibly.
- Though non-binding, it could evolve into **soft laws** over time, influencing **international norms and practices**.

### 2. Core Objectives:

- Promotes **global cooperation** based on **international laws**, the **Universal Declaration of Human Rights**, and the **UN 2030 Agenda**.
- Focuses on **inclusive participation**, **sustainability**, and **responsible data governance** in the digital sphere.

### 3. Digital Public Goods:

- Advocates for the creation of **digital public infrastructure** through open-source software, accessible data, and AI models.
- Aims to bridge the **digital divide** and promote **sustainable development goals (SDGs)**.

### 4. Panels Established:

- **Independent International Scientific Panel on AI:** Provides recommendations for responsible AI innovation.
- **Global Dialogue on AI Governance:** Facilitates discussion on **ethical AI use and regulation** among stakeholders.

## Challenges and Criticisms of GDC

1. **Public-Private Partnerships:** While the GDC promotes partnerships between public and private sectors, **intellectual property concerns** and **confidentiality agreements** may limit openness.
2. **Self-Regulation Issues:** The GDC encourages **self-regulation** by tech firms, though past attempts have shown it to be **ineffective** in curbing misuse of digital platforms.
3. **Data Governance:** Aims to develop **interoperable data systems** but lacks comprehensive provisions for **personal data protection**.
4. **Monopoly Risks:** Involves corporate players in **data governance**, which could **encourage monopolistic control** over technologies without sufficient safeguards.
5. **Alignment with SDGs:** Digital advancements are seen as essential to achieving **SDGs**, but the **rapid evolution of AI** poses challenges for effective governance.

## Key Aspects and Their Significance

Aspect	Significance
<b>Openness in Partnerships</b>	Promotes collaboration between public and private sectors to develop <b>digital public goods</b> .
<b>Self-Regulation</b>	Encourages <b>ethical technology use</b> and <b>accountability</b> by tech firms.
<b>Data Governance</b>	Focuses on <b>interoperable data systems</b> to drive <b>innovation and economic growth</b> .
<b>Monopolistic Control</b>	Aims for <b>equitable access to data</b> but warns of risks from <b>monopolies</b> .

## Implementation

Lays the foundation for **future international laws** governing digital technology.

## UN's Role and the Importance of Global Cooperation

### • UN's Role:

- Positions the **UN** at the center of **global digital governance**, advocating for **“data flow with trust.”**
- However, the concept faces resistance from nations prioritizing **digital sovereignty** over open data flows.

- **Need for Global Cooperation:** Highlights the necessity of **multilateral** and **regional negotiations** alongside the GDC to address **local needs** effectively.

## National Commission for Backward Classes (NCBC)

**Context** The NCBC has advised the Union Government to include certain castes from Maharashtra in the **Central List of Other Backward Classes (OBCs)**.

### About NCBC

1. **Constitutional Status:** Established as a **constitutional body** under **Article 338B** of the Constitution through the **102nd Constitutional Amendment Act, 2018**.
2. **Composition:** The NCBC consists of:
  - **Chairperson**
  - **Vice-Chairperson**
  - **Three other Members**
3. **Functions of NCBC:**
  - **Investigate and monitor** matters related to **constitutional safeguards** for socially and educationally backward classes.
  - **Inquire into complaints** regarding **deprivation of rights and safeguards** for OBCs.
  - **Advise the Union and State Governments** on the inclusion and exclusion of castes in the **Central List of OBCs**.

### Relevant Constitutional Provisions

#### 1. Article 342A:

- Empowers the **President of India** to **specify socially and educationally backward classes (SEBCs)** for **States and Union Territories**.
- **Parliament's approval** is required for **inclusion or exclusion** of castes in the Central List of OBCs.

3. **Significance of NCBC's Advice:** NCBC's recommendation is **crucial** for **identifying backward classes** and ensuring their **constitutional safeguards** are enforced.

## Draft National Sports Governance Bill, 2024: Key Highlights

**Context:** The **Ministry of Youth Affairs and Sports** has released the **Draft National Sports Governance Bill, 2024** for public feedback. The bill aims to enhance **sports development, welfare of athletes, and ethical governance** of sports bodies in India.

### Aims of the Bill

1. **Promote sports development** and **ensure athlete welfare** through good governance.
2. **Establish institutional capacity** and prudential standards for the governance of **National Sports Federations (NSFs)**.
3. Provide a **unified framework for resolving sports grievances** and disputes effectively and fairly.

### Key Features of the Bill

1. **Sports Regulatory Board:** A central authority to recognize and regulate **National Sports Federations (NSFs)**.
  - Ensures **governance standards** and **ethical compliance** by NSFs.
2. **Ethical Governance Standards:** **Ethics and Dispute Resolution Commissions** will oversee **integrity, transparency, and fair conduct** in sports federations.
3. **Athletes Commission:** Dedicated **Commissions for athlete representation** will allow athletes to raise concerns and participate in **decision-making processes**.
  - **Government funding** will support the functioning of these commissions.
4. **Athlete Representation in Sports Bodies:** **10% of voting members** in sports bodies must be **top athletes** elected by the Athletes Commission.
  - Executive Committees must include at least **one male and one female athlete**.
5. **Safe Sports Policy:** Provides protection to **athletes, minors, and women** against harassment, in line with the **Protection of Women from Sexual Harassment Act, 2013**.
6. **Anti-Doping Compliance:** Enforces strict **anti-doping measures** and aligns with **international ethical standards** to ensure fair competition.
7. **Public Accountability:** Sports organizations will be subject to the **Right to Information (RTI) Act**, ensuring **transparency and accountability**.
8. **Gender Representation:** At least **30% of governing body members** must be **women**, promoting **gender diversity** in sports governance.



# INTERNATIONAL RELATIONS

## Sudan Civil War: Escalation and Humanitarian Crisis

### Context

- The **Sudanese Armed Forces (SAF)** recently launched a renewed **offensive** against the **Rapid Support Forces (RSF)** in **Khartoum** and **Bahri**.
- After a **brief lull**, the conflict has **intensified**, marking **18 months** since the start of the civil war.
- The **UN** estimates that over **20,000 people** have been killed, with **millions displaced** and **severe humanitarian challenges** emerging across the country.

### Major Places in the News

#### 1. Khartoum and Bahri

- **Khartoum:** The capital city, a key battleground for control between the **SAF and RSF**.
- **Bahri:** A northern extension of Khartoum, also witnessing **major clashes** in the offensive.

2. **Omdurman** : Located west of Khartoum, it has become a **conflict zone**, with violence spreading beyond initial battles in Khartoum.

3. **El Fasher:** A city in **Darfur**, heavily affected by **clashes**, playing a critical role in the **ongoing humanitarian crisis**.

4. **Darfur and Kordofan States:** Facing **ethnic-targeted violence** and **famine-like conditions** due to ongoing fighting and political instability.

5. **Zamzam Camp, North Darfur:** Home to **500,000 internally displaced persons (IDPs)**, the camp is experiencing **famine conditions** and severe humanitarian challenges.

6. **Jazeera State:** Struggling with a **food insecurity crisis**, similar to the conditions in **Zamzam camp**, due to disruptions caused by the conflict.

7. **El Fashaga Region:** A **border area with Ethiopia**, experiencing frequent clashes over **agricultural land** amid the instability.

8. **Abiey Region:** A **disputed area between Sudan and South Sudan**, marked by **ethnic violence** and **over 100 casualties** in recent conflicts

### Key Issues in the Conflict

1. **Escalating Violence:** Renewed clashes in **Khartoum, Bahri, and Omdurman** have worsened the situation after months of relative calm.

2. **Humanitarian Crisis: Famine and food insecurity** are widespread, especially in **North Darfur** and **Jazeera State**.

- **Displacement** of millions into camps like **Zamzam**, where basic services are severely limited.

3. **Ethnic-Targeted Violence:** Particularly in **Darfur** and **Abiey regions**, ethnic violence has escalated, deepening the humanitarian crisis.

4. **Border Tensions with Ethiopia:** Ongoing **land disputes** in the **El Fashaga region** contribute to regional instability.

### India – Maldives Relations: Strengthening Strategic and Economic Partnership

**Context :** Prime Minister Narendra Modi met President Muizzu in New Delhi, where India extended financial support to Maldives, including **INR 30 billion** and **USD 400 million** through a **currency swap agreement** to address Maldives' ongoing **economic challenges**.

#### Background on India-Maldives Relations

- Political Relations:** India has a **history of close ties** with Maldives, often acting as the **first responder** during crises, such as:
  - **Water crisis in Malé (2014)**
  - **COVID-19 pandemic** assistance
- Economic Cooperation:** India has provided **financial aid** through budgetary support and **currency swap agreements** to stabilize the Maldivian economy.
- Security Partnership:** Focus on **defense and maritime cooperation**, including efforts to counter **terrorism, piracy, and drug trafficking** in the Indian Ocean Region (IOR).
- Historic Ties:** Diplomatic relations established in **1965**, with **strong cultural and people-to-people connections** over the decades.

#### Recent Agreements and Developments

- Financial Support:** India extended **USD 400 million** in a currency swap agreement along with **INR 30 billion** to assist with Maldives' financial challenges.
- Free Trade Agreement:** Discussions initiated to **boost trade** and **economic cooperation** between the two nations.
- Defense Cooperation:** Agreements to **upgrade defense infrastructure** and provide **radar systems** for enhancing the Maldives National Defence Force (MNDF) maritime surveillance capabilities.
- Development Projects:** India's support includes:
  - **Social housing** initiatives
  - **Greater Malé Connectivity Project (GMCP)**
  - Development of **ports and airports** to promote connectivity

#### Significance of the Agreements

- Strengthening Bilateral Ties:** The agreements reinforce **India's role as a strategic partner** in the Maldives' **development and security**.
- Maritime Security:** Enhances India's **influence in the Indian Ocean Region (IOR)**, contributing to **regional security** and stability.
- Economic Stability:** Financial aid aims to **stabilize the Maldivian economy** and promote **bilateral trade** growth.
- Defense Collaboration:** Strengthening defense cooperation helps counter **terrorism, piracy, and other regional threats**.

### Challenges in India-Maldives Relations

1. **Political Instability: Anti-India sentiment** in some political factions and **changing alliances** can impact bilateral relations.
2. **China's Influence: Growing Chinese investments** in the Maldives could **counterbalance India's strategic interests**.
3. **Debt Dependency: Heavy reliance on external financial aid** raises concerns about economic stability and **dependency risks**.
4. **Environmental Issues: Rising sea levels** and environmental challenges could hinder the **long-term sustainability** of development projects.

### Way Forward

1. **Enhanced Diplomatic Engagement:** Maintain **high-level political exchanges** to address challenges and **strengthen relations**.
2. **Diversified Investments:** Promote sustainable investments in **renewable energy, tourism,** and the **blue economy** to reduce economic vulnerabilities.
3. **Maritime Security Framework:** Collaborate on **maritime security initiatives**, including **One Sun One World One Grid**, to ensure **energy security** in the IOR.
4. **Public Diplomacy:** Strengthen **people-to-people connections** through cultural, educational, and medical cooperation to **build goodwill**.

### India – ASEAN Cooperation: Strengthening Regional Partnerships

**Context:** Prime Minister Narendra Modi emphasized that the **21st century belongs to India and ASEAN nations**, underlining the importance of their **friendship** in addressing **global conflicts and tensions**.

### Recent ASEAN-India Summit

1. **Host and Venue:** Held in **Vientiane, Laos** with participation from **all 10 ASEAN member states**.
2. **Key Facts:**
  - **21st ASEAN-India Summit.**
  - **ASEAN members:** Indonesia, Thailand, Singapore, Philippines, Vietnam, Malaysia, Myanmar, Cambodia, Brunei, Laos.
  - Focused on **Indo-Pacific peace and political stability**, including **South China Sea disputes**.

### Modi's 10-Point Program

1. **ASEAN-India Year of Tourism (2025):** **USD 5 million allocated** for joint tourism promotion activities.
2. **Celebrating Act East Policy:** Focus on **youth summits, start-up festivals, hackathons,** and **cultural exchanges**.
3. **Women Scientists Conclave:** Organize events under the **ASEAN-India Science and Technology Development Fund**.
4. **Scholarship Expansion:** **Doubling scholarships** at **Nalanda University** and introducing new ones for ASEAN students.
5. **Trade Agreement Review:** Plan to **review the ASEAN-India Trade in Goods Agreement by 2025**.

