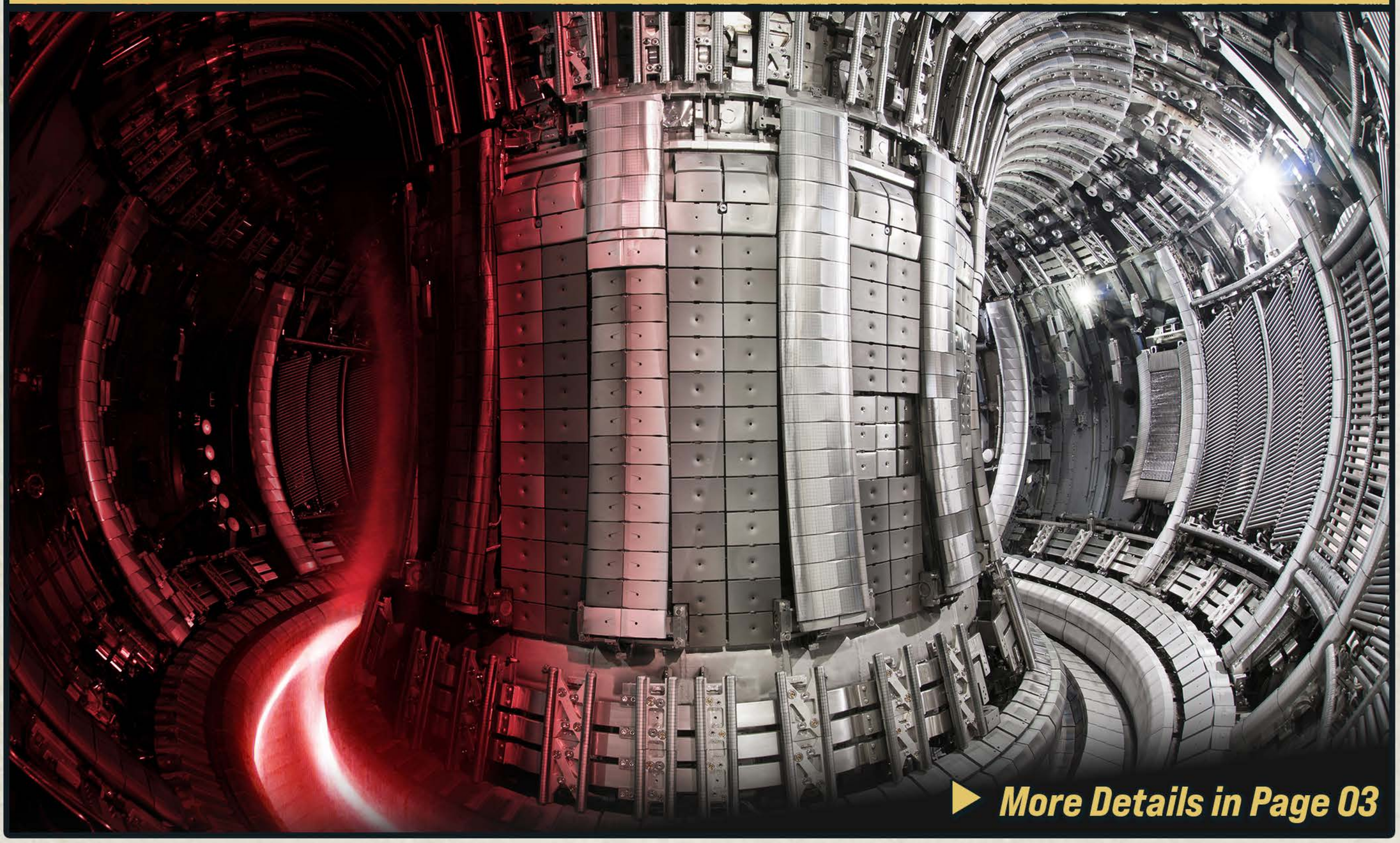
# WEEKLY NEWS

May 01-10, 2025

## ITER Fusion Reactor Project



▶ More Details in Page 03

## Cryptocurrency Trading

▶ More Details in Page 20

## HIGHLIGHTS

- UNDP Human Development
- Report '25 Pangenome of Asian Rice

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# Digital Access as a Fundamental Right

## *Why in News?*

- In Amar Jain v. Union of India & Ors., the Supreme Court ruled that inclusive and meaningful digital access is part of the fundamental right to life and liberty under Article 21.

## *Key Highlights of the Judgment*

- **Digital Access as a Right:** Recognized digital access as an instinctive component of Article 21.
- **Revised eKYC Norms:** Directed changes in digital KYC procedures to make them accessible for individuals with acid attack disfigurements or visual impairments.
- **Rights of Persons with Disabilities Act, 2016:** Court issued 20 directions to ensure the eKYC process is inclusive.
- **Principle of Substantive Equality Invoked:** Emphasized that digital transformation must be inclusive and equitable.
- **State's Obligation:** State must ensure digital infrastructure for vulnerable groups under:

  **Article 21:** Right to a dignified life

  **Article 14:** Right to Equality

  **Article 15:** Prohibition of discrimination

  **Article 38:** Promotion of social justice

## *Significance of the Judgment*

- Enhances access to government welfare schemes.
- Reduces rural-urban digital divide.
- Promotes access to online education and fintech.
- Ensures inclusion of marginalised in the digital economy.

## *Related Supreme Court Judgments*

- **Sabu Mathew George v. Union of India (2017):**

  Directed blocking of sex-determination ads.

  Clarified no restriction on access to general online information.

- **Anuradha Bhasin v. Union of India (2020):**

  Upheld internet access for freedom of speech under Article 19(1)(a) and right to trade under Article 19(1)(g).

- ***Way Forward***
  - ➪ Ensure time-bound implementation of SC directions.
  - ➪ Build accessible digital infrastructure for all.
  - ➪ Institutionalise accessibility norms in all e-governance platforms.
  - ➪ Regular audits of digital services for inclusivity and compliance.

