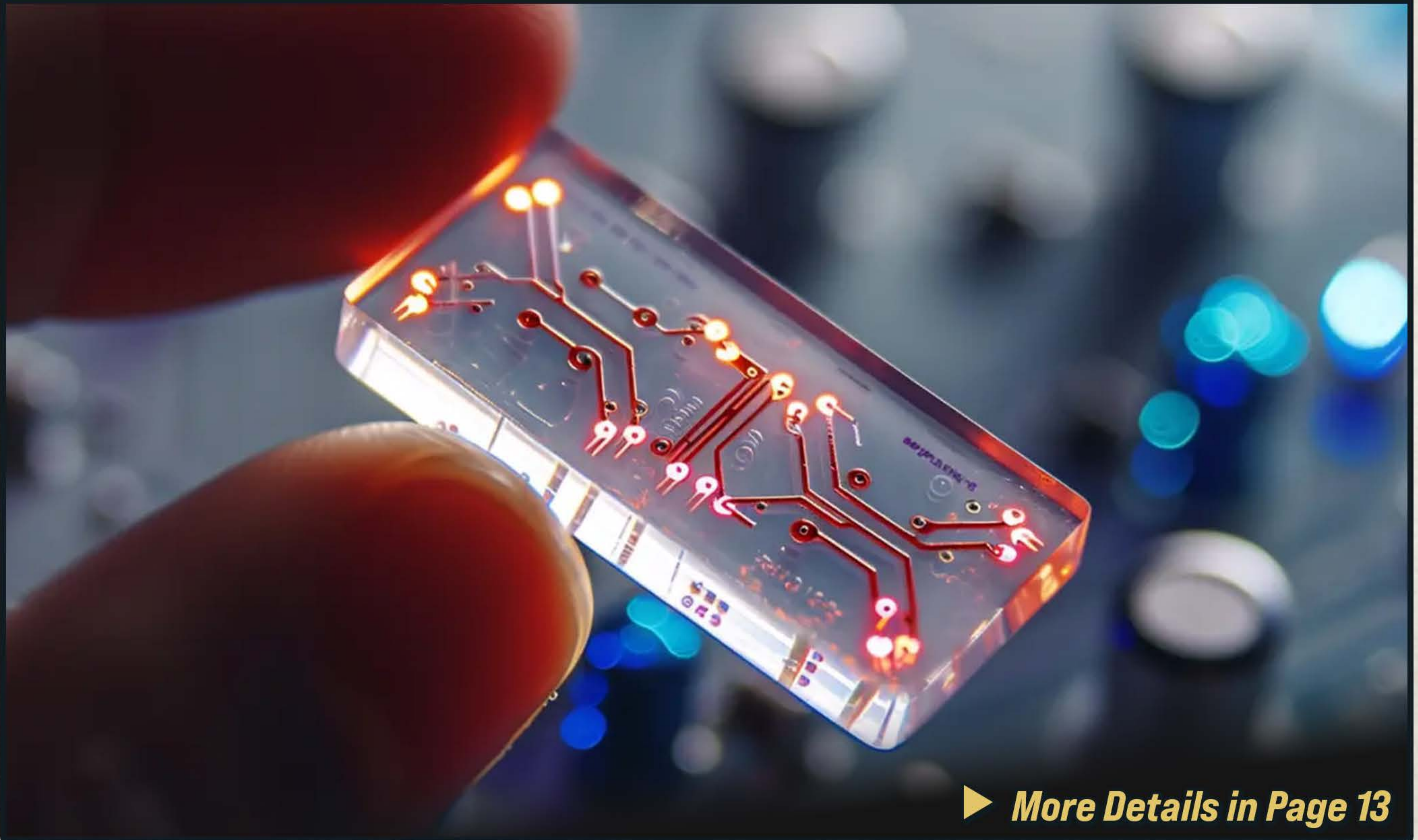# WEEKLY NEWS

Organs-on-Chips (OoCs) Technology

▶ **More Details in Page 13**

India's First CO2-to-Methanol Pilot Plant

▶ **More Details in Page 17**

HIGHLIGHTS

- Bharatiya Anthariksh Station (BAS)
- CRCAP 2070

20th MSDC Concludes in Goa

● *Why in News?*

➡️ The 20th MSDC meeting in Goa addressed key maritime challenges and launched significant initiatives aimed at boosting India's maritime sector, enhancing seafarer conditions, and improving port security.

● *Key Challenges Addressed*

➡️ **Places of Refuge for Distressed Ships:** Discussed the need for designated safe zones for ships in distress.

➡️ **Port Security Enhancements:** Focus on developing radioactive detection equipment to enhance port safety.

➡️ **Improving Seafarer Conditions:** Advocated for recognizing seafarers as essential workers, promoting better working conditions.

● *Key Initiatives Launched*

➡️ **Indian Maritime Centre (Policy Think Tank):** A platform to unite stakeholders, foster innovation, and drive strategic planning for maritime sector growth.

➡️ **Indian International Maritime Dispute Resolution Centre:** Established to position India as a global hub for maritime arbitration, aligning with the "Resolve in India" initiative.

➡️ **National Safety in Ports Committee Application:** Launched on the National Single Window System platform to streamline regulatory processes and enhance business efficiency in maritime operations.

● *Showcased State-Led Innovations*

➡️ **Kerala:** Monetization techniques for dredging.

➡️ **Gujarat:** Port-driven urban development projects.