6. **Disaster Resilience: USD 5 million allocated** to strengthen disaster management capabilities.
7. **Health Resilience Measures:** Initiate cooperation under the **Health Ministers' track**.
8. **Cyber Policy Dialogue:** Regular **cybersecurity dialogues** to improve digital resilience.
9. **Workshop on Green Hydrogen:** Focus on **sustainable energy** and **environmental technology** initiatives.
10. **Plant a Tree for Mother Campaign:** Invites ASEAN leaders to participate in this **green initiative** to **build climate resilience**.

### ASEAN-India Cooperation Across Key Fields

1. **Political Cooperation: Maritime security frameworks** in the Indo-Pacific through **joint naval exercises** and **anti-piracy operations**.
2. **Historical and Cultural Ties:** Annual **ASEAN-India cultural exchange programs** and think-tank dialogues to explore **shared histories** and foster deeper ties.
3. **Economic Cooperation:** Reviewing the **ASEAN-India Trade in Goods Agreement** to reduce **tariffs**, boost **exports**, and integrate sectors like **IT and textiles**.
4. **Social and Educational Initiatives:** Expansion of **scholarships and educational programs** to **build skills and foster people-to-people ties**.
5. **Defense Cooperation:** Focus on **defense technology transfers**, **cyber defense collaborations**, and **joint military training exercises** to enhance **strategic readiness**.

### Limitations and Challenges

1. **South China Sea Disputes: China's territorial claims** conflict with those of ASEAN nations (e.g., Vietnam, Philippines), complicating **regional unity**.
2. **Myanmar Crisis:** ASEAN's inability to present a **unified stance** on **Myanmar's political instability** weakens its credibility in handling internal conflicts.
3. **Economic Imbalances: Development gaps** between member countries (e.g., Singapore vs. Cambodia) limit **cohesive economic strategies**.
4. **Chinese Influence: Heavy dependence on Chinese investments** in infrastructure projects affects ASEAN's ability to assert **strategic autonomy**.

### United Nations Interim Force in Lebanon (UNIFIL)

**Context:** India raised concerns over the **worsening security situation in West Asia** after **two UN peacekeeping personnel** were injured by an **Israeli tank attack** along the **Lebanon-Israel border**.

#### About UNIFIL

1. **Establishment: UNIFIL** was created in **March 1978** by the **UN Security Council** through **Resolutions 425 and 426** in response to **Israel's invasion of Lebanon**.
2. **Mandate:**
  - **Confirm the withdrawal** of Israeli forces from southern Lebanon.

- **Restore international peace and security** in the region.
  - **Assist Lebanon** in re-establishing government authority in conflict areas.
  - **Expanded in 2006** to monitor and prevent hostile activities following the **Israel-Hezbollah conflict**.
3. **Personnel:**
- Consists of **over 10,500 peacekeepers** from **48 countries**.
  - Conducts around **14,500 operations** monthly, including joint activities with the **Lebanese Armed Forces (LAF)**.
4. **Operations:**
- **Observational in nature:** Peacekeepers can **only use force in self-defense** or to **protect civilians**.
  - **Maritime task force:** A five-vessel naval unit supporting **coastal security** and preventing **arms smuggling** into the region.
5. **Funding:** Financed through a **dedicated budget** approved annually by the **UN General Assembly** as part of the **UN Peacekeeping budget**.

### Significance of UNIFIL

1. **Peacekeeping in a Conflict Zone:** Plays a **critical role in monitoring ceasefires** and preventing the escalation of conflicts between **Israel and Hezbollah**.
2. **Support for Lebanon's Sovereignty:** Assists the **Government of Lebanon** in exercising **control over its southern region**, promoting **stability**.
3. **Maritime Security:** Helps maintain **coastal security**, preventing **arms smuggling** that could escalate tensions in the region.
4. **India's Contribution:** India has actively contributed to **UN peacekeeping missions**, including **UNIFIL**, reflecting its commitment to **global peace and security**.

### Challenges Faced by UNIFIL

1. **Increased Hostilities:** Recent clashes along the **Lebanon-Israel border** threaten the **stability of the ceasefire**.
2. **Restricted Mandate:** The **limited use of force** policy restricts peacekeepers' ability to respond proactively to **hostile actions**.
3. **Dependence on Member-State Funding:** The mission's effectiveness depends on **consistent financial support** from **UN member states**.
4. **Political Sensitivity:** UNIFIL operates in a **highly sensitive geopolitical region**, balancing **complex dynamics** between Israel, Lebanon, and Hezbollah.

## India-UAE Bilateral Investment Treaty (BIT): Strengthening Economic Ties

### Context

- The **India-UAE Bilateral Investment Treaty (BIT)**, signed in **February 2024** in **Abu Dhabi**, came into effect on **31st August 2024**.
- This new BIT replaces the **Bilateral Investment Promotion and Protection Agreement (BIPA)** signed in 2013, which **expired in September 2024**.

## About Bilateral Investment Treaties (BITs)

1. **Definition:** BITs are **reciprocal agreements** between two countries to **promote and protect foreign investments** in each other's territories.
2. **Guarantees Provided: Minimum guarantees** for foreign investments.
  - **Fair treatment** under international law and **protection from expropriation** by host countries.
3. **India's Model BIT:** India introduced a **new Model BIT text in 2015**, replacing the earlier **1993 Model BIT** to align with global trends and investor interests.

## Key Features of the India-UAE BIT (2024)

1. **Investor-State Dispute Settlement (ISDS): Arbitration mechanism** with mandatory **exhaustion of local remedies** for **three years** before international arbitration can begin.
2. **Closed Asset-based Definition of Investment:** Covers **portfolio investments** under a **restricted asset-based definition** to prevent frivolous claims.
3. **Treatment of Investments:** Ensures **no denial of justice** and **no fundamental breach of due process** for foreign investors.
4. **Protection Against Expropriation:** Provides for **compensation in case of expropriation** and ensures **transparency** in government dealings and **transferability of capital**.

## Significance of India-UAE BIT 2024

1. **UAE's Role in India's FDI:** UAE is the **seventh-largest FDI source** for India, contributing **3%** of India's total FDI inflows, amounting to **\$19 billion** between April 2000 and June 2024.
2. **Investor Confidence:** Boosts investor confidence by ensuring **non-discriminatory treatment** and **minimum standards of protection**, along with an independent **forum for arbitration** to settle disputes.

## India-UAE Relations: A Strategic Partnership

1. **Trade:** UAE is India's **third-largest trading partner** after the **US and China**.
2. **Defense Cooperation:** Conducts **joint military exercises** such as **Desert Cyclone** to enhance defense collaboration.
3. **Energy Security:** UAE is a significant supplier of **crude oil, LNG, and LPG** to India.
  - India is the **3rd largest oil importer** and **4th largest gas importer** globally.

## DEFENCE & SECURITY

### Ladakh Security: Tank Deployment and Strategic Challenges

#### Context

- The ongoing **Ukraine war** underscores the relevance of **battle tanks** alongside **long-range firepower** in modern conflicts.
- In **Eastern Ladakh**, India and China have deployed tanks at **altitudes of 13,000-15,000 feet** since the May 2020 stand-off, often with **barrels as close as 100 meters** apart.

#### Tanks in Ladakh: A Revival in Modern Warfare

1. **Resurgence of Tanks Globally:** Tanks have regained prominence as **key components** in military operations, complementing long-range firepower (as evident in the Ukraine war).
2. **Deployment on the LAC (Line of Actual Control):** Both India and China have stationed tanks at **high-altitude zones** in Ladakh.
  - **Proximity:** During the 2020 stand-off, tanks on the Pangong Tso were positioned **just 100 meters apart**, signaling heightened tensions.
3. **Technological Advancements:** Modern armoured units are equipped with **enhanced capabilities** to adapt to high-altitude combat scenarios.

#### Current Situation in Ladakh

- **T-90 Bhisma Tanks:** India has deployed T-90s along with **BMP-2 infantry carriers**, showcasing **maneuverability** and **deep-fording abilities**.
- **Operational Challenges:** Engines require **frequent revving** in cold conditions to prevent failure due to **low oxygen levels**.
- **Infrastructure Upgrades:** Strategic facilities, including **maintenance hubs** and **winterization kits**, have been established at **Nyoma** and other key areas.
- **Enhanced Presence:** India has strengthened the region with **T-72 regiments** and **artillery units** since the 2020 confrontation.

#### Challenges of High-Altitude Tank Operations

1. **Extreme Weather:** Temperatures can drop to **-40°C**, impacting tank performance and durability.
2. **Oxygen Deficiency:** Low oxygen levels affect both **crew members** and **engine efficiency**, demanding special adaptations.
3. **Wear and Tear:** Equipment degrades rapidly, requiring **frequent technical support** and a quick turnaround of **spare parts**.

4. **Logistics and Maintenance:** Transporting and maintaining heavy armoured units in **difficult terrain** requires specialized infrastructure and logistics.

## Threats from China along the LAC

1. **PLA Modernization:** China has deployed **ZTQ 15 light tanks** and **Type 96A tanks** to enhance its presence along the border.
2. **Mechanized Units:** Chinese forces have added **wheeled APCs (Armoured Personnel Carriers)** and **CSK assault vehicles** to boost mobility.
3. **Strategic Infrastructure:** China has upgraded **roads, airstrips, and troop deployment** near the LAC, intensifying the threat to Indian positions.
4. **Agility Advantage:** Chinese **light tanks** perform better than heavier tanks in **high-altitude conditions**, giving them a mobility edge.

## Indian Army's Future Plans for Ladakh

1. **Tank Upgrades:** Plans are underway to **upgrade T-72 tanks** and BMP-2 carriers with **advanced engines** and **next-gen ATGMs (Anti-Tank Guided Missiles)**.
2. **Development of Light Tank 'Zorawar':** Indigenous light tank 'Zorawar' is expected to undergo **trials by August 2025**, tailored for deployment in **Ladakh's rugged terrain**.
3. **Acquisition of Modern Vehicles:** India aims to procure **Future Ready Combat Vehicles (FRCV)** and **Future Infantry Combat Vehicles (FICV)** to bolster armoured capabilities.
4. **Countermeasures Against Modern Threats:** The army is focusing on **drone countermeasures** and **air burst ammunition** to protect armoured units from drones and loitering munitions.

## MQ-9B HALE UAVs and Nuclear Attack Submarines: Strengthening India's Defense Capabilities

**Context:** The **Cabinet Committee on Security (CCS)** has approved two key defense deals:

1. **Purchase of 31 MQ-9B High Altitude Long Endurance (HALE) UAVs** from **General Atomics**.
2. **Indigenous construction of two nuclear attack submarines (SSNs)**.

## MQ-9B UAV Deal Overview

1. **Quantity and Type:**
  - **31 UAVs:**
    - **15 Sea Guardians** for the **Indian Navy**.
    - **16 Sky Guardians** for the **Indian Army** and **Air Force**.
2. **Deal Value:** Estimated at **\$3.99 billion**.



3. **MRO Facility:** General Atomics will establish a **Global Maintenance, Repair, and Overhaul (MRO)** facility in **India** to support operations.
4. **Indigenous Content:** Amendments approved by the **Defence Acquisition Council (DAC)** include provisions for **domestic content**, promoting **Make in India**.

### Features of MQ-9B Predator UAV

1. **High-Altitude Capability:** Operates at **over 40,000 feet** with a **top speed of 442 km/h**.
2. **Endurance:** **40 hours of continuous flight**, ideal for **prolonged surveillance** missions.
3. **Payload and Armament:**
  - **Payload Capacity:** Up to **5,670 kg**.
  - Equipped with **four Hellfire missiles** and bombs for **strike capabilities**.
4. **Variants:**
  - **Sky Guardian:** Primarily for **Army and Air Force operations**.
  - **Sea Guardian:** Specialized for **maritime surveillance**; in use by the **Indian Navy since 2020**.
5. **Roles:**
  - **Surveillance and reconnaissance**.
  - **Anti-submarine and anti-surface warfare**.
  - **Electronic warfare**.
6. **Operational Flexibility:**
  - Capable of **automatic take-offs and landings**.
  - Integrates into **civil airspace** for **real-time situational awareness**.