# ITER Fusion Reactor Project

## *Why in News?*

- Scientists have successfully completed the main magnet system of the **International Thermonuclear Experimental Reactor (ITER).**
- This magnet system will power the core of ITER's Tokamak reactor.
- India has played a vital role in contributing to some of the most critical components of the reactor.

## *India's Contribution*

- Supplied the **cryostat** – a massive cooling system essential to maintain the ultra-cold temperatures required for fusion.
- Developed **heating technologies** critical to sustain the plasma conditions within the reactor.

## *About Tokamak Reactor*

- **Tokamak** is an experimental machine designed to harness the energy from nuclear fusion.
- It operates using **pulsed superconducting electromagnets** to confine plasma in a toroidal (doughnut-shaped) chamber.
- Fusion involves **combining two light atomic nuclei** to form a heavier nucleus, releasing large amounts of energy.
- Initially developed by **Soviet scientists in the late 1960s,** it remains the most promising design for magnetic fusion.
- ITER's Tokamak will be the **largest ever built:**

  **Twice the size** of Japan's JT-60SA (currently the largest).

  **Six times the plasma chamber volume.**

## *About ITER Project*

- ITER stands for **International Thermonuclear Experimental Reactor.**
- Located in **Southern France**, it is a global collaborative effort involving over **30 countries.**
- **Members include:** China, European Union (via Euratom), India, Japan, South Korea, Russia, United States
- **Objective:**

  To demonstrate the **scientific and technical feasibility** of fusion energy.

  Provide a **safe, carbon-free, and virtually limitless energy source** for the future.

- ***About ITER Project***

  ➪ **Funding:**

  **European Union** contributes **45%** (as host).

  Each of the other members contributes **9%**.

- ***Significance***

  ➪ A major step toward making **nuclear fusion a practical energy source.**

  ➪ Reinforces the importance of **global collaboration** in solving energy and climate challenges.

  ➪ India's technological contribution highlights its growing role in **cutting-edge scientific innovation.**

- ***Way Forward***

  ➪ Continue global cooperation to complete the remaining ITER construction phases.

  ➪ Focus on resolving the technical challenges of **sustained plasma confinement and energy output.**

  ➪ Prepare for the transition from experimental fusion to **commercial fusion power plants** post-ITER.

# India's Push for Creative Economy at WAVES 2025

## Why in News?

- India hosted the inaugural World Audio Visual and Entertainment Summit (WAVES) in Mumbai, 2025.
- PM highlighted the creative economy as a major pillar for future GDP growth, innovation, and inclusive development.

## Key Announcements

- **Target:** Unlock a $50 billion market by 2029.
- **New Institution:** Launch of Indian Institute of Creative Technology (IICT) for the creative sector.
  - Set up by Ministry of Information and Broadcasting in partnership with FICCI and CII.
  - Envisioned as a National Centre of Excellence.

## Creative Economy: Concept & Relevance

- **Definition:** Also called the Orange Economy, it relies on the economic potential of creative assets.
- **Sectors Included:**
  - Media and Entertainment
  - Advertising and Marketing
  - Animation, Visual Effects, Gaming, Comics, Extended Reality (AVGC-XR)
- **Global Recognition:**
  - 2021 declared as International Year of Creative Economy for Sustainable Development by the UN.

## India's Creative Economy: Current Status

- **Contribution:**
  - $30 billion to GDP
  - Employs 8% of the workforce
  - Creative exports exceed $11 billion annually

- ***India's Creative Economy: Current Status***

  ➪ **Challenges:**

  Misinformation, copyright & IP issues

  Privacy and monopolization concerns

  Limited digital access in rural areas

  Lack of formal financing

- ***Government Initiatives to Promote Creative Sector***

  ➪ **Creative Economy Fund:** $1 billion announced.

  ➪ **All India Initiative on Creative Economy (AIICE):** Launched by Indian Chamber of Commerce to harness India's creative potential.

  ➪ **National Creators Award:** Honors innovation and digital content creators in India.

- ***Way Forward***

  ➪ Strengthen institutional support via IICT and AIICE.

  ➪ Improve rural digital infrastructure.

  ➪ Ensure regulatory frameworks for IP protection and content ethics.

  ➪ Broaden access to financing for creative entrepreneurs.

# Odisha's Sahajog Initiative – Towards Urban Poverty Alleviation

## Why in News?

- **Odisha Government** has launched the **Sahajog Initiative** to provide timely assistance to the **urban poor.**
- The initiative aims to bridge the gap between **eligible beneficiaries** and **welfare schemes** through improved outreach and service delivery.

## About Sahajog Initiative

- Focuses on **identifying eligible individuals** in urban poor communities.
- Aims to **connect beneficiaries** with appropriate government schemes.
- Emphasizes:

  **Mass awareness campaigns**

  **Doorstep delivery** of welfare services

  Ensuring **inclusion of marginalized groups** in the urban setup.

## Urban Poverty in India – Key Concerns

- **Definition:** Closely tied to inadequate access to **employment, food, healthcare,** and **education**, along with lack of community voice.
- According to the World Bank's **Poverty & Equity Brief:**
- **Urban extreme poverty:** 17.2%
- **Rural extreme poverty:** 2.8%

## Why Urban Poverty is More Challenging?

- **Poor Living Conditions:** Slums lack access to basic amenities like toilets, clean water, and ventilation.
- **Expensive Services:** Healthcare, education, housing, and transport are costly and often inaccessible.
- **Barriers to Welfare Access:** Migrants lack **ID or proof of residence**, excluding them from many welfare schemes.