➡️ **Construction of India's Largest Dredger:** Began at Cochin Shipyard Limited in collaboration with Royal IHC Holland.

➡️ **Mega Shipbuilding Park Plan:** Proposed to consolidate shipbuilding capabilities across regions.

● *State Ranking Framework*

➡️ **Objective:** Promote healthy competition, encourage performance enhancement, and foster sustainable practices among coastal states.

About MSDC

- **Formation:** Established in 1997 under the Ministry of Ports, Shipping, and Waterways.
- **Mandate:** Ensure integrated development of major and non-major ports in collaboration with state governments.
- **Leadership:** Chaired by the Union Minister of Ports, Shipping, and Waterways.
- **Frequency of Meetings:** MSDC is required to meet at least once every six months.

Way Forward

- **Strategic Focus:** Continued innovation, knowledge sharing, and policy alignment to foster the sustainable development of India's maritime sector.
- **Enhanced Efficiency:** Strengthen state-level participation, improve port infrastructure, and expand India's role as a global leader in maritime dispute resolution and shipbuilding.
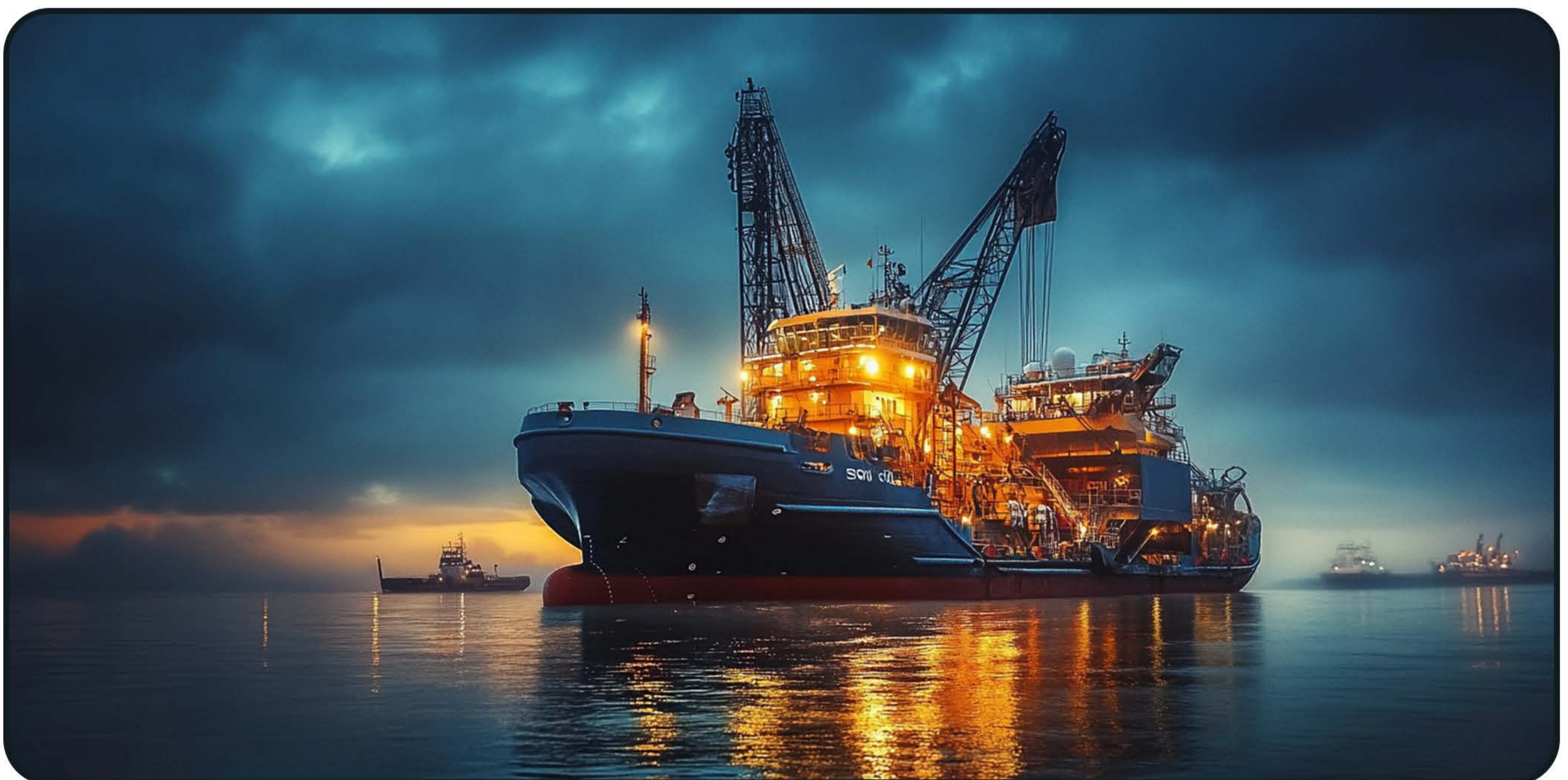
Global Cybersecurity Index (GCI) 2024

● *Why in News?*

⟹ The **International Telecommunication Union (ITU)** has released the **Global Cybersecurity Index (GCI) 2024.**

⟹ GCI 2024 evaluates country-level cybersecurity commitments using a five-pillar approach across legal, technical, organizational, capacity development, and cooperation dimensions.

● *Key Highlights*

⟹ **India among Role Model Countries:** India is among 46 countries in Tier 1, designated as "role model" nations demonstrating strong commitments across all five cybersecurity pillars.