### Nuclear Attack Submarines (SSNs): A Strategic Move

1. **Current Status:**
  - India already operates **indigenously developed SSBNs** (ballistic missile submarines).
  - The new SSNs are part of a **follow-on project** to enhance India's naval strike capability.
2. **Significance of SSNs:**
  - **Unlimited endurance** (powered by nuclear reactors), constrained only by **crew limitations**.
  - Crucial for **long-range maritime patrols, intelligence gathering, and deterrence missions**.
3. **Previous SSN Leases:** India has previously leased **two SSNs from Russia**, with a **third** expected to join soon.

### Significance of These Acquisitions

1. **Strengthening Maritime Security:** **Sea Guardian UAVs** and **SSNs** will bolster India's capabilities in **anti-submarine warfare** and **maritime surveillance**, especially in the **Indian Ocean Region**.
2. **Enhancing Operational Readiness:** The **Sky Guardian UAVs** will provide real-time intelligence and support **high-altitude operations**, giving India a strategic edge in border regions.
3. **Boosting Indigenous Capabilities:** The **MRO facility** and provisions for **domestic content** promote **self-reliance** in defense manufacturing under the **Make in India initiative**.

4. **Extended Naval Power Projection:** With SSNs, India can maintain **persistent patrols** and **strategic presence** across distant waters, reinforcing its **blue-water navy ambitions**.

## LSAM 12 (Missile Cum Ammunition Barge): Enhancing Indian Navy's Logistics

**Context:** The **Indian Navy** reached a key milestone with the **launch of LSAM 12 (Yard 80)**, the sixth vessel in a series of **eight Missile Cum Ammunition Barges**, aimed at **strengthening naval logistics**.

### About LSAM 12 (Missile Cum Ammunition Barge)

1. **Project Overview:** LSAM 12 is the **sixth barge** under the **08 x Missile Cum Ammunition Barge project**, designed to **improve logistical capabilities** for the Indian Navy.
2. **Manufacturer:** Built by **M/s SECON Engineering Projects Pvt Ltd**, an **MSME shipyard** in **Visakhapatnam**.
3. **Contract Details:** The **Ministry of Defence (MoD)** signed the **contract on 19 February 2021** with **SECON Engineering** for building the eight barges.
4. **Purpose:** Facilitates **transportation, loading, and unloading of ammunition and supplies** to naval platforms both at **jetties and outer harbours**.
5. **Design and Testing:** **Indigenously designed** under the regulations of the **Indian Register of Shipping (IRS)**.
  - **Model testing** was conducted at the **Naval Science and Technological Laboratory, Visakhapatnam**.
6. **Make in India Initiative:** Represents India's focus on **self-reliance in defense manufacturing** and aligns with the **Make in India** policy to reduce dependency on foreign defense imports.

### Significance of LSAM 12 and the Barge Series

1. **Enhanced Operational Logistics:** Improves the **efficiency of ammunition and supply transportation**, ensuring the Indian Navy's platforms always remain operationally ready.
2. **Support for Naval Operations:** Facilitates **seamless transfer of supplies** from shore-based facilities to **outer harbours and naval vessels**, contributing to **mission readiness**.
3. **Indigenous Manufacturing Push:** Reflects **India's commitment to defense indigenization**, reducing reliance on foreign-built vessels and **supporting local industries**.
4. **Boost to MSMEs:** Involvement of **MSMEs like SECON Engineering** highlights the role of small industries in **nation-building** and **defense innovation**.

# GEOGRAPHY

## Aurora Borealis Observed in Leh, Ladakh: A Rare Phenomenon

**Context:** On **October 10, 2024**, Leh, Ladakh witnessed a rare display of **aurora borealis** due to a **severe geomagnetic storm** triggered by a **coronal mass ejection (CME)** from the Sun.

### About Auroras

#### 1. What Are Auroras?

- Auroras are **natural light displays** seen as **bright, swirling curtains** in the night sky, often in shades of **green, red, blue, yellow, and purple**.
- These lights are known as **aurora borealis** (northern lights) in the **northern hemisphere** and **aurora australis** (southern lights) in the **southern hemisphere**.
- Although auroras typically occur near the **poles**, they can extend to **lower latitudes** during intense solar activity.

### Why Auroras Occur

1. **Caused by Solar Activity:** Auroras result from the interaction between **charged particles from the Sun** (solar wind) and **Earth's magnetic field**.
2. **Solar Wind and Earth's Magnetic Field:**
  - As the **solar wind** approaches Earth, most of the charged particles are **deflected** by the **magnetic field**.
  - However, some particles are **trapped** and travel along the magnetic field lines toward the **poles**.
3. **Interaction with Atmospheric Gases:** These charged particles **collide with gases** like **oxygen and nitrogen** in the **upper atmosphere**, emitting light:
  - **Oxygen** produces **green hues**.
  - **Nitrogen** creates **blue and purple tones**.
4. **Influence of Solar Flares and CMEs:** During heightened solar activity, such as **solar flares** or **coronal mass ejections (CMEs)**, the solar wind intensifies, leading to **geomagnetic storms**.
  - These storms can **expand auroras to mid-latitudes**, making them visible in regions farther from the poles, as seen recently in **Ladakh**.

### Significance of the Leh Aurora Event

1. **Uncommon Phenomenon in India:** Auroras are rarely observed in **Ladakh**, making this event a **unique astronomical occurrence** in India.
2. **Indicator of Solar Activity:** The aurora display reflects the **intensity of solar storms**, which can affect **satellites, navigation systems, and communication networks** on Earth.
3. **Enhanced Visibility:** Geomagnetic storms triggered by **CMEs** cause auroras to expand beyond polar regions, offering **unexpected sightings** in **mid-latitude areas** like Leh.

# ECONOMY

## India Becomes Fourth Nation to Cross \$700 Billion in Forex Reserves

### Context

- India has achieved a significant economic milestone, becoming the **fourth country in the world** to surpass **\$700 billion in foreign exchange (forex) reserves**.
- India now follows **China, Japan, and Switzerland** in holding this level of reserves.
- The reserves are sufficient to cover **11.9 months of imports**, well above the **six-month benchmark norm**.

### About Forex (Foreign Exchange) Reserves

#### 1. Definition:

- Forex reserves are **assets held by a central bank in foreign currencies, gold, and other financial instruments to support national currency stability** and manage economic challenges.
- In India, the **RBI Act of 1934** empowers the **Reserve Bank of India (RBI)** to act as the **custodian and manager of forex reserves**.

#### 2. Components of India's Forex Reserve (in descending order of value):

- **Foreign Currency Assets (FCA):** Valued in **currencies other than the Indian Rupee** (such as USD, Euro, Yen).
- **Gold Reserves:** Physical gold holdings maintained by the RBI.
- **Special Drawing Rights (SDRs):** Reserve assets allocated by the **International Monetary Fund (IMF)** based on a basket of five major currencies (USD, Euro, Chinese Renminbi, Japanese Yen, British Pound).
- **Reserve Tranche Position (RTP):** Represents a **country's quota with the IMF**, adjusted for IMF's holdings of the member's currency.

#### 3. Key Drivers of India's Forex Growth:

- **Foreign Direct Investment (FDI)** and **Foreign Portfolio Investment (FPI)** inflows.
- **Remittances** from the Indian diaspora.

### Significance and Need for Forex Reserves

1. **Managing Crises:** Forex reserves provide **foreign currency liquidity to absorb external shocks**, such as currency fluctuations, financial crises, or geopolitical challenges.
2. **Meeting Financial Obligations:** Helps in **repaying external debt** and **financing imports** during periods of economic uncertainty.
3. **Reassurance to Investors:** High reserves boost **market confidence**, signaling **economic stability** to investors and credit rating agencies.
4. **Currency Market Intervention:** Enhances the **RBI's capacity** to intervene in the forex market to **stabilize currency volatility**.

## MF Lite Framework: Promoting Passive Mutual Fund Investments

### Context

- On **September 30**, the **Securities and Exchange Board of India (SEBI)** introduced the **MF Lite framework** to promote **passively managed mutual fund schemes**.
- This initiative aims to **attract new players** to the mutual fund industry, offer **diversified and lower-risk investment opportunities** for retail investors, and **enhance market liquidity**.

### Features of the MF Lite Framework

1. **Relaxed Regulations:** Eases entry for new **Asset Management Companies (AMCs)** by lowering eligibility criteria such as **net worth, track record, and profitability**.
2. **Minimum Net Worth Requirement:** Sets a minimum net worth of **₹35 crore** for AMCs operating passive funds, ensuring **sufficient liquidity**.
3. **Simplified Governance:** Reduces the **oversight role of trustees**, focusing on preventing **conflicts of interest** and market misconduct in passive funds.
4. **Board-Level Operations:** Transfers **daily operational control** to the AMC's board to ensure **transparent management of fees, expenses, and tracking errors**.

### Need for a Separate Framework

1. **Lower Risk Profile:** Passive funds **mimic index performance**, making stringent regulatory requirements for active funds unnecessary.
2. **Predictable Strategy:** As passive funds track established indices, there is **minimal discretion in asset allocation**, reducing the need for tight regulations.
3. **Regulatory Simplification:** Tailors a distinct framework for passive funds, as current regulations are focused on **actively managed funds**.
4. **Enhanced Market Participation:** Attracts **new and smaller AMCs** to the ecosystem, **increasing diversity and competition**.

### Impact of the MF Lite Framework

1. **New Market Entrants:** Lower financial barriers are expected to **attract more AMCs**, increasing **competition** in the market.
2. **Increased Liquidity:** More players in the market will **improve liquidity**, enhancing **market stability**.
3. **Cost-Efficient Options:** Investors benefit from **low-cost passive funds**, focusing on **minimizing expenses and maximizing returns**.
4. **Operational Efficiency:** **Streamlined operations** through board-level oversight boost **process transparency**.

### Risks Associated with the MF Lite Framework

1. **Tracking Error:** Deviations from the benchmark can lead to **lower-than-expected returns**, affecting investor profits.

2. **Expense Management:** Even with a low Total Expense Ratio (TER), **unmanaged costs** can reduce passive fund returns.
3. **Market Volatility:** As passive funds **mirror market movements**, they are vulnerable to downturns without active intervention.
4. **Limited Flexibility:** **Lack of active management** limits the ability to respond to market shifts, potentially affecting fund performance during volatile periods.

## Rice Fortification: Enhancing Nutrition and Public Health

### Context

- The **Union Cabinet** has extended the **universal supply of fortified rice** in all **central government schemes** under the **National Food Security Act (NFSA), 2011**, until **December 2028**.
- This decision aims to address **malnutrition** and **nutritional deficiencies** across the country.

### What is Rice Fortification and Why is it Needed?

1. **Definition:** **Rice fortification** is the process of **adding essential micronutrients** to rice to enhance its **nutritional quality**, offering **health benefits** with minimal risks.
2. **Need for Rice Fortification:** India faces **high levels of malnutrition**, including widespread **anaemia** among **children, women, and men**.
  - **Malnutrition** causes stunted growth, low productivity, and various health issues, which **fortified rice** can help alleviate.
3. **Health Benefits:** Fortified rice contains nutrients like **iron, folic acid, and vitamin B12**, helping to fill the nutritional gaps in the population.
  - It can address **anaemia, birth defects, and low energy levels** among the population.
4. **Relevance:** Since **rice** is a staple food consumed by **two-thirds of India's population**, fortification offers an opportunity to **improve public health** on a large scale.

### Process of Rice Fortification

1. **Technologies Used:**
  - Methods like **coating, dusting, and extrusion** are employed to add micronutrients to rice.
  - **Extrusion** is considered the **most suitable technology** for India.
2. **Extrusion Process:** **Rice flour** is mixed with a **micronutrient premix** and water, then passed through an **extruder machine** to create **fortified rice kernels (FRKs)**.
3. **Blending:** **Fortified rice kernels** are blended with regular rice at a ratio of **10 g FRK per 1 kg of regular rice**.
4. **Shelf Life:** **Fortified rice kernels** have a **shelf life of 12 months**, allowing long-term storage without losing nutritional value.

### FSSAI Norms and Nutrients in Fortified Rice

1. **Iron:** Each kilogram of fortified rice contains **28 mg-42.5 mg** of iron to combat **iron-deficiency anaemia**.