## *Why Urban Poverty is More Challenging?*

- **No Urban MGNREGA:** Absence of a **guaranteed income support system** like MGNREGA in urban areas.
- **Visible Inequality:** Stark contrast between slums and luxury areas (e.g., Dharavi vs. skyscrapers in Mumbai) leads to deeper perceptions of deprivation.
- **Weak Social Support:** Urban settings lack the **community bonds** found in villages, contributing to **loneliness and mental health issues.**
- **Exclusionary Urbanization:** Urban planning often ignores slum dwellers and informal settlements, leading to systemic exclusion.

## *Existing Government Initiatives for Urban Poor*

- **Housing**

  **Pradhan Mantri Awas Yojana–Urban (PMAY-U)** – Housing for all.

- **Sanitation**

  **Atal Mission for Rejuvenation and Urban Transformation 2.0 (AMRUT 2.0)** – Improved urban infrastructure and sanitation.

- **Employment and Skill Development**

  **Deendayal Antyodaya Yojana–National Urban Livelihoods Mission (DAY-NULM)**

  **PM Street Vendor's AtmaNirbhar Nidhi (PM SVANidhi)** – Micro-credit for street vendors.

- **Food Security**

  **One Nation One Ration Card** – Ensures ration portability across the country.

- **Health**

  **Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana (AB-PMJAY)** – Portability benefits for urban poor.

  **PM Ujjwala Yojana** – Self-certification to avail clean cooking fuel.

## *Way Forward*

- Strengthen **urban targeting mechanisms** to ensure no one is left out due to lack of documentation.
- Develop an **urban employment guarantee scheme** to provide a safety net for the unemployed.
- Promote **inclusive urban planning** by integrating slum dwellers and informal sector workers.
- Enhance **mental health support** and build **community networks** to reduce urban isolation.
- Ensure **technology-enabled, transparent delivery** of schemes like Sahajog for better governance and trust.

# Vizhinjam Port – India's First Dedicated Transshipment Hub

## Why in News?

- **Prime Minister** inaugurated the **Vizhinjam International Deepwater Multipurpose Seaport** in Kerala.
- The project, worth **Rs 8,800 crore,** marks India's **first dedicated container transshipment port.**

## About Transshipment Ports

- A **transshipment port** allows cargo containers to be transferred from one vessel to another before reaching their final destination.
- Such ports are crucial in international shipping to reduce travel time and improve cost efficiency.

## Vizhinjam Port – Key Features

- Developed under the **Landlord Model** with **Public Private Partnership (PPP)** on a **Design, Build, Finance, Operate and Transfer (DBFOT**) basis.
- In the landlord model:

  The **port authority** retains ownership and control.

  **Private operators** handle cargo and terminal operations.
- India's **first Greenfield port project** initiated by a **state government** (Kerala) under PPP mode.

## Strategic Importance of Vizhinjam

- **Geographical Advantage:** Located close to the **International East-West Shipping Route** connecting Europe, the Persian Gulf, and the Far East.
- **Natural Deep Draft:** Depth of nearly **20 meters,** reducing the need for capital dredging.
- **Curvilinear Coastline:** Offers protection against **tsunami impact**, lowering maintenance costs.

## *Related Infrastructure Projects*

- A **deepwater port** is under development at **Vadhvan** in Maharashtra's **Palghar district.**
- A **mega transshipment port** is also proposed at **Great Nicobar Island** in the Andaman and Nicobar Islands.

## *Need for Transshipment Hubs in India*

- **Foreign Dependence:** Currently, **around 75%** of India's transshipment cargo is handled at **foreign ports** like Colombo, Singapore, and Klang.
- **Economic Benefits:**

  Expected savings of **$80–$100 per container.**

  Potential to reduce **annual revenue loss of $200–220 million.**
- **Maritime Infrastructure Alignment:**

  Supports the objectives of: **PM Gati Shakti National Logistics Policy** and **Maritime Amrit Kaal Vision 2047**

## *Way Forward*

- **Operationalize Vizhinjam Port** swiftly to shift transshipment cargo from foreign to Indian ports.
- **Strengthen connectivity** with hinterland regions to boost cargo throughput.
- **Promote coastal shipping** and integrate with national logistics corridors.
- Encourage **private investments** and skill development in port operations.
- Continue expanding **strategic port infrastructure** like Vadhvan and Great Nicobar to enhance India's maritime footprint.

# Revival of Amaravati's Legacy

## *Why in News?*

- Prime Minister laid the foundation stone for major infrastructure projects in **Amaravati**, Andhra Pradesh.
  - Includes **Legislative Assembly, High Court, Secretariat,** and other administrative complexes.
- Laid foundation for **Navdurga Testing Range** at Nagayalanka in AP to test missiles.

## *Amaravati: The Capital of Andhra Pradesh*

- **Location:** Guntur District, along the **Krishna River.**
- **Origin:** Planned as a **greenfield capital city** post-bifurcation of Andhra Pradesh in 2014.

## *Buddhist Heritage of Amaravati*

- **Amaravati Stupa (2nd Century BCE):**
  - Among the **oldest Buddhist monuments** in India.
  - Known as the **Maha Chaitya** (The Great Stupa).
- **Kalachakra Teachings:** Believed to be where **Buddha first spread his teachings** on the "Wheel of Time."
- **Acharya Nagarjuna:** Lived in the Amaravati region. Propounded **Madhyamika philosophy,** forming the basis of **Mahayana Buddhism.**
- **Xuanzang's Visit:** Chinese pilgrim **Xuanzang** visited Amaravati in the **7th century CE** to collect Buddhist texts.

## *Historical Significance of Amaravati*

- **Satavahana Dynasty:** Served as the capital from mid-1st to early 3rd century AD.
- **Sri Amaralingeswara Swamy Temple:** A medieval temple dedicated to **Lord Shiva.**
- **Name Origin:** Amaravati means **"Place of Immortals."**

- ***Amaravati School of Art***
  - **Narrative Style:** Features **detailed stories from Buddha's life.**
  - **Dynamic Medallions:** Energetic, expressive carvings in circular forms.
  - **Naturalism:** Realistic depictions enhance visual storytelling.
  - **Architectural Elements:** Art mostly appears on **railings, plinths, and stupa elements.**
  - **Material:** Sculpted in **white marble-like stone** for fine detail.
  - **Example:** Buddha statue at **Nagarjunakonda** in Amaravati style.