⟹ **Global Cybersecurity Progress:** Since the last GCI report in 2021, significant improvements in cybersecurity have been observed across all regions, with Africa making the most progress.

⟹ **Digital Services Expansion:** Many countries, categorized under Tier 3 (establishing) or Tier 4 (evolving), have expanded digital services but still need to integrate comprehensive cybersecurity measures.

● *Key Issues*

⟹ **Ransomware and Cyber Threats:** Persistent issues such as ransomware attacks, breaches affecting core industries, and costly system outages remain significant concerns.

⟹ **Cyber-capacity Gap:** Countries face limitations in skills, staffing, equipment, and funding needed to strengthen their cybersecurity frameworks.

⟹ **Operational Challenges:** Implementing cybersecurity frameworks and agreements into practical operation continues to be a challenge globally.

● *Key Recommendations*

⟹ **National Cybersecurity Strategy:** Countries should develop and continuously update comprehensive national cybersecurity strategies.

⟹ **Capacity Building:** Invest in building the capacity of cybersecurity professionals, with a focus on youth and vulnerable groups.

⟹ **International Cooperation:** Promote both domestic and international cooperation through information sharing, training opportunities, and collaborative cybersecurity initiatives.

Way Forward

➡️ Countries should prioritize the integration of cybersecurity in their digital transformation plans and enhance international cooperation to tackle emerging global cyber threats.

About the International Telecommunication Union (ITU)

- Headquarters: Geneva, Switzerland.

- Established: ITU was founded on 17 May 1865 with the signing of the first International Telegraph Convention in Paris.

- Role: ITU is the UN's specialized agency for digital technology, aiming to harness innovation and connect people for a better future.

- Members: 193 Member States, including India, along with companies, universities, and research bodies.

- Flagship Reports: ITU publishes the Global Connectivity Report and the Global e-Waste Monitor, among others.

WHO Prequalifies First Vaccine Against Mpox

Why in News?

⇒ The World Health Organization (WHO) has prequalified the first vaccine for Mpox, the MVA-BN vaccine, developed by Bavarian Nordic. This marks a significant step toward better protection against the zoonotic disease.

Key Details of the Vaccine

⇒ **Vaccine Developer:** Bavarian Nordic, a Danish pharmaceutical company.

⇒ **Eligibility:** Approved for individuals aged 18 and above.

⇒ **Effectiveness:**

Single dose: 76% effectiveness before exposure.

Double dose: 82% effectiveness before exposure.

⇒ **Previous Approvals:** The vaccine has already been approved in Europe and the US.

About WHO Vaccine Prequalification (PQ)

⇒ **Genesis:** Established in 1987 to ensure the quality of vaccines distributed by UN agencies.

⇒ **WHO List of Prequalified Vaccines:** Includes vaccines that meet quality and safety standards after thorough evaluation and testing.

⇒ **Note on Approval:** Prequalification by WHO does not equate to formal approval, which is handled by National Regulatory Authorities (NRAs).

⇒ **Significance:**

Accelerates vaccine procurement for governments and international agencies like GAVI and UNICEF.

Facilitates fast-track approvals by NRAs.

Supports WHO's Expanded Programme on Immunization to ensure universal vaccine access.

About Mpox

- **Pathogen:** Monkeypox virus (MPXV), a double-stranded DNA virus of the Orthopoxvirus genus.
- **Transmission:** Occurs through close contact with an infected person or animal, as well as from mother to fetus during pregnancy.
- **Symptoms:** Includes skin rashes or mucosal lesions, along with fever, headache, and swollen lymph nodes.
- **Global Response:**

    First discovered in 1958 in research monkeys in Denmark.

    WHO declared Mpox a public health emergency of international concern in 2022 and 2024.

Way Forward

- **Global Immunization Efforts:** The prequalification of MVA-BN vaccine will accelerate efforts to control Mpox outbreaks.
- **Increased Access:** Countries can now fast-track the procurement of this vaccine, ensuring vulnerable populations have better access to prevention measures.
- **Continued Research:** Ongoing research and surveillance are needed to improve understanding and response to Mpox globally.

National Jute Board

Why in News?

➡️ National Jute Board predicts a 20% drop in jute production for FY 2024-25 due to flood damage in **West Bengal** and **Assam**, the primary jute-producing states.

About the Jute Industry

➡️ **India** leads globally in jute goods production, contributing **70%** of global output.

➡️ The industry is vital to the **eastern region**, particularly in **West Bengal**, which accounts for **73%** of production.

➡️ **90%** of jute produced is consumed domestically.

Opportunities

➡️ Provides direct employment to **0.37 million workers** in organized mills.

➡️ The industry's **export potential** is expected to grow from **₹3000 crore (2023-24)** to **₹4500 crore** annually.

Challenges

➡️ **Declining cultivation area:** Jute farming land shrank by 1.7 lakh hectares from 2013-14 to 2021-22.

➡️ **Low-cost alternatives:** Synthetic products are more competitive.

➡️ **No Support:** Lack of support for jute products like jute geo-textiles from states.

➡️ **Poor quality:** Over 80% of raw jute is below average quality.

➡️ **Other issues:** Lack of modernization, shortage of skilled labor, etc.

Measures Suggested

➡️ Develop a **comprehensive policy** for setting up new jute mills.

➡️ Launch schemes to address the **skilled labor shortage** in the jute industry.