2. **Folic Acid:** Contains **75-125 micrograms** of folic acid, essential for **preventing birth defects** and boosting **immunity**.
3. **Vitamin B-12:** Includes **0.75-1.25 micrograms** of vitamin B-12 to improve **energy levels** and prevent **nerve damage**.
4. **Additional Nutrients:** Fortified rice may also contain **zinc, vitamin A, and B vitamins (B1, B2, B3, B6)** to enhance overall health.

## Initiatives for Rice Fortification

1. **Phase 1 (2022):** Fortified rice distributed through **Integrated Child Development Services (ICDS)** and **PM POSHAN** schemes.
2. **Phase 2 (2023):** Extended to the **Public Distribution System (PDS)** in **112 Aspirational Districts** and **291 high stunting burden districts**.
3. **Phase 3 (2024):** **Universal coverage** achieved, with fortified rice provided through all **government food schemes**.
4. **Production Capacity:** India has **925 fortified rice manufacturers** with the capacity to produce **111 LMT of fortified rice annually**.

## Challenges of Rice Fortification

1. **Cost:** The annual cost of rice fortification is around **₹2,700 crore**, which could strain **budget allocations**.
2. **Quality Control Issues:** Inconsistent quality due to **varying standards** among rice mills and manufacturers.
3. **Awareness Gap:** Limited **public awareness** about the benefits of fortified rice reduces **acceptance**.
4. **Distribution Challenges:** Ensuring **uniform distribution** to remote and underprivileged areas poses **logistical difficulties**.

## Way Forward for Rice Fortification

1. **Increase Awareness:** Educate the **public** about the health benefits of fortified rice to **boost acceptance** and demand.
2. **Enhance Quality Standards:** Strengthen **quality control** mechanisms to ensure **consistent nutrient levels** in fortified rice.
3. **Expand Infrastructure:** Improve **blending facilities** and **distribution infrastructure** at rice mills to ensure smooth implementation.
4. **Monitoring and Evaluation:** Regularly **monitor** the impact of rice fortification on public health to ensure **desired outcomes**.

## UPI123 and UPI Lite: Enhancing Digital Payments in India

**Context:** To boost the adoption of UPI (Unified Payments Interface), the Reserve Bank of India (RBI) has increased transaction limits on UPI123Pay and UPI Lite.

### Recent Changes Announced by RBI

1. **UPI Lite Wallet Limit:**
  - **Wallet limit** increased from **₹2,000 to ₹5,000**.
  - **Per-transaction limit** raised from **₹500 to ₹1,000**.

- UPI123Pay Transaction Limit:** Per-transaction limit increased from ₹5,000 to ₹10,000, facilitating higher-value transactions.
- Beneficiary Account Name Look-Up:** RBI will introduce a beneficiary account name look-up feature for RTGS and NEFT transactions, similar to UPI and IMPS, enhancing payment security.

## Difference Between UPI Lite and UPI123Pay

Feature	Use Cases	UPI123Pay
Target Users	Smartphone users with internet access	Feature phone users without internet access
Transaction Methods	Direct payment using stored funds on the device	IVR, missed call, app-based, and sound-based payments
Transaction Limit	Increased from ₹500 to ₹1,000	Raised from ₹5,000 to ₹10,000
Wallet Limit	Increased from ₹2,000 to ₹5,000	No wallet limit, uses linked bank accounts
Technology Requirement	Requires internet for setup and use	Works without internet or smartphone, using basic mobile functions
Use Cases	Ideal for small, everyday transactions	Designed for financial inclusion of feature phone users

## Significance of UPI Lite and UPI123Pay

### 1. UPI Lite:

- Facilitates small-value transactions quickly using a pre-loaded wallet.
- Ideal for everyday payments such as grocery purchases and transport fares.

### 2. UPI123Pay:

- Enables feature phone users without internet to access digital payment services.
- Encourages financial inclusion by reaching users in remote areas where smartphones and internet penetration are limited.

- Enhanced Security:** The introduction of beneficiary name look-up for RTGS and NEFT will reduce errors and enhance the security of large-value transactions.

## Second All India Rural Financial Inclusion Survey (NAFIS) 2021-22

**Context:** The National Bank for Agriculture and Rural Development (NABARD) released its second All India Rural Financial Inclusion Survey (NAFIS) for 2021-22, covering one lakh rural households. The survey offers key insights into economic and financial indicators and assesses the impact of government policies on rural development post-COVID.



## Key Data and Observations

Data Category	2016-17	2021-22	Key Observations
Income Growth	₹8,059 per month	₹12,698 per month	<b>57.6% increase</b> in average monthly income, slightly higher for <b>agricultural households</b> .
Expenditure Increase	₹6,646 per month	₹11,262 per month	Significant rise in expenditure, with <b>agricultural households</b> spending more.
Financial Savings	50.6% households saved	66% households saved	Increase in savings, particularly in <b>agricultural households</b> .
Kisan Credit Card (KCC)	Not specified	44% of agricultural households	Greater KCC uptake among <b>large landholders</b> .
Insurance Coverage	25.5% with insurance	80.3% with insurance	Drastic improvement in insurance coverage, though <b>life and health insurance</b> remain limited.
Pension Coverage	18.9% receiving pension	23.5% receiving pension	Slight improvement in <b>pension access</b> for rural households.
Financial Literacy	33.9% demonstrated good literacy	51.3% demonstrated good literacy	Substantial improvement in <b>financial literacy</b> and <b>financial behavior</b> .

## Significance of the Survey Findings

- Economic Growth:** Improved income and expenditure levels reflect **better economic conditions** for rural households, helping in **poverty reduction**.
- Enhanced Financial Security:** The rise in **savings, insurance, and pension coverage** indicates improved **financial resilience** among rural communities.
- Inclusive Growth:** Increased **KCC adoption** and financial literacy point to **greater access to financial services**, empowering rural populations.
- Impact of Government Policies:** Schemes like **MGNREGS, PMAY-G, and DAY-NRLM** have been instrumental in boosting **financial inclusion** and **rural development**.

## Challenges and Limitations

- Income Disparities:** Despite rising incomes, **disparities persist** between **agricultural** and **non-agricultural households**.
- Uneven Financial Access:** States like **Goa, Kerala, and Gujarat** show **lower savings rates**, indicating **uneven financial access** across regions.
- Insurance Gaps:** **Life and health insurance** penetration remains **lower** compared to **vehicle insurance**, highlighting areas for improvement.
- Pension Shortfalls:** A significant portion of the **elderly rural population** still lacks access to **pension schemes**.

## National Maritime Heritage Complex (NMHC): A Landmark Initiative in Lothal, Gujarat

**Context:** The **Union Cabinet** has approved the development of the **National Maritime Heritage Complex (NMHC)** at **Lothal, Gujarat**, aiming to showcase **India's maritime heritage** and promote tourism and economic growth.

## About National Maritime Heritage Complex (NMHC)

1. **Location:** Situated in **Lothal, Gujarat**, under the **Ministry of Ports, Shipping, and Waterways**.
2. **Objective:** Showcases India's **maritime history and achievements**, from ancient civilizations to the modern era, in an **educational and engaging format**.
3. **Significance:**
  - **World's largest maritime museum complex.**
  - Aims to **boost tourism, create jobs**, and **enhance India's global maritime reputation**.
4. **Key Features:**
  - **Lothal recreation:** A model of the ancient Indus Valley port city.
  - **Four theme parks** dedicated to different aspects of maritime history and culture.
  - **Coastal state pavilions** showcasing India's diverse maritime traditions.
  - **Eco-resorts** for sustainable tourism.
  - **Maritime research institute** to promote academic research.
  - **Advanced museum facilities** with interactive exhibits.
5. **Development:**
  - Managed by **Tata Projects Ltd** and designed by **Architect Hafeez Contractor**.
  - Expected to generate around **22,000 jobs**, promoting **regional economic growth**.

## About Lothal

1. **Historical Importance:**
  - **Lothal** is an important **Indus Valley Civilization site**, dating back to **2,200 BC**.
  - Known as a **major trading hub**, playing a key role in ancient maritime trade.
2. **Key Discoveries:** **World's oldest artificial dock** and evidence of **bead factories, warehouses, drainage systems**, and **maritime trade** with **West Asia and Africa**.
3. **Location:** Situated in the **Bhal region of Gujarat**, accessible by **road and rail**, making it convenient for tourists.
4. **UNESCO Status:** **Nominated for the UNESCO World Heritage list**, emphasizing its importance in **ancient maritime trade and culture**.

## India's Textile Sector: Challenges and Way Forward

### Current Status of the Indian Textile Sector

1. **Market Size:** Valued at **\$153 billion** in 2021, with **\$110 billion** from the domestic market.
2. **Global Position:** India is the **third-largest textile exporter**, holding a **5.4% share** in the global market.
3. **Employment:** Provides employment to **105 million people** directly and indirectly, making it a key employment generator.
4. **Economic Contribution:** Contributes **2.3% to India's GDP** and **10.6% of manufacturing GVA** (FY23).
5. **Production Clusters:**
  - **Tamil Nadu, Gujarat, and Maharashtra** are major textile hubs.

- **Tiruppur** serves as a leading center for **knitwear production**.

### 6. Recent Performance:

- **FY22:** Exports reached **\$43.4 billion**.
- **FY23-FY24:** Decline in both **domestic demand** and **exports**.

## Reasons Behind the Slump in the Textile Sector

1. **Global Economic Slowdown: Geopolitical tensions** and reduced **international demand** have impacted exports.
2. **High Raw Material Costs:** Rising prices of **cotton** and **Man-Made Fibres (MMF)** have increased production costs, reducing competitiveness.
3. **Import Duties on Cotton:** A **10% import duty** on cotton has made domestic cotton costlier than global prices, affecting industry profitability.
4. **Supply Chain Disruptions:** Quality control issues and **supply bottlenecks** in MMF have disrupted raw material availability.

## Other Challenges Facing the Textile Sector

1. **E-commerce Disruptions:** **Direct retailing via e-commerce** is impacting small-scale manufacturers by bypassing traditional systems.
2. **Changing Consumer Preferences:** Increased demand for **comfort wear** and **sustainable fashion** has reduced demand for conventional textile products.
3. **Sustainability and ESG Compliance:** Foreign brands are demanding **sustainability and ESG (Environmental, Social, and Governance) compliance**, putting pressure on Indian manufacturers.
4. **Rising Labour Costs:** Higher labour expenses require **technological upgrades** to enhance productivity and stay competitive.

## Government Schemes Supporting the Textile Sector

1. **Amended Technology Upgradation Fund Scheme (ATUFS):** Provides **financial incentives** to promote **technology upgradation** and employment generation.
2. **Scheme for Integrated Textile Parks (SITP):** Offers **world-class infrastructure** in clusters to enhance competitiveness.
3. **SAMARTH (Scheme for Capacity Building in Textiles Sector):** Aims to **upskill 10 lakh people** in textile-related jobs to bridge the **skill gap**.
4. **Power-Tex India:** Focuses on **strengthening the power loom sector** through **modernization and subsidies**.
5. **Silk Samagra Scheme:** Promotes **silk production** through R&D, seed production, and market promotion.
6. **PM-MITRA (Mega Integrated Textile Region and Apparel Parks):** Creates **integrated textile parks** to attract investments and boost exports with modern industrial infrastructure.

## Way Forward for the Textile Sector

1. **Policy Interventions:** **Reduce or remove import duties** on cotton during off-seasons to stabilize raw material prices.

2. **Investment in Technology:** Encourage **modern technologies** and innovations to improve **efficiency** and reduce wastage.
3. **Workforce Development:** **Upskill the workforce** to align with evolving global market demands.
4. **Sustainability Initiatives:** Promote **sustainable practices** across manufacturing and supply chains to meet **international standards**.
5. **Market Diversification:** Explore **new markets** and **diversify exports** to reduce reliance on traditional markets.

## AGRICULTURE

### National Agriculture Code (NAC): A Step Towards Standardization in Agriculture

#### Context

- The **Bureau of Indian Standards (BIS)** has initiated the formulation of a **National Agriculture Code (NAC)**, modeled after the **National Building Code** and **National Electrical Code**.
- This code aims to **standardize agricultural practices** and provide comprehensive guidelines for enhancing productivity and sustainability across India.