- ***Way Forward***
  - Fast-track construction of administrative infrastructure in Amaravati.
  - Promote Amaravati as a **heritage tourism hub** leveraging its Buddhist and Satavahana legacies.
  - Preserve and showcase Amaravati's **artistic and historical contributions** to global Buddhist culture.
  - Strengthen local employment and education through cultural economy and missile testing facility.

# Genome-edited Rice: A Global First by India

## Why in News?

- India becomes the **first country** in the world to develop **genome-edited rice varieties.**
- Developed by **ICAR** using **CRISPR-Cas** technology without inserting foreign DNA.
- Approved under India's biosafety norms (for **SDN-1** and **SDN-2** types).
- Supported by the **National Agricultural Science Fund (NASF).**

## About the Genome-edited Rice Varieties

**1. DRR Dhan 100 (Kamala)**

Developed by: **ICAR–Indian Institute of Rice Research (IIRR), Hyderabad.**

Base variety: **Samba Mahsuri.**

Target gene: **CKX2 (Cytokinin Oxidase 2)** – regulates plant hormone for growth and cell division.

**2. Pusa DST Rice 1**

Developed by: **ICAR–Indian Agricultural Research Institute (IARI), New Delhi.**

Base variety: **MTU1010 (Cottondora Sannalu).**

## About Genome Editing Technology

- **CRISPR-Cas based gene-editing:** Allows precise changes in DNA without foreign gene insertion.
- **Types of Site Directed Nuclease (SDN):**

  **SDN-1:** Mutation without template.

  **SDN-2:** Mutation using a template.

  **SDN-3:** Insertion using a DNA template (not approved for general crops in India).

## *Benefits of Genome-edited Rice*

- **Productivity:** 19% increase in yield.
- **Water Conservation:** Saves 7,500 million cubic meters of irrigation water.
- **Climate Adaptability:** 20% reduction in greenhouse gas emissions.
- **Stress Resistance:** Improved drought, salinity, and climate resilience.

## *Significance*

- Supports **sustainable agriculture** with **high yield and low environmental impact.**
- Contributes to **climate-resilient crop development** under national food security goals.
- A step forward in **next-generation crop improvement** using indigenous technology.

## *Way Forward*

- Scaling up production and distribution to benefit farmers across India.
- Public awareness and capacity-building on genome editing safety and benefits.
- Strengthen **biosafety and regulatory mechanisms** for other crops.

# Mediation – A Tool for Realizing Viksit Bharat by 2047

## Why in News?

- The **President of India** addressed the **First National Conference on Mediation** held in New Delhi.
- The event led to the launch of the **Mediation Association of India**, aimed at institutionalizing mediation as a preferred dispute resolution method.

## About Mediation

- **Definition:** A form of **Alternative Dispute Resolution (ADR),** alongside **Arbitration** and **Conciliation**.
- **Process:** Involves a **neutral third party** who facilitates dialogue and negotiation between parties to resolve disputes **mutually**.

## Key Benefits of Mediation

- **Reduces Judicial Burden:**

  As per **India Justice Report (IJR) 2025,** pending court cases in India have surpassed **5 crore.**

  Between **2016 and early 2025, 7,57,173 cases** were resolved through mediation.

- **Cost-Effective and Time-Saving:**

  Eliminates prolonged legal procedures and high litigation costs.

- **Promotes Co-operative Solutions:**

  Encourages communication, compromise, and voluntary settlement.

  Helps maintain relationships, especially in civil, family, and commercial disputes.

## Steps Taken to Promote Mediation in India

- **Mediation Act, 2023:** Provides a **comprehensive legal framework** to institutionalize mediation.
- **Amendment to Commercial Courts Act, 2015 (in 2018):** Introduced **Pre-Institution Mediation and Settlement (PIMS)** for commercial disputes.
- **Consumer Protection Act, 2019:** Facilitates **easy, affordable, and fast mediation** of consumer grievances.

## *Steps Taken to Promote Mediation in India*

- **International Recognition:** India is a **signatory to the Singapore Convention on Mediation,** promoting cross-border enforcement of mediated settlements.

## *Role of the Mediation Association of India*

- **Purpose:**

  To **organize and promote mediation** across sectors.

  To improve **accessibility**, awareness, and trust in mediation.

- **Functions:**

  Build capacity through **training** and **institutional support.**

  Serve as a **platform for stakeholders** to collaborate and share best practices.

## *Comparison with Other ADR Mechanisms*

| Aspect | Mediation | Arbitration | Conciliation |
|---|---|---|---|
| **Nature** | Informal, mutual consent-based | Formal, governed by legal procedure | Informal and voluntary |
| **Role of Third Party** | Neutral facilitator; no decision imposed | Arbitrator gives a binding decision | Conciliator may suggest settlement |
| **Binding Nature** | Non-binding unless agreed and formalized | Binding and enforceable | Binding only if accepted by both parties |
| **Enforceability** | Requires conversion to legal contract | Legally enforceable | Binding if parties agree to terms |

## *Way Forward*

- **Expand Awareness Campaigns:** Increase public understanding of mediation as a viable legal option.
- **Institutional Strengthening:** Enhance infrastructure and training under the Mediation Association of India.
- **Mandatory Mediation:** Encourage **mandatory pre-litigation mediation** for certain civil matters.
- **Digital Mediation Platforms:** Promote **online dispute resolution** for better access in remote areas.
- **Judicial Encouragement:** Courts can proactively refer suitable cases to mediation to reduce pendency.