Initiatives Taken

⇨ **National Jute Board (NJB):** Formed under the **National Jute Board Act, 2008,** to promote jute cultivation, manufacturing, and marketing.

⇨ **National Jute Development Programme:** An umbrella scheme for the industry's development.

⇨ **Production Linked Incentive (PLI)** scheme.

⇨ Establishment of **Jute Corporation of India (JCI).**

⇨ **Jute Packaging Materials Act, 1987:** Mandates the use of jute for packaging.

⇨ Other initiatives: **Jute Mark Logo, Improved Cultivation and Advanced Retting Exercise (Jute ICARE) Scheme,** etc.

Way Forward

⇨ Focus on **modernization** and improve the quality of raw jute.

⇨ Encourage the use of **jute products** in states and promote exports.

⇨ Address the **shortage of skilled workers** through targeted training programs.

Neuromorphic Computing

● Why in News?

⇨ **Indian Institute of Science (IISc) scientists** reported a major breakthrough in neuromorphic computing.

⇨ They developed **Memristor semiconductor devices** using **metal-organic films**, which offer an alternative to traditional silicon-based technology.

● Key Highlights of the Development

⇨ **Memristor Devices:**

These devices mimic the way the **biological brain processes information**, using networks of **neurons and synapses.**

The use of **metal-organic films** enhances the ability to replicate brain-like computing.

● What is Neuromorphic Computing?

⇨ **Neuromorphic Computing:**

Mimics the **structure and function** of the human brain.

Involves designing hardware and software that simulate **neural networks** and **synapses** to process information.

⇨ **How It Works:**

Utilizes hardware like **spiking neural networks (SNNs)**, consisting of nodes (spiking neurons) connected by artificial synapses.

Data is encoded through **analog signal changes,** unlike binary systems used in traditional computers.

● Benefits of Neuromorphic Computing

⇨ **Adaptability:** Can quickly adapt to new stimuli, excelling at solving **real-time problems.**

⇨ **Event-driven Computation:** Only active parts consume energy, ensuring **efficient power usage.**

⇨ **High Performance:** Integrates **memory and processing** in neurons, reducing latency.

⇨ **Parallel Processing:** Processes multiple tasks across different neurons simultaneously for **faster operation.**

Challenges of Neuromorphic Computing

⇨ **Lack of Standards:** Absence of **benchmarks** and standards for development.

⇨ **Limited Accessibility:** Difficulties in accessing suitable software and hardware.

⇨ **Decreased Accuracy:** Current technology may lack the precision of conventional computing systems.

Brain's Information Processing

⇨ **Neurons:** The basic units of the brain and nervous system, responsible for **relaying information** between different parts of the brain and body.

⇨ **Synapses:** The network of connection points through which neurons communicate via **chemical and electrical signals.**

Way Forward

⇨ **Standardization:** Establishing benchmarks and standards for neuromorphic computing.

⇨ **Technology Development:** Advancing software and hardware accessibility for wider adoption.

⇨ **Research Expansion:** Encouraging further research to enhance accuracy and performance in real-world applications.
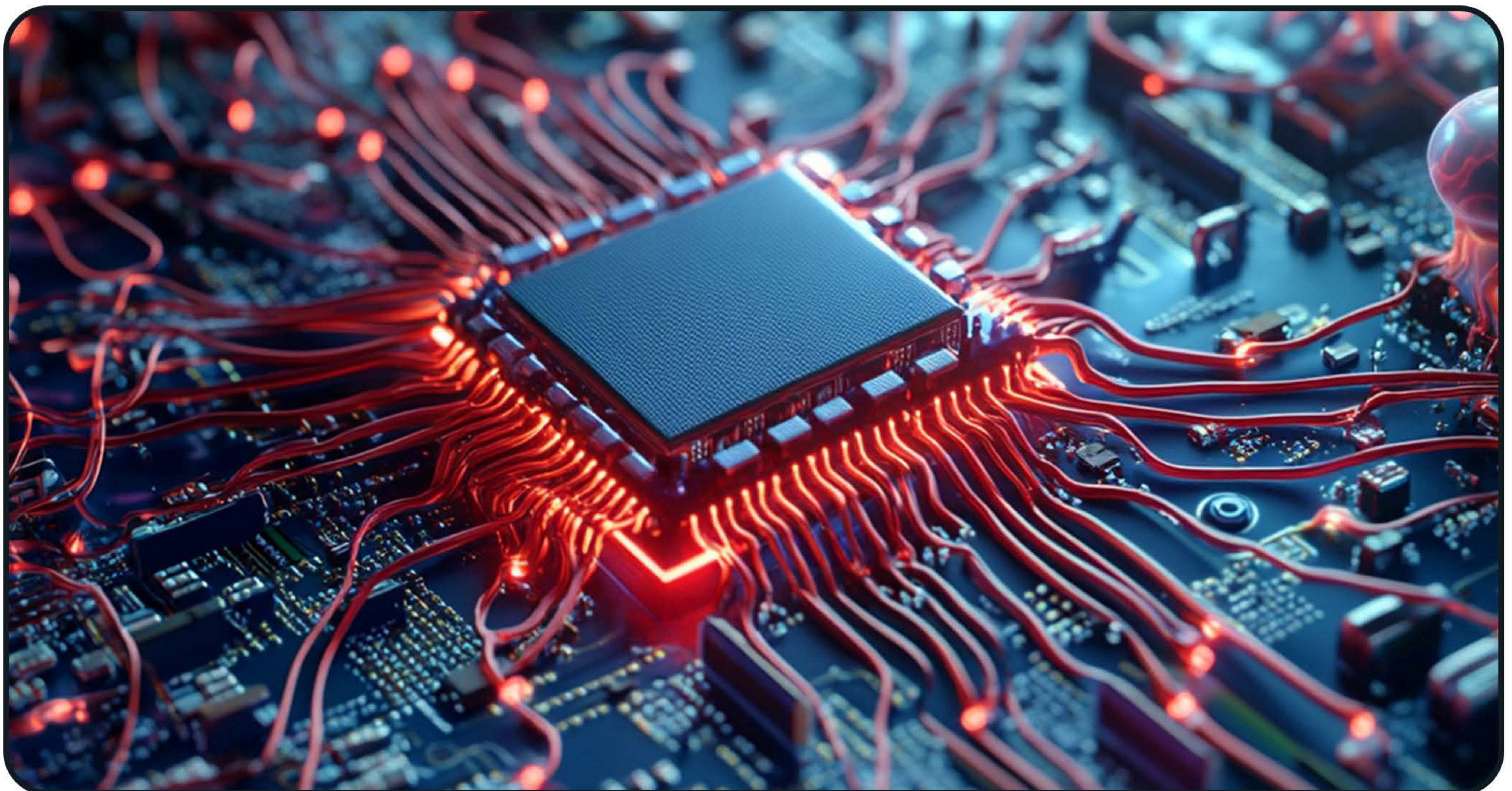
Conference on International Arbitration and Rule of Law