#### About the National Agriculture Code (NAC)

**Purpose:** To create **uniform standards** for agricultural practices, enhancing **productivity** and guiding **future agricultural developments**.

#### Structure of the NAC

1. **General Principles:** Universal guidelines applicable to **all crops**.
2. **Crop-Specific Standards:** Standards for specific crops like **paddy, wheat, oilseeds, and pulses**.

#### Coverage Areas

- **Agricultural Cycle:** Covers the **entire crop lifecycle** from **selection to post-harvest** operations.
- **Post-Harvest Operations:** Includes **storage, processing, irrigation, soil health, plant health management, and traceability standards**.
- **Emerging Areas:** Incorporates guidelines for **natural farming, organic agriculture, and IoT-based farming**.
- **Input Management:** Provides standards for the use of **chemical fertilizers, pesticides, and weedicides**.

#### Objectives of the NAC

1. **Standardization of Agricultural Practices:** Develops a framework aligned with **agro-climatic zones, crop types, and socio-economic diversity**.
2. **Promoting Quality Culture:** Serves as a reference for **policymakers** and **agriculture departments** to adopt the NAC framework.
3. **Guidance for Farmers:** Acts as a decision-making guide to improve agricultural **productivity** and **efficiency**.

4. **SMART Farming and Sustainability:** Encourages **modern farming practices** focused on **sustainability, traceability, and documentation**.
5. **Capacity Building:** Supports **training initiatives** by **agriculture extension services** and **civil society organizations** to enhance skills and knowledge.

### Implementation Plan

1. **Timeline:** NAC drafting is expected to be completed by **October 2025**.
2. **Standardized Agriculture Demonstration Farms (SADF):** Experimental farms will implement and validate **standardized practices**.
3. **Training Programs:** BIS will collaborate with **agricultural universities** and **institutes** to train farmers in NAC standards.

### Significance of the NAC

1. **Standardization of Practices:** Promotes **uniform agricultural standards**, ensuring **best practices** across diverse **agro-climatic zones**.
2. **Guidance for Stakeholders:** Provides a **comprehensive framework** for **farmers, policymakers, and institutions** to make informed agricultural decisions.
3. **Support for Modern Farming:** Facilitates the adoption of **SMART farming, sustainable practices, and IoT-based technologies** to improve agricultural efficiency.
4. **Capacity Building:** Empowers **farmers and agricultural workers** through targeted **training programs**, improving productivity and **sustainable practices**.

### Limitations of the NAC

1. **Implementation Challenges:** Standardizing practices across **diverse regions** with varying climates and soil conditions is complex.
2. **Adoption Issues:** **Smallholder farmers** may face resistance due to **resource constraints** and **lack of awareness** about new practices.
3. **Dynamic Agricultural Needs:** Rapid changes in agricultural trends and technologies may require **frequent updates** to the code.
4. **Infrastructure Limitations:** **Rural infrastructure constraints** may hinder the **effective rollout** of the NAC and **training programs** for farmers.

## SCHEMES IN NEWS

### Ni-Kshay Poshan Yojana (NPY): Strengthening Nutrition Support for TB Patients

#### Context

- The **Union Health Minister** has announced **key initiatives** under the **Ni-Kshay Poshan Yojana (NPY)** to enhance **nutrition support for TB patients** and their families.
- The monthly financial support has been **increased from ₹500 to ₹1,000** to help improve treatment outcomes and reduce **out-of-pocket expenses**.

#### Recent Changes in Ni-Kshay Poshan Yojana (NPY)

1. **Increased Monthly Support:** Financial support for TB patients under **NPY** has been raised from **₹500 to ₹1,000 per month** throughout the treatment period.
2. **Additional Funding:** An additional **₹1,040 crores** has been allocated to meet the increased nutritional needs of TB patients.
3. **Energy Dense Nutritional Supplementation (EDNS):** Targeting **underweight TB patients** (BMI <18.5 kg/m<sup>2</sup>) with **nutritional supplements** for the **first two months** of treatment, covering approximately **12 lakh patients**.
4. **Expansion to Household Contacts:** The **Ni-Kshay Mitra initiative** will now extend support to **household contacts** of TB patients with **food baskets** to boost immunity and minimize treatment-related expenses.

#### About the Ni-Kshay Portal

- **Ministry:** Managed by the **Ministry of Health and Family Welfare**, Government of India.
  - **Launched:** **2018**, to digitally track and manage TB patients' treatment progress and facilitate targeted interventions.
  - **Aim:** Achieve a **TB-free India by 2025** through comprehensive support, including **nutritional aid, financial assistance, and treatment monitoring**.
- **Key Functions:**
    - Track **TB cases** and monitor **treatment adherence**.
    - Reduce transmission through **Direct Benefit Transfers (DBT)** and other interventions.

## Key Schemes to Counter TB in India

1. **Pradhan Mantri TB Mukh Bharat Abhiyaan (PMTBMBA):** Focuses on **community support** for TB patients, involving “**Ni-Kshay Mitras**” who provide **nutritional** and **social support** to patients and families.
2. **Ni-Kshay Poshan Yojana (NPY):** Provides **₹1,000 per month** to TB patients to support nutritional needs throughout the treatment period, helping reduce **out-of-pocket expenses**.
3. **Energy Dense Nutritional Supplementation (EDNS):** Targets **underweight TB patients** with special nutrition to aid in **faster recovery** during the early stages of treatment.
4. **Direct Benefit Transfers (DBT):** Ensures **financial assistance** is transferred directly to patients’ **bank accounts**, promoting **treatment adherence** by covering nutritional and medical costs.

## Significance of the Ni-Kshay Poshan Yojana

1. **Enhanced Recovery:** Improved **nutrition** leads to faster recovery and better **treatment adherence**.
2. **Economic Support:** Reduces **out-of-pocket expenses** for TB patients and their families.
3. **Community Engagement:** Involving **Ni-Kshay Mitras** strengthens **community participation** and provides essential **social support** to patients.
4. **Faster Progress towards TB-Free India:** Strengthening interventions and **financial support** aligns with India’s goal to **eliminate TB by 2025**.

## UMANG – DigiLocker Integration: Enhancing Digital Governance

### Context:

- The **National e-Governance Division (NeGD)** has announced the integration of the **UMANG app** with **DigiLocker**, enabling users to access a wide range of government services through a **single digital platform**.
- This collaboration aims to **simplify user experience** and streamline public service delivery by bringing multiple services under one interface.

## Significance of the Integration

1. **Enhanced Accessibility:** Citizens can **easily and securely access government services** using both **UMANG** and **DigiLocker** platforms.
2. **Streamlined Services:** Provides a **unified platform** for managing multiple government services, eliminating the need for **separate apps**.
3. **Promotes Digital India:** Aligns with the government’s **Digital India mission**, promoting the **digitization of public services** and **secure cloud storage** solutions.

## About UMANG App

1. **Full Form: Unified Mobile Application for New-age Governance (UMANG).**
2. **Purpose:** Provides a **single digital platform** for citizens to access **e-Governance services** ranging from **Central to Local Government bodies**.
3. **Availability:** Accessible on **Android devices**, offering easy access to various **government services** in one place.

## About DigiLocker

1. **Flagship Initiative:** Part of the **Digital India program** by the **Ministry of Electronics and Information Technology (MeitY)**.
2. **Purpose:** Provides **secure cloud-based storage** for **essential documents** and **digital certificates**, reducing the need for physical copies.
3. **Integration with UMANG:** The integration allows users to **access UMANG services via DigiLocker**, enhancing **convenience and efficiency** in managing documents and availing public services.

## Humsafar Policy: Enhancing Travel on National Highways

**Context:** Union Minister Nitin Gadkari launched the **Humsafar Policy** in New Delhi to **improve convenience on national highways** and promote the development of **wayside amenities**.

## About Humsafar Policy

1. **Ministry:** Launched by the **Ministry of Road Transport and Highways**.
2. **Introduction:** Introduced in **2024** to improve **highway travel experiences** through **wayside amenities** and promote **environmental sustainability**.
3. **Aim:**
  - Enhance the **safety, convenience, and comfort** of highway travelers.
  - Support **local economic development** and foster **ecological sustainability**.

## Key Features of the Humsafar Policy

1. **Wayside Amenities:** Standardized facilities along highways, including:
  - **Rest areas and food courts**
  - **Clean washrooms**
  - **Parking spaces** for vehicles
2. **Support for Local Communities:** Creates **business opportunities** and **employment** for **marginalized communities**, promoting **inclusive economic development**.
3. **Environmental Sustainability:** Focuses on:



- **Water and soil conservation**
  - **Waste recycling** initiatives
  - **Solar energy use** at rest stops and service areas
4. **Digital Accessibility:** Offers travelers access to services via the ‘**Rajmarg Yatra**’ app, providing information on **facilities, routes, and nearby services** in real-time.

## ENVIRONMENT & ECOLOGY

### Eturnagaram Wildlife Sanctuary: A Natural Haven Impacted by Weather Catastrophe

**Context:** A catastrophic weather event recently struck the **Eturnagaram Wildlife Sanctuary** in **Mulugu, Telangana**, flattening an estimated **50,000 trees** across **332 hectares**, leaving significant environmental damage.

#### About Eturnagaram Wildlife Sanctuary

1. **Location:** Located in **Mulugu district, Telangana**, near the borders of **Maharashtra** and **Chhattisgarh**.
  - **Distance from major cities:**
  - 100 km from **Warangal**.
  - 250 km from **Hyderabad**.
2. **Establishment:** Declared a **wildlife sanctuary in 1952** by the **Hyderabad Nizam Government**, making it one of the oldest sanctuaries in Telangana.
3. **Area:** Covers an expansive area of approximately **806 sq. km**.
4. **Water Bodies:** **Dayyam Vagu stream** divides the sanctuary, with the **Godavari River** flowing through it, providing essential water sources for wildlife.
5. **Flora:** Dominated by **tropical dry deciduous forests** with species like:
  - **Teak**
  - **Bamboo**
  - **Madhuca (Mahua)**
  - **Terminalia**
6. **Fauna:** Home to a variety of **wildlife**, including:
  - **Big Cats:** Tigers, leopards, panthers
  - **Canids:** Wolves
  - **Herbivores:** Blackbucks, nilgai, sambar, four-horned antelope
  - **Bears:** Sloth bears

- **Reptiles:** Hosts species like Mugger crocodiles, cobras, pythons, and kraits.
7. **Cultural Significance:** The **Sammakka-Saralamma Temple**, a revered religious site, is located within the sanctuary. The **Sammakka-Saralamma Jatara**, a tribal festival, attracts thousands of devotees to this region every two years.

## Impact of the Weather Event

### Environmental Devastation:

- Flattening of approximately **50,000 trees** over **332 hectares** has significantly altered the landscape.
  - The event will have long-term ecological consequences, including the **disruption of wildlife habitats** and potential **soil erosion**.
- **Challenges for Recovery:** Restoration efforts will require **reforestation** and **ecosystem rehabilitation** to recover the sanctuary's ecological balance.

## Padmaja Naidu Himalayan Zoological Park: Conservation Excellence

**Context:** The **Red Panda Program** of Padmaja Naidu Himalayan Zoological Park (PNHZP) in Darjeeling has been recognized as a **finalist for the WAZA Conservation Award 2024** for its outstanding conservation efforts.

### About Red Panda

1. **Diet:** Primarily **herbivorous**, feeding on **bamboo, berries, acorns**, and occasionally small mammals.
  2. **Behavior:** **Shy, solitary**, and **arboreal** (lives in trees).
  3. Uses its **bushy tail** for **balance** and **warmth** during winter.
  4. **Habitat:** Found in the **mountainous forests** of **Bhutan, China, India, Myanmar, and Nepal**.
    - Nearly **50% of its habitat** lies in the **Eastern Himalayas**.
1. **Conservation Status:**
- **IUCN Red List:** Endangered
  - **CITES:** Appendix I
  - **Wildlife Protection Act, 1972 (India):** Schedule I
2. **Threats to Red Panda:**
- **Habitat loss** due to deforestation.
  - Decline in **bamboo forests**, reducing food sources.

## About Padmaja Naidu Himalayan Zoological Park (PNHZP)

### 1. Location:

- Situated in **Darjeeling, West Bengal**, India.
- Located at an elevation of **7,000 feet (2,134 m)**.