## *Conclusion*

- Mediation has immense potential to deliver **timely, cost-effective, and amicable justice,** making it a critical instrument for achieving the vision of a **Viksit Bharat by 2047.**

# Record-Breaking Exports by India in FY 2024–25

## Why in News?

- India achieved its **highest-ever total exports** in **Financial Year 2024–25**, reaching **$824.9 billion**, marking a **6.01% increase** from **$778.1 billion** in 2023–24.
- This growth occurred **despite a global economic slowdown** due to factors like: Red Sea crisis, Ukraine war, Panama Canal drought, Rise in non-tariff measures, Increasing energy prices

## Key Export Data (FY 2024–25)

- **Total Exports (Merchandise + Services):** $824.9 billion
- **Merchandise Exports:** $437.4 billion (slight increase from $437.1 billion in 2023–24)
- **Services Exports:** $387.5 billion (historic high, up 13.6% from $341.1 billion in 2023–24)

## Factors Behind Export Growth

- **Policy Support**
  - **New Foreign Trade Policy**
  - **Sector-specific export schemes**
  - **Trade Facilitation Initiatives**
  - **Districts as Export Hubs Programme**
  - **Targeted MSME support**
- **Market Diversification**
  - Increased export demand from Southeast Asia, Africa, Latin America
  - Helped **offset weaker demand** in traditional markets
- **Strategic Trade Agreements**
  - Bilateral and multilateral agreements boosted access to global markets
  - Example: **India-UAE Comprehensive Economic Partnership Agreement (CEPA)**
  - Led to **tariff reduction** and easier market access, especially in **services and electronics**
- **Global Supply Chain Realignment**
  - India emerged as a **trusted alternative** in the **China-plus-one strategy**
  - Attracted **multinational investments** in manufacturing and services

## *Significance of the Achievement*

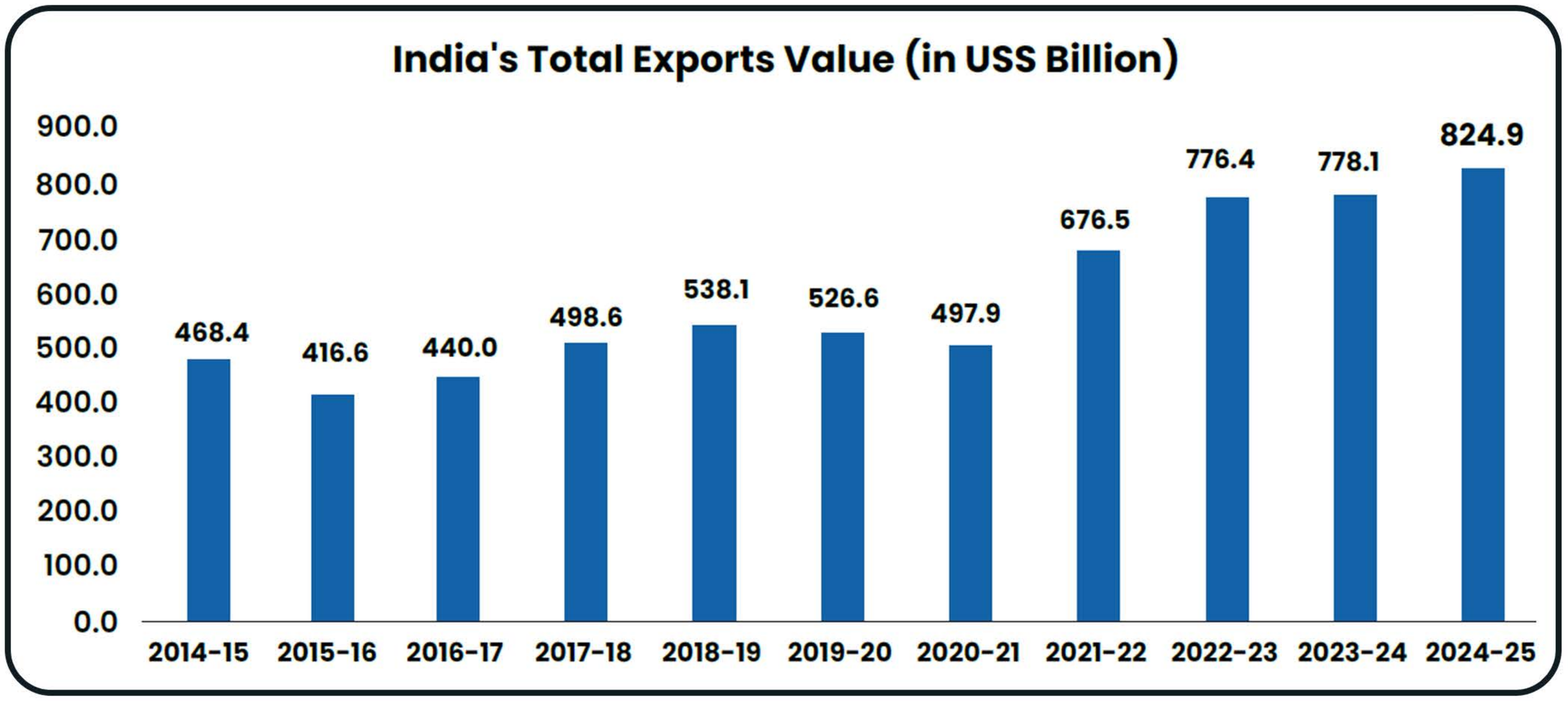
- Demonstrates India's **economic resilience** amid global disruptions
- Validates the success of government policies to **diversify and modernize exports**
- Enhances India's global trade reputation, especially in **IT services and electronics**

## *Way Forward*

- **Strengthen Logistics and Infrastructure:** Improve port efficiency, digital customs, and last-mile connectivity under PM Gati Shakti
- **Boost High-Value Exports:** Focus on electronics, pharmaceuticals, green technologies, and defence manufacturing
- **Expand Free Trade Agreements (FTAs):** Deepen ties with regions like **EU, GCC,** and **Africa**
- **Support Services Sector:** Continue incentives and policy stability in **IT, education, finance, and tourism services**
- **Enhance MSME Participation:** Promote digital platforms, credit access, and branding for small exporters

## *Conclusion*

- India's record exports in FY 2024–25 showcase the country's **growing competitiveness and policy-driven resilience,** placing it on track to become a **leading global trade hub** in the years to come.