● **Why in News?**

➡ The Supreme Court of India, along with the **Permanent Court of Arbitration (PCA)** and the **United Nations Commission on International Trade Law (UNCITRAL)**, organized a **Conference on International Arbitration and Rule of Law** in **New Delhi**.

➡ The event commemorates the **75th anniversary** of the **Supreme Court of India** and the **125th anniversary of the PCA.**

● **About Arbitration**

➡ **Definition:** Arbitration is a form of Alternative Dispute Resolution (ADR), where parties submit their dispute to one or more arbitrators who make a binding decision. Other forms of ADR include mediation, conciliation, and negotiations.
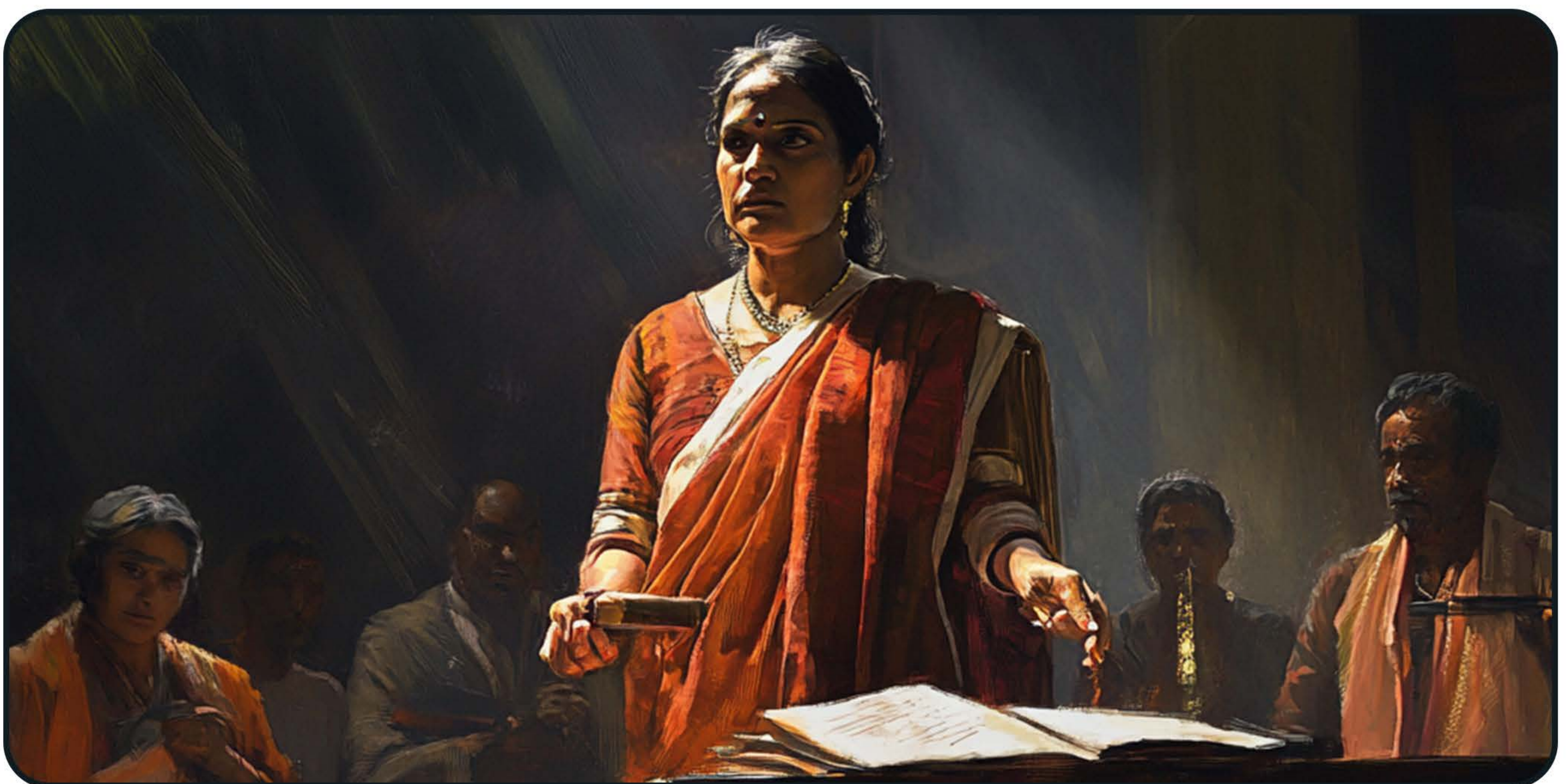
➡ **Key Characteristics of Arbitration**