### 2. Establishment:

- Founded in **1958**.
- Named after **Padmaja Naidu**, daughter of **Sarojini Naidu**, in honor of her contributions to society.

### 3. Size: Spans **67.56 acres (27.3 hectares)**, making it the **largest high-altitude zoo** in India.

### 4. Specialization: Focuses on **breeding animals adapted to alpine conditions**, including:

- **Snow leopards**
- **Himalayan wolves**
- **Red pandas**

## Conservation Efforts

1. **Red Panda Conservation:** Plays a **central role** in India's red panda conservation and **breeding programs**.
2. **Biobanking and Genetic Resource Facility:** Preserves **gametes, tissues, and DNA** of endangered species to support future conservation.
3. **Global Recognition:** Member of the **World Association of Zoos and Aquariums (WAZA)**, recognized for its efforts in wildlife conservation.
4. **Visitor Engagement:** Attracts around **300,000 visitors annually**, spreading awareness about conservation.

## Chaukhamba III Peak: A Key Summit in the Garhwal Himalayas

**Context:** Two foreign climbers, Michelle Theresa Dvorak (USA) and Fay Jane Manners (UK), were recently rescued from an elevation of **6,015 meters** near the **Chaukhamba III peak** in **Chamoli district, Uttarakhand**.

## About Chaukhamba Massif

1. **Location:** Part of the **Gangotri Group** in the **Garhwal Himalayas**, Uttarakhand, India.
2. **Proximity:** Situated **west of Badrinath**, at the **head of the Gangotri Glacier**.
3. **Summits of Chaukhamba:**
  - **Chaukhamba I:** 7,138 m (23,419 ft) — The **tallest peak** in the Gangotri range.
  - **Chaukhamba II:** 7,070 m (23,196 ft).

- **Chaukhamba III:** 6,995 m (22,949 ft).
- **Chaukhamba IV:** 6,854 m (22,487 ft).

#### 4. **Significance:**

5. Forms the **eastern anchor** of the **Gangotri Glacier**, serving as a prominent feature in the **Garhwal Himalayas**.

6. A challenging destination for climbers due to its **elevation** and harsh weather conditions, making it a significant peak in **Indian mountaineering**.

## Antarctic Warming: Ecological and Global Implications

**Context:** A recent study has revealed a **dramatic increase in plant cover** on the **Antarctic Peninsula**, driven by **rising temperatures**. The findings signal significant **ecological changes** in one of the world's most remote regions, highlighting the **impact of climate change**.

### About Antarctic Warming

1. **Warming Rate:** Antarctica is warming at a rate between **0.22°C to 0.32°C per decade**, double the **global average** of 0.14-0.18°C per decade.
2. **Antarctic Peninsula:**
  - This region is warming **five times faster** than the global average.
  - **Temperatures have increased by nearly 3°C** since **1950**.
3. **Extreme Heatwaves:**
  - **March 2022:** A heatwave raised temperatures by **39°C above average**.
  - **July 2024:** Temperatures were recorded **28°C above normal**.
4. **Sea Ice Loss: 2024:** Second-smallest Sea ice extent on record, following the record low in **2023**.

### Recent Study Findings

1. **Increased Vegetation:**
  - **Plant cover on the Antarctic Peninsula** has increased **14 times** over the past 35 years.
  - In **1986:** Less than 1 sq km of vegetation.
  - In **2021:** Nearly **12 sq km** of plant cover.
2. **Greening Rate: 2016-2021:** The rate of greening increased by over **30%**, with mosses and lichens thriving in the warmer climate.
3. **Impact on Ecosystem:** Warmer conditions may **promote soil formation** and **create opportunities for invasive species**, which could threaten **native flora and fauna**.
4. **Albedo Effect:** Increased vegetation reduces **albedo** (reflectivity), causing the land to **absorb more solar energy**, further **accelerating warming**.

## Significance of Antarctic Warming

1. **Indicator of Climate Change:** The **expansion of vegetation** in Antarctica highlights the **profound impact of global warming** on even the most remote regions.
2. **Global Repercussions:** **Rising temperatures** and **sea ice loss** in Antarctica contribute to **global sea-level rise**, posing a threat to **coastal areas worldwide**.
3. **Ecological Shifts:** The **greening of Antarctica** could alter the **ecosystem balance**, enabling **non-native species** to thrive, which may threaten **native biodiversity**.

## South Karanpura Coalfield and Hydrocarbon Potential

**Context:** Recent studies using **microscopic palynomorphs**, **organic remains**, and **geochemical assessments** reveal significant **hydrocarbon generation potential** in the **South Karanpura coalfield**, especially in the **eastern Sirka region** of Jharkhand.

### About South Karanpura Coalfield

1. **Location:** Situated in the **Ramgarh district of Jharkhand**, forming an **elongated strip along the Chingara fault**.
2. **Reserves:** Spanning **195 square kilometers** with **coal reserves** estimated at **5,757.85 million tonnes**.
3. **Mineral Richness:** Composed of **coal**, **carbonaceous shale**, and **sandstone layers**, the coalfield holds **significant workable coal deposits**.
4. **Recent Features:** **Eastern Sirka coalfield** shows high potential for **hydrocarbon generation**, especially compared to the **Giddi coalfield**.
  - Promising conditions for the exploration of **coal bed methane (CBM)** and **shale gas**.

### About Shale Gas and Oil

1. **Definition:** **Shale gas** and **shale oil** are **unconventional natural resources**, found within **shale rock formations** deep below the Earth's surface.
2. **Depth:** Located at depths of **2,500 to 5,000 meters**, deeper than **conventional crude oil** deposits found at **1,500 meters**.
3. **Extraction Process:**
  - **Deep vertical drilling** followed by **horizontal drilling** is used to access shale gas deposits.
  - Extraction commonly involves **hydraulic fracturing (fracking)**, where **high-pressure fluid** is used to break low-permeable rocks and release trapped gas.

## Significance of South Karanpura's Hydrocarbon Potential

1. **Energy Security:** Exploration of **coal bed methane (CBM)** and **shale gas** could reduce India's dependence on **imported fossil fuels**.
2. **Economic Development:** Hydrocarbon extraction could generate **employment opportunities** and boost **regional economic growth** in Jharkhand.
3. **Exploration Potential:** With favorable geological conditions, the **eastern Sirka region** could become a key center for **shale gas and methane production**.
4. **Environmental Challenges:** **Fracking** and extraction processes can pose risks to the **environment**, including **groundwater contamination** and **earthquakes**, requiring robust safety measures.

## Indian Wild Ass: Population Increase Reported in 10th Survey

**Context:** The **10th Wild Ass Population Survey** conducted by the **Gujarat Forest Department** reveals a **26.14% increase** in the population of **Indian Wild Ass**, rising from **6,082 in 2020** to **7,672 in 2024**.

### About Indian Wild Ass (*Equus hemionus khur*)

1. **Description:** It is one of the **five subspecies of the Asiatic Wild Ass**, commonly referred to as '**Ghudkhur**'.
2. **Habitat:**
  - Found primarily in the **arid zone** of the **northwestern Indian subcontinent**.
  - **Current range:** Restricted to the **Little Rann of Kutch (LRK)** in Gujarat.
3. **Behavioral Characteristics:**
  - **Solitary** and **shy** in nature, with **low population density** across its range.
  - **Dominance hierarchy:** Territorial males exhibit hierarchical dominance.
  - **Foraging behavior:** Horns (present only in adult males) are used to **browse nutrient-rich forage**.

### Conservation Status of Indian Wild Ass

1. **IUCN Red List:** **Near Threatened (NT)**
2. **Wildlife Protection Act, 1972:** **Schedule I** (provides the highest level of protection).
3. **CITES (Convention on International Trade in Endangered Species):** **Appendix I** (strictly prohibits international trade).

## Kaimur Wildlife Sanctuary to Become Bihar's Second Tiger Reserve

**Context:** The **National Tiger Conservation Authority (NTCA)** has approved the development of **Kaimur Wildlife Sanctuary (KWS)** as Bihar's **second tiger reserve**, following the **Valmiki Tiger Reserve**.

### About Kaimur Wildlife Sanctuary (KWS)

1. **Location:** Situated on the **Kaimur Hills plateau** between the **Son River (south)** and **Karmanasa River (west)**.
  - It spans across the **Central Highlands**, which include:
    - **Satpura-Maikal Hills**
    - **Vindhya-Bagelkhand Hills**
  - It is also part of the **Chota Nagpur Plateau**.
2. **Connectivity to Tiger Landscapes:** Linked to the **Bandhavgarh-Sanjay-Guru Ghasidas-Palamau tiger landscape**, contributing to a larger network for wildlife movement.
3. **Fauna:** Home to species such as:
  - **Leopards**
  - **Wild boars**
  - **Sloth bears**
4. **Forest Type:** Dominated by **Northern Tropical Mixed Dry Deciduous Forests**.

### About NTCA (National Tiger Conservation Authority)

1. **Establishment:** NTCA is a **statutory body** established under the **Wildlife (Protection) Act, 1972** to ensure tiger conservation.
2. **Role:** NTCA oversees the **implementation of Project Tiger** and provides guidance for the **establishment of new tiger reserves**.

### Significance of the Kaimur Tiger Reserve

1. **Biodiversity Conservation:** Establishing **Kaimur as a tiger reserve** will enhance the conservation of **endangered species** and protect its **rich biodiversity**.
2. **Strengthening Tiger Corridors:** Its **linkage to other tiger landscapes** ensures **genetic exchange** and **safe movement of wildlife**, aiding in long-term conservation.
3. **Boost to Ecotourism:** The reserve will attract **tourists and nature enthusiasts**, boosting **local livelihoods** through sustainable tourism.
4. **Enhancing Forest Protection:** **Tiger reserves receive additional protection**, improving overall **forest management and anti-poaching efforts**.

## '2024 Forest Declaration Assessment: Forests Under Fire' Report Released

**Context:** The **2024 Forest Declaration Assessment** tracks progress toward achieving key **global forest goals**, including **eliminating deforestation** and **restoring degraded forest landscapes** by 2030. It reviews international commitments made under agreements such as:

- **New York Declaration on Forests (2014)**
- **Glasgow Leaders' Declaration (2021)**
- **Kunming-Montreal Global Biodiversity Framework (2022)**

### Global Forest Goals and Progress

#### 1. Eliminate Deforestation by 2030:

- **Deforestation in 2023:** 6.37 million hectares were deforested, much higher than the target of **4.38 million hectares**.
- **Carbon Emissions from Deforestation:** 3.8 billion metric tons of CO<sub>2</sub> equivalent, making deforestation the **fourth-largest emitter** after **China, the US, and India**.

2. **Eliminate Tree Cover Loss in Key Biodiversity Areas (KBAs):** **1.4 million hectares of forests** were lost within **forested KBAs** in 2023, highlighting the urgent need for conservation in ecologically significant areas.

3. **Control Forest Fires:** **One-third** of the area lost to forest fires since **2001** occurred between **2019-23**, signaling an **increase in fire-related forest loss**.

4. **Restore 30% of Degraded Landscapes by 2030: Progress:** Only **18%** of the **150 million hectares restoration target** (Bonn Challenge) was achieved from **2000-2019**.

### Drivers of Deforestation

1. **Commodity Production:** **57% of global deforestation** over the past two decades was caused by **agricultural commodity production** (e.g., palm oil, soy, and cattle ranching).
2. **Shifting Agriculture in Primary Forests:** **15.9 million hectares** of primary forests were lost between **2015-2023** due to **shifting agriculture practices**.
3. **Mining Activities:** Mining volumes in **tropical moist forests** doubled between **2000-2019**, significantly contributing to deforestation.

### Recommendations from the Report

1. **Protect All Forests, Prioritize Primary Ecosystems:** **Primary and intact ecosystems** must be prioritized in **global conservation efforts** due to their ecological importance.



2. **Accelerate Restoration Efforts:** Large-scale restoration efforts are needed to achieve the **30% restoration target by 2030**, with transparent progress tracking.
3. **Address Altered Fire Patterns:** Governments should recognize **altered fire patterns as human-induced** and implement **adaptive fire management strategies**.
4. **Conservation of KBAs and High-Value Forests:** **Key Biodiversity Areas (KBAs)** and other forests with **high conservation value** should be given **priority in global and national conservation efforts**.