# Rising Gold Share in Forex Reserves

## *Why in News?*

- Share of gold in India's foreign exchange reserves has doubled in the last four years.
- RBI's gold holdings now stand at **11.70%** (879.59 metric tonnes) of total forex reserves.
- Reflects a broader **global trend** of central banks increasing gold reserves.

## *India's Foreign Exchange Reserve Composition*

- Foreign Currency Assets
- Gold Holdings by RBI
- Special Drawing Rights (SDRs)
- Reserve Position in the IMF (excluded from forex reserves by some nations due to limited immediate availability)

## *Reasons for Central Banks Hoarding Gold*

- **Diversification from US Dollar:** Reduces dependence on dollar amidst risk of its devaluation.
- **Hedge Against Inflation:** Gold maintains value and protects purchasing power.
- **Geopolitical Risk Mitigation:** Safer than fiat currencies or government bonds in times of global uncertainty.
- **Fiat Currency:** Government-issued currency not backed by a commodity like gold or silver.

## *Risks of Gold Holdings*

- **Low Liquidity:** Harder and slower to convert into cash compared to foreign currencies.
- **No Yield:** Unlike bonds or deposits, gold does not generate interest or dividends.
- **High Storage and Security Costs:** Physical storage demands expensive infrastructure, including vaults (often overseas like Bank of England), insurance, and transport.

## *Way Forward*

- Balance gold accumulation with liquid, yield-generating assets.
- Explore digital gold-backed financial instruments to reduce storage burden.
- Strengthen domestic vault infrastructure to reduce dependency on foreign storage.

# Cryptocurrency Trading Compared to Hawala System by Supreme Court

## Why in News?

- The **Supreme Court of India** remarked that **cryptocurrency trading in India resembles a sophisticated form of the Hawala system.**
- Observation was made during a **bail hearing**, highlighting the **absence of a robust regulatory framework** for virtual currencies.

## About Cryptocurrency

- **Definition:** A digital currency based on **blockchain technology**, functioning without central authority.
- **Examples:** Bitcoin, Ethereum, etc.
- **Blockchain:** A decentralized, open-source **public ledger** of transactions distributed across computer networks.
- **Key Features:**
  - Not backed by a government or central bank (**non-fiat**).
  - **No intrinsic value;** value derived from demand and supply.
  - Transactions are **pseudonymous** and recorded permanently.

## About Hawala System

- **Definition:** An **informal method** of transferring money without physical movement of funds.
- **Operated by:** Middlemen known as **hawaladars**.
- **Key Features:**
  - Based on **mutual trust** among hawaladars.
  - Operates **outside the formal banking system.**
  - No official records; transactions are **cash-based** and paperless.

## *Nexus Between Cryptocurrency and Hawala*

| Aspect | Cryptocurrency | Hawala |
|---|---|---|
| **Regulation** | Unregulated digital ecosystem | Informal and unregulated channel |
| **Trust Mechanism** | Maintained by **consensus across nodes** | Based on **trust among hawaladars** |
| **Anonymity** | Transactions stored **anonymously** | No paper trail, entirely **offline** |
| **Tools Used** | Encrypted **private keys/passcodes** | Use of **shared codes/passphrases** |
| **Cost** | **Lower fees**, not bound by commissions | No currency exchange charges or formal fees |

## *Reasons Behind the Rising Nexus*

- **Lack of Oversight:** Both systems operate **outside traditional banking and regulatory mechanisms.**
- **Cost Advantage: Lower transaction costs** compared to formal financial systems.
- **Opacity:**

  Cryptocurrencies use encrypted systems with **public yet anonymous ledgers.**

  Hawala relies on cash and **off-the-record settlements.**
- **Security Tools:** Cryptos use **encryption keys,** while hawala uses **code-based identification** between parties.

## *Concerns and Challenges*

- **Risk of Illicit Transactions:** Used for **money laundering, terror financing,** and **tax**
- **Absence of Legal Clarity:** No dedicated law or **regulatory regime for cryptocurrencies** in India yet.
- **Monitoring Difficulties:** Hard to trace cross-border crypto transactions; similar to **hawala's invisibility.**

## *Way Forward*

- **Regulatory Framework:** India must establish a **comprehensive legal structure** for crypto transactions. Regulate **crypto exchanges** under financial compliance laws.
- **International Cooperation:** Strengthen global partnerships to monitor **cross-border crypto movements.**
- **Public Awareness:** Educate citizens about the **risks of unregulated digital currency use.**
- **Blockchain Utilization:** Leverage blockchain for **transparent government services** while preventing its misuse.

# UNDP Human Development Report 2025

## *Why in News?*

- **United Nations Development Programme (UNDP)** released the **Human Development Report (HDR) 2025**, titled 'A Matter of Choice: People and Possibilities in the Age of AI'.
- The report highlights **Artificial Intelligence (AI)** as a major force influencing human development.

## *India's Performance in Human Development*

- **HDI Ranking and Value**

  **HDI Rank (2025):** India moved up 3 places to rank **130 out of 193 countries.**

  **HDI Value:** Improved to **0.685**, placing India in the **medium human development category.**

- **Key Indicators**

  Life Expectancy: Reached **72 years** in 2023 – highest since the index began.