Neutrality

Confidentiality

Consensual with binding decisions

Flexible and faster compared to litigation

Existing Frameworks on Arbitration

➡️ **Domestic Frameworks**

Arbitration and Conciliation Act, 1996: Based on the UNCITRAL Model Law, this act applies to all kinds of arbitration, including commercial disputes.

New Delhi International Arbitration Centre Act, 2019: Facilitates institutional arbitration in India, promoting India as a hub for international arbitration.

Indian Council of Arbitration (ICA): A society registered under the Societies Registration Act, 1860, to promote arbitration.

➡️ **Global Frameworks**

International Court of Arbitration (ICA): Established in 1923 by the International Chamber of Commerce to facilitate international commercial arbitration.

Permanent Court of Arbitration (PCA): Founded in 1899 by the Convention for the Pacific Settlement of International Disputes, located in The Hague. India is a party to this convention.

UNCITRAL Model Law: Provides the legal framework for international commercial mediation and settlement agreements.

Rule of Law and Arbitration

➡️ **Definition (A.V. Dicey):** Rule of law refers to the absolute supremacy of regular law over arbitrary governmental power, ensuring fairness and equality before the law.

➡️ **Significance of Rule of Law in Arbitration**

Promotes Stability and Predictability: A solid legal foundation encourages fair and transparent dispute resolution, enhancing confidence in the arbitration process.

Protection of Rights: Ensures the enforcement of contracts and amicable dispute resolution while safeguarding the rights of all parties involved.

Way Forward

➡️ **Strengthening Legal Framework:** Continued efforts to improve domestic and international arbitration laws, promoting India as a global arbitration hub.

➡️ **Capacity Building:** Enhancing the capacity of legal professionals, arbitrators, and institutions to handle complex arbitration cases efficiently.

➡️ **Collaboration with Global Institutions:** Expanding partnerships with international organizations like PCA and UNCITRAL to align Indian arbitration practices with global standards.

Organs-on-Chips (OoCs) Technology

Why in News?

➡️ Recent advancements in human-relevant 3D culture models, including Organs-on-Chips (OoCs), enhance disease modeling, drug development, and personalized medicine.

What is OoCs Technology?

➡️ **Definition:** Utilizes tiny fluid channels to simulate biological processes such as blood flow, oxygen delivery, and nutrient transport, creating miniature organ models (e.g., lungs, hearts) on chip-sized devices.

➡️ **Composition:** Made from living cells grown in a flexible material.

Advantages of OoCs Technologies

➡️ **Reduced Animal Testing:** Can replace animal testing in certain cases.

➡️ **Enhanced Accuracy:** Provides more precise biological responses compared to traditional 2D cell cultures.

Applications of OoCs Technologies

➡️ **Drug Discovery:** Assess drug efficacy and screen new drugs.

Precision Medicine: Develop personalized treatments tailored to individual patients.

➡️ **Disease Mechanisms:** Investigate disease processes and identify potential therapeutic targets.

➡️ **Cell-Cell Interactions:** Study how cells interact and respond to their environment.

Challenges Associated with OoC Technology

➡️ **Standardization:** Need for uniform manufacturing processes.

➡️ **Lack of Protocols:** Absence of universally accepted protocols and materials.

➡️ **Complexity Replication:** Difficulty in mimicking the full complexity of human organs.

Steps Taken for Promoting OoCs

➡️ **Amendment of New Drugs and Clinical Trials Rules 2019:** Permits the use of OoCs and other New Approach Methods (NAMs) in drug evaluation before and alongside animal testing.

➡️ **BioE3 Policy:** Aims to drive innovation in the biotechnology sector, with a key focus on precision therapeutics.

Addressing Subtle Gender Discrimination in Society

● **Why in News?**

➡️ The Vice-President has highlighted the need to focus on pervasive, subtle forms of gender discrimination that persist in society.

● **Understanding Subtle Gender Discrimination**

➡️ **Evolving Forms:** While overt gender discrimination appears to have decreased, it has shifted to more subtle expressions.

➡️ **Manifestations:** These subtle forms can undermine women's capabilities and reinforce traditional gender roles through seemingly supportive attitudes and behaviors.

● **Examples of Subtle Gender Discrimination**

➡️ **Reinforcing Stereotypes:** Compliments that praise women's multitasking abilities can inadvertently reinforce traditional roles.

➡️ **Hiring Bias:** Unconscious biases favoring male candidates for positions perceived as needing physical strength or leadership.

➡️ **Microaggressions:** Small comments that perpetuate stereotypes, such as suggesting women are less committed due to family obligations.

➡️ **Work-Life Balance Assumptions:** Societal expectations regarding caregiving can disproportionately impact women's career advancement.