## Living Planet Report 2024: Key Highlights

Released by: World Wildlife Fund (WWF)

### Global Findings

1. **Biodiversity Loss:**
  - **Wildlife populations** have **declined by 73%** over the past **50 years (1970–2020)**.
  - **Freshwater populations** suffered the **heaviest losses**, followed by **terrestrial and marine populations**.
2. **Major Causes for Biodiversity Decline:**
  - **Habitat loss and degradation**.
  - **Climate change** and extreme weather events.
  - **Invasive species** displacing native flora and fauna.

### Findings on India

1. **Sustainable Consumption Patterns:** The report highlighted that **adopting India's consumption patterns worldwide** would require **less than one Earth by 2050**, promoting sustainability.
2. **Success Stories from India: Andhra Pradesh Community-Managed Natural Farming (APCNF):**
  - Cited as an example of **socio-economic benefits** and **sustainable food production** with **nature-positive impacts**.
- **India's Millet Mission:** Praised for promoting **nutritional security** and encouraging **sustainable agriculture**, supporting both **environmental and socio-economic goals**.

# BIOTECHNOLOGY & HEALTH

## New Ultrasound-Based Approach for Cancer Detection

### Context

- A novel cancer detection technique has been developed by scientists.
- This method leverages **ultrasound** to convert small sections of body tissue into microscopic droplets, which are released into the bloodstream.
- These droplets contain vital molecules like **RNA, DNA, and proteins**, helping in the identification of specific cancer types.

### Technology and Process

#### 1. High-Energy Ultrasound:

- Uses higher-frequency sound waves than traditional ultrasound.
- Allows deeper interaction with body tissues.

#### 2. Droplet Formation:

- Ultrasound waves cause tiny fragments of tissue to detach and transform into droplets.
- These droplets release molecular contents into the blood.

#### 3. Biomarker Analysis:

- Droplets contain biomarkers like **RNA, DNA, and proteins** that are extracted and analyzed.
- Helps detect types of cancer.

#### 4. Single-Cell Sensitivity:

- Capable of identifying even a **single cancer cell** in blood samples.
- Offers insights into cancer **progression and metastasis**.

### Significance of the Technique

- **Non-Invasive:** Reduces reliance on painful procedures like biopsies, making detection more patient-friendly.
- **Cost-Effective:** Likely to lower the financial burden associated with cancer diagnostics.
- **High Sensitivity:** Increases biomarker concentration by over **100 times**, improving early detection rates.
- **Versatile Application:** Potential to detect a wide range of cancers, including **breast, prostate, and melanoma**, with a single diagnostic tool.

## Challenges and Limitations

1. **Clinical Trials Needed:** Extensive testing on diverse populations is required to validate the technique.
2. **Technical Standardization Issues:** Developing standardized procedures for various cancer types remains a challenge.
3. **Biomarker Variability:** Variations in biomarker levels between cancer types may affect detection accuracy.
4. **Development Phase:** Currently experimental, with potential commercialization expected in **five years** depending on trials.

## Understanding Early Cancer Detection

- **Definition:** Refers to the identification of cancer at its initial stages, increasing the chance of effective treatment.
- **Components:**
  1. **Screening:** Testing asymptomatic individuals (e.g., **mammography** for breast cancer) to detect early signs.
  2. **Early Diagnosis:** Focusing on patients with symptoms to ensure **prompt detection** and treatment.
- **Key Differences:**
  - **Screening** targets asymptomatic people and specific cancers (e.g., breast, cervical).
  - **Early diagnosis** applies to all cancers in symptomatic patients.

## Challenges in Early Cancer Detection

1. **Risk of False Positives/Negatives:** Can lead to incorrect results, either missing cancer or suggesting it falsely.
2. **Overdiagnosis:** May result in unnecessary treatments.
3. **Limited Recommendations:** Some cancers lack screening guidelines due to risk-benefit concerns.

## Overview of Cancer

- **Definition:** A condition involving **uncontrolled cell growth**, which can spread to other body parts.
- **Global Impact:** The **second leading cause of death** worldwide, accounting for **1 in 6 deaths** (2018 data).
- **Importance of Early Detection:** Timely detection enhances the chances of successful treatment and reduces **mortality rates**.

## TDP1: A New Target for Cancer Treatment

**Context:** Scientists from the **Indian Association for the Cultivation of Science (IACS), Kolkata**, have identified **Tyrosyl-DNA phosphodiesterase 1 (TDP1)** as a key enzyme for **cancer treatment**, offering a new approach by targeting **DNA repair mechanisms** in cancer cells.

### About TDP1 (Tyrosyl-DNA Phosphodiesterase 1)

#### 1. Role:

- **TDP1** is a **DNA repair enzyme** that helps fix **DNA damage** caused by **Topoisomerase 1 (Top1) inhibitors** during cell division.
- Top1 inhibitors, used in **chemotherapy**, aim to damage DNA and disrupt the replication process in cancer cells. However, **TDP1 repairs this damage**, allowing cancer cells to **survive chemotherapy**.

2. **Activation:** TDP1 becomes highly active during the **mitotic phase** (cell division) to **repair drug-induced DNA damage**, ensuring cell survival.

#### 3. Regulation by CDK1:

- **Cyclin-dependent kinase 1 (CDK1)** regulates TDP1's activity.
- CDK1 enhances TDP1's function through **phosphorylation**, increasing its ability to resolve DNA damage.

### Significance of Targeting TDP1 and CDK1 for Cancer Therapy

1. **Enhanced Cancer Therapy:** **CDK1 inhibitors** used alongside **Top1 inhibitors** disrupt DNA repair, stopping the **cell cycle** and preventing cancer cells from surviving chemotherapy.
2. **Overcoming Drug Resistance:** TDP1 and CDK1 offer new **targets** to tackle **drug resistance** in cancer treatments, providing a path for more effective therapies.
3. **Precision Medicine:** These findings contribute to **personalized cancer treatments**, focusing on cancer cells that rely heavily on **DNA repair proteins** like TDP1.
4. **Therapeutic Potential:** Combining **CDK1 inhibitors** with existing chemotherapy drugs can **boost cancer cell elimination**, improving the **success rate** of treatments.

## Central Drugs Standard Control Organisation (CDSCO): Meeting Global Vaccine Standards

**Context:** The Central Drugs Standard Control Organisation (CDSCO), along with the National Regulatory Authority of India, has achieved compliance with the World Health Organisation's (WHO) vaccine regulatory standards, reaffirming India's standing in global pharmaceutical production.

### About CDSCO

1. **Role:** CDSCO serves as India's National Regulatory Authority (NRA), regulating the pharmaceutical and medical devices industry under the Drugs & Cosmetics Act.
2. **Functionality:**
  - Operates under the Ministry of Health & Family Welfare.
  - Headed by the Drugs Controller General of India (DCGI).
3. **Headquarters:** New Delhi, India.

### Key Responsibilities of CDSCO

1. **Approval of New Drugs:** Evaluates and approves new drugs before their introduction in the Indian market to ensure safety and efficacy.
2. **Clinical Trials Oversight:** Regulates and monitors clinical trials to ensure compliance with national and international safety standards.
3. **Drug Standards:** Establishes and maintains drug standards to ensure quality and consistency across the pharmaceutical industry.
4. **Import Control:** Monitors the quality of imported drugs to maintain safety standards within India.
5. **Coordination with State Authorities:** Collaborates with State Drug Control Organizations for drug regulation and licensing at the state level.
6. **Specialized Drug Categories:** Regulates critical categories such as vaccines, blood products, I.V. fluids, and sera in coordination with state regulators.

### Significance of CDSCO's Achievement

1. **Global Compliance:** India retains Maturity Level 3 compliance, indicating high regulatory alignment with WHO standards for vaccine regulation.
2. **Pharmaceutical Leadership:** Reinforces India's position as a leading global producer of affordable vaccines and generic medicines.
3. **Commitment to Quality:** Demonstrates India's dedication to vaccine safety, efficacy, and quality, ensuring global health collaboration and support for WHO initiatives.

## India Eliminates Trachoma as a Public Health Problem: WHO

### Context

- **WHO** has declared **India free from trachoma** as a **public health problem**, making it the **third country in the South-East Asia Region** to achieve this status, following **Nepal and Myanmar**.
- India has previously eliminated two other **Neglected Tropical Diseases (NTDs)**:
  - **Guinea Worm Disease (2000)**
  - **Yaws (2016)**

### About Trachoma

1. **Cause:** Trachoma is caused by the **bacterium *Chlamydia trachomatis***.
2. **Transmission:** It is a **contagious disease** that spreads through **contact with infected eyes, nose, or objects**.
  - If left untreated, it can lead to **irreversible blindness**.
3. **Status in India:**
  - In **1971**, trachoma-related blindness was **5%**.
  - It has now reduced to **less than 1%**, marking a significant public health achievement.
4. **Interventions for Trachoma Control:**
  - **National Programme for Control of Blindness & Visual Impairment (NPCBVI)**.
  - Adoption of the **WHO SAFE strategy**:
  - **Surgery** to correct in-turned eyelashes.
  - **Antibiotics** to treat infections.
  - **Facial cleanliness** to prevent transmission.
  - **Environmental improvements** to reduce disease spread.

### What are Neglected Tropical Diseases (NTDs)?

1. **Definition:** NTDs are a diverse group of diseases caused by **pathogens** such as **viruses, bacteria, parasites, fungi, and toxins**.
2. **Prevalence:** They are **prevalent among impoverished communities** in tropical regions living in **poor environmental conditions**.
3. **Neglect:** Called “neglected” because they are:
  - **Absent from the global health agenda**.
  - **Underfunded** at the global level.
  - **Associated with stigma and social exclusion**.

#### 4. Classification of NTDs: Helminth NTDs: Taeniasis, Lymphatic Filariasis.

- **Protozoan NTDs:** Leishmaniasis.
- **Viral NTDs:** Rabies, Dengue.
- **Bacterial NTDs:** Leprosy, Trachoma.
- **Fungal NTDs.**
- **Non-infectious NTDs:** Snakebite envenoming.
- **Ectoparasitic NTDs:** Scabies.

### Global and National Efforts to Curb NTDs

#### 1. Global Initiatives:

- **Global NTD Annual Reporting Form (GNARF).**
- **Global Vector Control Response 2017–2030 (GVCR).**
- **Kigali Declaration on NTDs (2022).**

#### 2. India's Efforts: National Vector Borne Diseases Control Programme (NVBDCP) for tackling diseases such as dengue, malaria, and filariasis.

### Significance of Eliminating Trachoma

1. **Public Health Achievement:** This milestone reflects **India's progress in tackling NTDs and improving eye health** among vulnerable populations.
2. **Global Impact:** India's elimination of trachoma showcases **effective public health strategies** and supports the **global fight against NTDs.**
3. **Social Impact:** Reduced **stigma and social exclusion** associated with the disease will improve the **quality of life** for affected individuals.

## SCIENCE & TECHNOLOGY

### Charon: Pluto's Largest Moon and New Discoveries

**Context:** Using the **James Webb Space Telescope (JWST)**, scientists have detected **carbon dioxide** and **hydrogen peroxide** on **Charon**, Pluto's largest moon. These findings provide new insights into **surface chemistry** on distant icy bodies.

#### About Charon

1. **Largest Moon of Pluto:** Charon is the **largest of Pluto's five moons**, about **half the size of Pluto**.
2. **Discovery:** Discovered on **June 22, 1978**, by **James W. Christy** and **Robert S. Harrington** at the **U.S. Naval Observatory**, Arizona.
3. **Size and Mass:**
  - **Diameter:** Approximately **1,214 kilometers** (754 miles).
  - **Mass:** More than **one-tenth** of Pluto's mass.
4. **Double Dwarf Planet System:** Due to Charon's **size and mass relative to Pluto**, the two bodies are often referred to as a **double dwarf planet system**.
5. **Mutual Tidal Locking:** Charon and Pluto are **mutually tidally locked**, meaning they always show the **same face to each other**.
6. **Orbital Characteristics:**
  - **Orbital Period:** Charon completes one orbit around Pluto in **6.4 Earth days**.
  - **Orbital Distance:** It orbits at approximately **19,640 kilometers** (12,200 miles) from Pluto.