  **Education:**

  **Mean Years of Schooling:** Increased to **13 years**, up from **8.2 years in 1990.**

- **Persistent Challenges**

  **Gross National Income (GNI):** India's **GNI per capita rank** is **7 positions lower** than its HDI rank.

  **Gender Inequality:**

  India ranks **102nd** on the **Gender Inequality Index (GII).**

  Key concerns: **Reproductive health, political participation, workforce representation.**

## *Global Trends in Human Development*

- **Slowed Progress:** Global human development is advancing at its **slowest pace since 1990.**
- **Widening Gap:** Inequality between **low and very high HDI countries** has grown for the **fourth consecutive year.**

## *Highlights on Artificial Intelligence in 2025 HDR*

- **Global Outlook**

  **AI's Impact on Jobs:**

  **61%** of people expect AI to **augment human jobs.**

  **51%** believe it will **automate many jobs.**

## *Highlights on Artificial Intelligence in 2025 HDR*

### ➪ India's AI Landscape

**AI Skills Penetration:** India reports the **highest self-reported AI skill penetration globally.**

**Global AI Index:** India ranks **4th among 36 countries**, the **only lower-middle-income nation** in the top 10.

**Talent Retention: 20% of Indian AI researchers** now stay within the country, compared to almost zero in 2019.

## *Way Forward*

➪ **Address Gender Inequality:** Strengthen policies targeting **female participation** in education, healthcare, and employment.

➪ **Boost GNI Growth:** Invest in **inclusive economic growth** to align income levels with human development.

➪ **Leverage AI Responsibly:** Promote **ethical AI use,** inclusive access to AI education, and regulation to prevent job displacement.

➪ **Bridge Global Inequality:** Collaborate internationally to **reduce HDI disparities** through equitable tech and development aid.

## *Conclusion*

➪ India has made notable progress in **education and life expectancy**, and emerged as a strong player in the **global AI landscape.**

➪ However, addressing **income disparities** and **gender inequality** remains crucial to sustaining and enhancing human development.

# Operation Sindoor: India's Major Cross-Border Strike

## Why in News?

- India launched **Operation Sindoor** in response to the **Pahalgam terror attack,** marking the **largest cross-border strike** on terrorist infrastructure since the 2019 Balakot airstrike.
- India invoked its right to **pre-empt, deter, and respond** to terror threats.

## About Operation Sindoor

- **Nature:** Targeted **terrorist infrastructure** in **Pakistan** and **Pakistan-occupied Kashmir (PoK).**
- **Type of Offensive:** Measured, **calibrated, and non-escalatory.**
- **Technology Used:** Indian forces deployed **precision-strike weaponry** using niche technology.
- **Pakistan's Response:** Claimed right to retaliate under **Article 51 of the UN Charter.**

## Precision Strike Capabilities Used by India

- **SCALP (Storm Shadow) Missile**
  - Air-launched, long-range (450 km) cruise missile.
  - Designed for deep-strike on high-value targets.
- **HAMMER Munition**
  - Highly Agile Modular Munition Extended Range.
  - Precision-guided, stand-off weapon (50–70 km range).
- **Loitering Munitions (Kamikaze Drones)**
  - Drones hover and autonomously or remotely identify and destroy targets.
- **METEOR Missile**
  - Beyond Visual Range Air-to-Air Missile (BVRAAM).
  - Effective even in dense electronic warfare environments.
- **BRAHMOS Missile**
  - Supersonic cruise missile operating on the **'Fire and Forget' principle.**
  - Capable of diverse flight paths and high accuracy.

- ***Legal Justification: Article 51 of the UN Charter***
  - ➪ Upholds **inherent right to individual or collective self-defence** if a UN member is attacked.
  - ➪ Requires that defensive actions be **reported to the UN Security Council.**
  - ➪ Encourages measures that maintain **international peace and security.**

- ***Way Forward***
  - ➪ Maintain **deterrence posture** against future cross-border threats.
  - ➪ Enhance **surveillance and intelligence** capabilities.
  - ➪ Build **global diplomatic support** through transparency and compliance with international law.
  - ➪ Strengthen **strategic defence alliances** and internal counter-terrorism infrastructure.

# India's Air Defence System

## Why in News?

- India's Air Defence System (ADS) successfully neutralized aerial threats on the western border.
- This demonstrates India's growing self-reliance and technological sophistication in national security.

## About India's Air Defence System (ADS)

- ADS is an integrated network of radar, missile systems, and communication infrastructure designed to detect, track, and intercept aerial threats such as drones, aircraft, and missiles.

## Key Components of the Air Defence System

- **S-400 Triumf (Imported from Russia)**

  Also called **Sudarshan Chakra** in India.

  One of the world's most advanced long-range Surface-to-Air Missile (SAM) systems.

  **Features:**

  **360-degree radar** and **missile coverage.**

  **Multi-target engagement** capability.

  Integrated with **command and control system,** phased array radars, and electronic warfare countermeasures.

  **Range:**

  Tracking: **Up to 600 km**

  Engagement: **Up to 400 km**

  Altitude: **30 meters to 30 km**

- **Barak 8 (Jointly Developed by India and Israel)**

  **Medium to Long Range SAM** (MR-SAM/LR-SAM).

  Capable of engaging multiple air threats at **Mach 2 speed.**

  Exists in both **maritime** and **land-based variants.**

  Range: **Up to 100 km**

- ***Key Components of the Air Defence System***
  - **Akash Weapon System (Indigenously Built)**
    - **Short-Range** SAM.
    - Equipped with **Electronic Counter-Counter Measures (ECCM).**
    - **Fully automatic** with fast response from detection to kill.
    - **Capabilities:**
      - Range: **4.5 km to 25 km**
      - Altitude: **100 m to 20 km**
      - High resistance to jamming
      - **Multi-target engagement** (group or autonomous mode)
      - Command guidance system

- ***Structure of India's Air Defence System***
  - **Detection:** Use of radar systems to spot aerial threats.
  - **Tracking:** Real-time monitoring of threat movement.
  - **Interception:** Neutralization using missile systems like S-400, Barak 8, and Akash.
  - **Command, Control & Communication (C3) System:** Integrates detection, tracking, and interception components for coordinated operations.