● **Strategies for Addressing Subtle Gender Discrimination**

➡️ **Blind Evaluation:** Implementing practices that hide applicants' physical attributes to focus on qualifications.

➡️ **Cultivating Inclusivity:** Fostering a workplace environment that values input from all individuals, regardless of gender.

➡️ **Assessing Unconscious Bias:** Utilizing methods like perception surveys and language analysis to identify and address gender bias in the workplace.

➡️ **Changing Mindsets:** Promoting gender sensitization to alter male perceptions and attitudes.

● *Steps Taken for Curbing Gender Discrimination*

➡ **Equal Remuneration Act of 1976:** Aimed at reducing wage gaps between genders.

➡ **Beti Bachao Beti Padhao Scheme:** Focuses on educating citizens against gender bias and enhancing welfare services.

➡ **Prime Minister's Employment Generation Programme (PMEGP):** Assists women in starting their own enterprises.

➡ **Mission Shakti:** An umbrella scheme dedicated to the safety, security, and empowerment of women.
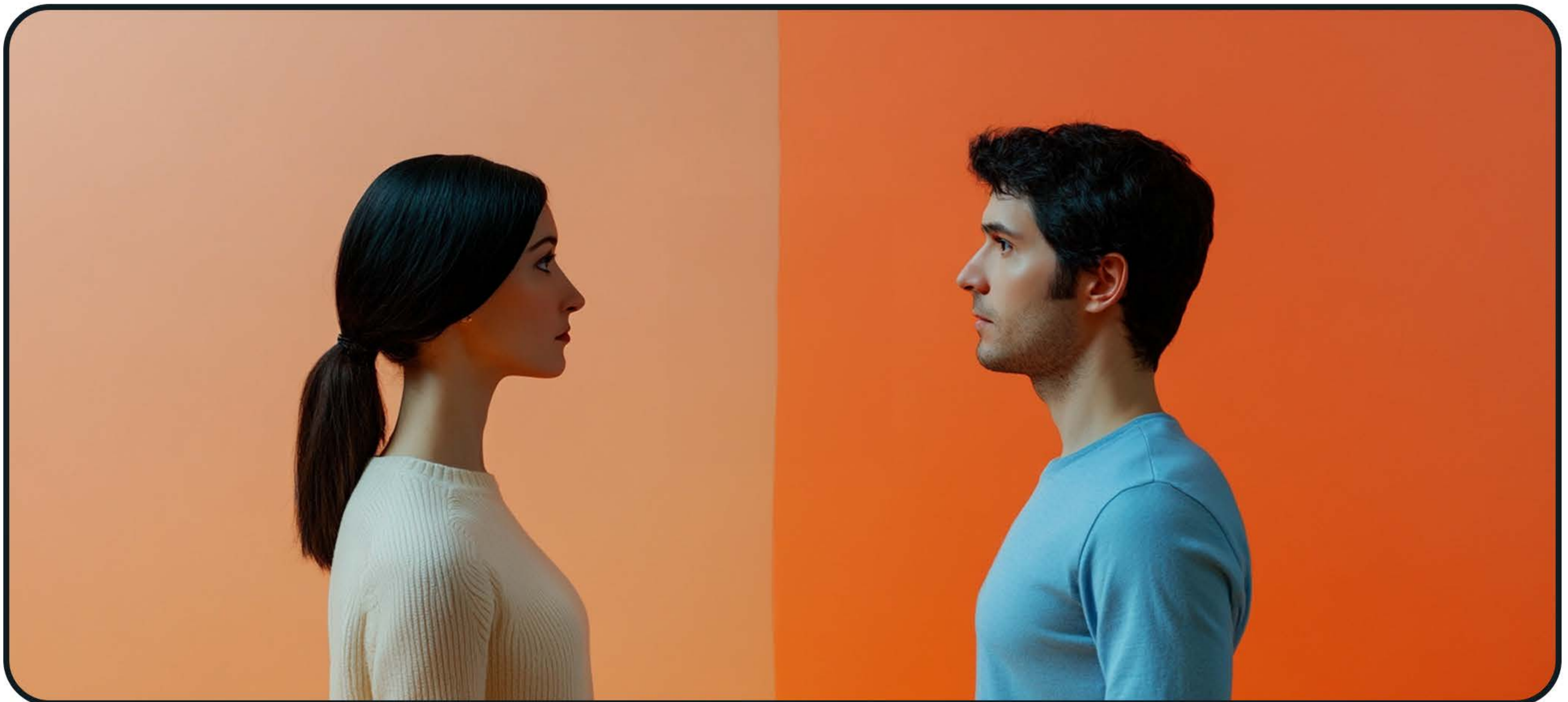
Battery Waste Management

Why in News?

⇨ **Central Pollution Control Board (CPCB)** has issued guidelines under the **Battery Waste Management Rules, 2022.**

⇨ Aimed at promoting sustainable battery waste management and ensuring compliance across the country.

What is Environmental Compensation (EC)?

⇨ **Definition:** EC is a financial penalty imposed on producers and entities involved in battery refurbishment and recycling for non-compliance with the rules.

⇨ **Legal Basis:** Enforced by the CPCB under the **"Polluter Pays Principle."**

⇨ **Non-compliance Issues:** Entities providing false information, operating without registration, or failing to meet Extended Producer Responsibility (EPR) targets will be penalized.

Extended Producer Responsibility (EPR)

⇨ **Meaning:** Responsibility of producers to manage waste batteries in an environmentally sound manner.