#### Surface Composition

1. **Recent Discoveries:** Detection of **carbon dioxide** and **hydrogen peroxide** suggests complex **surface chemistry** driven by **solar radiation** or other external processes.
2. **Previously Known Substances:** **Water ice** and **ammonia-bearing compounds** were already identified on Charon's surface.

#### Charon's Significance in the Kuiper Belt

1. **Kuiper Belt Object:** Charon is in the **Kuiper Belt**, a region beyond **Neptune's orbit** containing icy objects.
2. **Scientific Importance:** It serves as a **valuable target** for studying **icy bodies** in the outer Solar System, providing insights into planetary formation and evolution.



## Major Atmospheric Cherenkov Experiment (MACE) Project

### Context

- The **MACE Observatory** was inaugurated at **Hanle, Ladakh**, marking a significant milestone for India in **cosmic-ray research**.
- The project aims to advance **scientific understanding** while contributing to the **socio-economic development of Ladakh**.

### About the MACE Project

1. **Location:**
  - **Hanle, Ladakh**, situated at an altitude of around **4,300 meters**.
  - It is the **highest imaging Cherenkov telescope in the world**.
2. **Development:** **Indigenously built** by the **Bhabha Atomic Research Centre (BARC)**, with support from **ECIL** and other Indian partners.
3. **Objective:** To study **high-energy gamma rays** and understand some of the **most energetic phenomena in the universe**, such as:
  - **Supernovae**
  - **Black holes**
  - **Gamma-ray bursts**
4. **Technology:** Uses **Cherenkov imaging technology** to detect **cosmic rays** and observe **high-energy astrophysical events**.
5. **Significance:** Positions India as a leader in **multi-messenger astronomy** and enhances its capabilities in **space research**.

### Significance of the MACE Project

1. **Scientific Advancement:** Strengthens India's role in **cosmic-ray research** and contributes to the global study of **high-energy gamma rays** and **astrophysical phenomena**.
2. **Technological Achievement:** Demonstrates India's capability to develop **world-class astronomical instruments**, promoting **self-reliance** in advanced technologies.
3. **Socio-Economic Impact:** Encourages **local talent** in Ladakh to pursue careers in **astronomy, astrophysics, and space sciences**, promoting regional development.
4. **Global Collaboration:** Aims to foster **international partnerships** in **space research**, contributing to global efforts in understanding the universe's **most energetic events**.

## Small Modular Reactors (SMRs): Unlocking Nuclear Energy Potential

### Context

- **Holtec International**, a privately-held US company, has emerged as a key player to unlock the **commercial potential** of the **India-US civil nuclear deal**, nearly **20 years after** it was signed.
- SMRs are gaining attention as a **new frontier in nuclear power generation**, offering potential advantages in terms of **safety, cost efficiency, and deployment flexibility**.

### About Small Modular Reactors (SMRs)

1. **Definition: SMRs are advanced nuclear reactors** with a power capacity of **up to 300 MW per unit**, about one-third the size of conventional nuclear reactors.
2. **Features:**
  - **Small:** Compact size makes them suitable for **diverse site installations**.
  - **Modular: Factory-assembled** and transported to installation sites, reducing on-site construction time.
  - **Nuclear Reactors:** Use **nuclear fission** to generate heat and produce electricity.

### Advantages of SMRs

1. **Longevity:** Designed to operate for **40-60 years** with **over 90% capacity factors**.
2. **Low-Carbon Electricity:** Capable of generating **large amounts of clean energy**, contributing to climate goals.
3. **Flexibility:** Ideal for **remote locations** and can be **paired with renewable energy** sources to form hybrid systems.
4. **Cost Efficiency:** **Reduced fuel requirements** and **off-site manufacturing** lower construction costs and staffing needs.
5. **Repurposing Sites:** Can be installed on **decommissioned thermal power plant sites**, using existing infrastructure and minimizing additional setup costs.

### Safety Features of SMRs

1. **Enhanced Safety:** Smaller reactors reduce the **risk of core damage** and include **passive safety systems** to prevent radioactive leaks.
  - Improved **seismic isolation** makes them safer in earthquake-prone areas.
2. **Simple Design:** Lower chance of **uncontrolled radioactive releases** compared to traditional nuclear reactors, enhancing public trust.

## Disadvantages of SMRs

1. **Limited Availability:** SMRs are still in the early stages of deployment and are not yet widely adopted for power generation.
2. **Economic Viability:** Large-scale production is needed to achieve **cost-efficiency**. Without economies of scale, they may remain expensive.
3. **Regulatory Challenges:** Licensing and regulatory frameworks are designed for **large reactors**, making **certification complex and costly** for SMRs.

## ISRO's Third Launch Pad: Expanding India's Space Capabilities

**Context:** The Indian Space Research Organisation (ISRO) is establishing a **third launch pad** at Sriharikota, Andhra Pradesh, aimed at **enhancing capabilities** for new technologies like the **New Generation Launch Vehicle (NGLV)**.

- The new pad will also provide **redundancy** for critical missions and support **future space endeavors**.

## Existing Launch Pads in India

1. **First Launch Pad (FLP):**
  - Primarily used for **PSLV missions**.
  - Located at **Sriharikota, Andhra Pradesh**.
2. **Second Launch Pad (SLP):**
  - Supports **GSLV** and **LVM-3 missions**.
  - Also situated at **Sriharikota, Andhra Pradesh**.

## Key Features of the Third Launch Pad

1. **Redundancy for Critical Missions:**
  - Acts as a **backup** for the second launch pad to **ensure uninterrupted GSLV launches**.
  - Mitigates risks by providing operational flexibility during **concurrent missions** or technical failures.
2. **Horizontal Integration for NGLV:**
  - Facilitates the **horizontal assembly** of the **New Generation Launch Vehicle (NGLV)**.
  - Focuses on efficient integration of **liquid engine boosters**, improving **assembly and turnaround time**.
3. **Increased Payload Capacity:** Designed to accommodate the **NGLV's higher payload capabilities:**
  - **20 tonnes to Low Earth Orbit (LEO)**.
  - **9 tonnes to Geosynchronous Transfer Orbit (GTO)**.

- Enhances ISRO's ability to launch **heavier payloads**, supporting future satellite and interplanetary missions.

#### 4. Integrated Stage Testing Facilities:

- Includes **stage testing facilities directly at the pad**, streamlining operations.
- Eliminates the need to rely on **Mahendragiri** facilities for stage testing, ensuring faster launch readiness

## PLACES IN NEWS

### Doddalathur Megalithic Site: An Archaeological Insight

#### Context

- A team of **archaeology scholars and students** from the **University of Mysore** is conducting an **excavation** of megalithic burial sites in **Chamarajanagar district**, Karnataka.
- The project provides insights into **Iron Age culture** and serves as a field-training opportunity for archaeology students.

#### About the Doddalathur Megalithic Site

##### 1. Location:

- **Doddalathur village**, located in **Hanur taluk** of **Chamarajanagar district**, Karnataka.
- The site lies in a **small valley** formed by the **Male Mahadeshwara Hill ranges**.

##### 2. Discovery: First identified by **C. Krishnamurti** of the **Archaeological Survey of India (ASI)** in **1961**.

##### 3. Historical Period: Corresponds to the **Iron Age** in South India, broadly spanning **1200 BC to 300 CE**.

##### 4. Significance:

- Comprises **hundreds of megalithic burials** marked by **stone circles made of large boulders**.
- Despite **agricultural expansion** and **land development**, many burials remain **intact**.

##### 5. Current Excavation:

- Conducted by the **University of Mysore** and **Mythic Society, Bengaluru**.
- Aims to explore **megalithic-iron age culture** and provide **practical training** to archaeology students.

#### Understanding Megalithic Sites

1. **Definition: Megaliths** are **large stones** used in prehistoric monuments or burial structures, often associated with the **Iron Age**.

2. **Purpose:** Constructed as **burial sites** or **memorials** to commemorate the dead (both sepulchral and non-sepulchral).
3. **Burial Types:**
  - **Dolmenoid Cists:** Tomb chambers with large capstones placed over stone slabs.
  - **Cairn Circles:** Stone circles often marking burial spots.
  - **Urns/Sarcophagi:** Terracotta containers used to hold human remains.
4. **Memorial Types: Menhirs:** Non-sepulchral, **standing stones** used as commemorative markers.

## Types of Megalithic Structures

1. **Stone Circles (Cromlechs):** Circular arrangements of stones, sometimes used as burial markers.
2. **Dolmen:** A tomb chamber with a **capstone** resting on upright stones.
3. **Cist:** A **small, stone-built box**, typically placed underground to contain remains.
4. **Monolith:** A **single standing stone** serving as a **marker or commemorative symbol**.
5. **Capstone Style:** A horizontal **capstone placed over burial chambers** without additional support stones.

## Megaliths in India: Timeline and Distribution

1. **Timeline:** Most Indian megalithic sites belong to the **Iron Age** (1500 BC to 500 BC), with some predating this period to **2000 BC**.
2. **Geographic Spread:** Megalithic structures are found across **Peninsular India**, especially in the states of:
  - Maharashtra
  - Karnataka
  - Tamil Nadu
  - Kerala
  - Andhra Pradesh
  - Telangana

## Gangaramchak and Gangaramchak-Bhadulia Coal Mine Incident: Overview

### Context

- A **coal mine explosion** in **West Bengal's Birbhum district** has claimed the lives of at least **five people**.
- The incident occurred at the **Gangaramchak-Bhadulia coal mines**, highlighting the **risks associated with mining operations** in the region.

## Places in News

### 1. Birbhum District, West Bengal

- **Location:** Situated in the **western part** of **West Bengal**, India.
- **Mineral Extraction:** **Coal mining** is prominent in the district, along with **stone quarrying activities**.

### 2. Gangaramchak and Gangaramchak-Bhadulia Coal Mines

- **Location:** Situated in the **Khoyrasole block** of **Birbhum district**, under the **Lokpur police station** jurisdiction.
- **Mineral Extracted:** These mines primarily extract **coal**, which is used by the **West Bengal Power Development Corporation Ltd. (WBPDCL)** for **energy production**.

### 3. Khoyrasole Block

- **Location:** A **block under Lokpur police station**, where **coal mining operations** are concentrated.
- **Significance:** A hub for **coal mining activities** that supports **regional energy production**.

### 4. Mohammad Bazar Area, Birbhum District

- **Location:** Another locality within **Birbhum district**.
- **Activities:** Known for **stone quarrying and mining**, with the use of **explosives** in these operations, which can pose significant safety risks.

# PERSONALITY IN NEWS

## Nobel Prize 2024 Winners

The **Nobel Prizes 2024** celebrate the groundbreaking contributions of exceptional individuals and organizations across diverse fields, embodying Alfred Nobel's vision of recognizing those whose work benefits humanity. These awards, announced annually in **six categories**—Physics, Chemistry, Physiology or Medicine, Literature, Peace, and Economic Sciences—highlight transformative achievements ranging from **artificial intelligence and gene regulation** to **nuclear disarmament and institutional economics**.

This year's laureates include scientists pushing the frontiers of **AI-driven protein prediction**, writers delving into **human trauma**, and peace activists advocating for a **nuclear-free world**. The awards emphasize the **interdisciplinary nature** of contemporary challenges and the efforts required to solve them, from advancing **machine learning technologies** to **mitigating global inequality**.

Category	Laureates	Achievement
Physics	John J. Hopfield, Geoffrey E. Hinton	For groundbreaking work in <b>artificial neural networks</b> , advancing machine learning and AI technologies.
Chemistry	David Baker, Demis Hassabis, John Jumper	For innovations in <b>computational protein design</b> and AI-based protein structure prediction (AlphaFold2).
Physiology/Medicine	Victor Ambros, Gary Ruvkun	For discovering <b>microRNA</b> and revealing its role in gene regulation, aiding in understanding diseases.
Literature	Han Kang	For <b>exploring trauma and human fragility</b> through poetic prose, enriching contemporary global literature.
Peace	Nihon Hidankyo	For promoting <b>nuclear disarmament</b> through survivor testimonies, advocating a nuclear-free world.
Economic Sciences	Daron Acemoglu, Simon Johnson, James Robinson	For research on how <b>institutions shape economic prosperity</b> , contributing to understanding inequality.



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