- ***Way Forward***
  - Continued modernization and indigenous development of ADS components.
  - Expansion of networked integration with space-based and AI-driven tracking systems.
  - Strengthening drone defense through counter-UAS grids.

# First Pangenome of Asian Rice by Chinese Scientists

## Why in News?

- Chinese scientists have developed the **first-ever Pangenome of Asian rice** using **PacBio high-fidelity (HiFi) sequencing technology.**
- It is built from **144 varieties** of wild and cultivated rice in Asia.
- The study supports the theory that all cultivated Asian rice originated from a **wild variety called Or-IIIa,** a variant of Oryza rufipogon.

## What is a Pangenome?

- A **Pangenome** is a **collection of genome sequences** from multiple individuals of the same species.
- It includes both **common genes** and **unique genes** across varieties, unlike reference genomes which include only standard genes.
- Acts as a **comprehensive reference genome**, reflecting **genetic diversity** within a species.

## About Asian Rice and its Evolution

- **Scientific Name:** Oryza sativa L.
- **Domestication:** Cultivated from the wild progenitor **Oryza rufipogon.**
- **Or-IIIa,** a variant of O. rufipogon, is now confirmed as the **evolutionary origin** of all Asian cultivated rice.

## HiFi Sequencing Technology

- **HiFi (High-Fidelity) Sequencing:** A **Single Molecule Real-Time (SMRT)** sequencing method.
- Offers **long-read and high-accuracy** genome sequencing.
- Enables better assembly of complex regions of DNA compared to short-read methods.
- Falls under **long-read sequencing technologies,** essential for constructing accurate pangenomes.

## *Applications of the Pangenome*

### In Agriculture

Enables identification of **new traits** for **disease tolerance** and **climate resilience** in crops.

Helps in utilizing **wild genetic resources** to develop **superior crop varieties** with better productivity.

### In Precision Medicine

Supports creation of **population-specific medical treatments** by identifying **unique genetic markers.**

Example: The **Human Pangenome Project** helps trace genetic causes of diseases for specific populations.

## *Way Forward*

- **Crop Improvement:** Use pangenome data to **enhance yield and resilience** in rice and other staples.
- **Biodiversity Conservation:** Protect **wild rice varieties** as reservoirs of valuable genes.
- **Technology Adoption:** Promote **HiFi sequencing** in genomic research across countries.
- **Global Collaboration:** Share genomic data for building **integrated crop development frameworks** globally.

## *Conclusion*

The creation of the **Asian rice pangenome** marks a major advancement in agricultural genomics, offering pathways to enhance **food security**, support **climate-resilient agriculture,** and deepen **evolutionary understanding** of crop species.

# Conscription via Territorial Army Empowered

## Why in News?

- The Central Government has empowered the **Chief of Army Staff (COAS)** to summon personnel of the **Territorial Army (TA)** under **Rule 33 of the Territorial Army Rules, 1948.**
- This move is seen as a significant step towards enabling **conscription-based military support** in times of national need.

## What is Conscription?

- **Conscription** refers to the **mandatory enlistment** of civilians into the armed forces during emergencies or wartime.
- It is also called **compulsory military service** or **drafting.**
- Unlike volunteer-based recruitment, conscription is enforced by law to meet urgent manpower needs in national defence.

## India's Evolving Conscription Framework

- India has traditionally relied on **voluntary military service.**
- However, recent steps — like empowering COAS to call on **Territorial Army** volunteers — create a **legal and institutional pathway** for **partial or limited conscription** during crises.
- Though still **not full conscription,** this mechanism **mirrors a conscription model** by enabling mobilisation of trained civilians for defence roles.

## Role of Territorial Army in Conscription Framework

- The **Territorial Army (TA)** acts as a **reserve force,** and its members are civilians who can be called upon to serve when required.
- With this new empowerment, the **COAS can conscript TA personnel** without prior approval from the Central Government.
- This allows **faster deployment** of manpower during war, internal disturbances, or disasters.

- ***Key Features of Territorial Army***
  - **Part of the Regular Army,** functioning as a **second line of defence.**
  - Members are known as **Terriers**.
  - Called upon for:
    - Supporting civil administration.
    - Maintaining essential services.
    - Relieving regular troops from non-combat duties.

- ***Eligibility for TA (Conscription Pool)***
  - Indian citizenship.
  - Graduate degree from a recognised university.
  - Gainfully employed (exceptions exist for ex-servicemen).

- ***Historical Role of TA (Precedent for Conscription)***
  - TA personnel were mobilised during:
    - **1962, 1965, and 1971 wars.**
    - **Operation Pawan** in Sri Lanka.
    - **Operation Rakshak** in Punjab and J&K.
  - These instances reflect the **utility of a ready civilian force** in wartime scenarios — **core to the concept of conscription.**

- ***Evolution of TA and Legal Basis***
  - **1917:** Indian Defence Force Act introduced forced military service for the first time.
  - **1920:** Indian Territorial Force created.
  - **1948:** Post-independence, **Territorial Army Act** passed.
  - **1949:** TA formally inaugurated by **C. Rajagopalachari.**
  - **2025:** Empowerment of COAS under Rule 33 represents a **revival of conscription-like authority.**

- ***Implications of the Move***
  - **Establishes precedent for controlled conscription** without invoking a formal nationwide draft.
  - Enhances India's ability to respond swiftly during conflicts or large-scale emergencies.
  - Supports India's military preparedness in the face of **regional tensions and internal threats.**

- ***Way Forward***
  - Government may consider creating **structured conscription frameworks** through the TA model.
  - Policy refinement may include:
    - Categorisation of essential civilian professions.
    - Duration and conditions for compulsory service.
    - Legal safeguards and service incentives..

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