⇨ **Carrying Forward Obligations:** Unfulfilled EPR targets for a year will be carried forward to the next year.

⇨ **Payment of EC:** Does not absolve producers from fulfilling their EPR obligations.

Key Highlights of the Guidelines

⇨ **EC Regime 1:** Penalties for producers based on metal-wise EPR target non-fulfillment (Lead Acid, Lithium-ion, etc.).

⇨ **EC Regime 2:** Penalties for any entity violating Battery Waste Management (BWM) Rules, 2022, based on application fees.

Way Forward

⇨ **BWM Rules:** Producers and recycling entities need to ensure compliance with BWM Rules to avoid financial penalties.

⇨ **Disposal and Recycling:** Focus on promoting environmentally sound battery disposal and recycling practices.

India's First CO2-to-Methanol Pilot Plant

- **Why in News?**
  - A pilot plant for converting CO_2 to methanol is proposed in Pune, Maharashtra, with a capacity of 1.4 tons per day. This initiative is being developed under a Public-Private Partnership and supported by the Department of Science and Technology.

- **About CO2-to-Methanol Conversion**
  - **Current State:** Carbon Utilization Technologies, like converting CO_2 to methanol, are less developed than carbon capture technologies.
  - **Process:**

    Capturing carbon emissions before they enter the atmosphere from industrial sources (e.g., power plants).

    The captured CO_2 is hydrogenated—reacted with hydrogen—to produce methanol.
  - **Benefits:** This conversion process can help reduce greenhouse gas emissions and provide a sustainable fuel source.

- **Significance of the Pune Plant**
  - **Advancement of Technologies:** The plant will enhance indigenous Carbon Capture and Utilization (CCU) technologies, contributing to India's Panchamrit declaration.

- **About Carbon Capture, Utilization, and Storage (CCUS)**
  - **Definition:** CCUS encompasses technologies that capture CO_2 from large stationary sources, such as fossil fuel-based power plants.
  - **Process:**

    Transporting captured CO_2 (via pipelines, shipping, or trucks) for utilization in various applications.

    Injecting CO_2 into geological formations or depleted oil/gas fields for permanent storage.

Importance of CCUS

- **Decarbonization:** Key for hard-to-abate sectors like cement and steel that heavily rely on fossil fuels.

- **Promotion of Low-Carbon Hydrogen:** Facilitating coal gasification with CCUS technologies.

- **Achieving Net Zero Targets:** Enhancements in Direct Air Capture technology play a crucial role.

Challenges in CCUS Adoption in India

- **Cost Variability:** Carbon capture costs vary significantly across sectors, depending on the source and concentration of CO2.

- **Limited Storage Capacity:** Challenges exist, especially for saline aquifers and basaltic storage, due to insufficient geological data on pore space availability.

- **Infrastructure Gaps:** A lack of downstream CO2 infrastructure for transportation and storage hinders effective implementation.

Pradhan Mantri Janjatiya Unnat Gram Abhiyan (PM-JUGA)

● **Why in News?**

⇒ The Union Cabinet has approved the **Pradhan Mantri Janjatiya Unnat Gram Abhiyan (PM-JUGA)**, inspired by the success of **PM-JANMAN.**

⇒ Aims to improve the socio-economic conditions of tribal communities through targeted interventions.

● **Key Highlights**

⇒ **Total Outlay:** Rs. 79,156 crores with Central Share of Rs. 56,333 crores.

⇒ **Coverage:** 63,000 villages across 549 districts in 30 States/UTs, benefiting over 5 crore tribal people.

⇒ **Implementation:** Involves 25 interventions executed by 17-line ministries under the Development Action Plan for Scheduled Tribes (DAPST) over the next five years.

⇒ **Monitoring:** Progress tracked via the PM Gati Shakti platform, promoting cooperative federalism.

● **Mission's Four Goals**

⇒ **Infrastructure Development:** Building pucca houses for tribal families and improving village infrastructure.

⇒ **Economic Empowerment:** Fostering skill development, entrepreneurship, and self-employment for sustainable livelihoods.

⇒ **Education Access:** Universalizing access to quality education.

⇒ **Health and Dignity:** Ensuring healthy lives and dignified aging for tribal communities.

Innovative Schemes under PM-JUGA

⇨ **Tribal Home Stay:** Promotes tribal tourism by establishing 1000 home stays under Swadesh Darshan.

⇨ **Sustainable Livelihood for Forest Right Holders (FRA):** Focus on securing forest rights for 22 lakh FRA patta holders.

⇨ **Education Infrastructure:** Enhancing facilities in government schools and hostels, modelled after PM-Shri Schools.

⇨ **Healthcare:** Advancing diagnostic facilities for sickle cell disease.

⇨ **Marketing Support:** Establishing Tribal Multipurpose Marketing Centres for promoting tribal products.

Way Forward

⇨ This initiative showcases a holistic approach to tribal development, ensuring that infrastructure, economic empowerment, education, and healthcare are improved in tribal-dominated regions. It emphasizes leveraging cooperative federalism to achieve saturation coverage and inclusive growth for the tribal population.

Bharatiya Anthariksh Station (BAS)

- ## *Why in News?*
  - The Union Cabinet has approved the development of **Bharatiya Anthariksh Station** (BAS) by expanding the scope of the Gaganyaan Programme. The first module, BAS-1, will be developed, with multiple missions to demonstrate and validate technologies required for building and operating the space station.

- ## *Revised Gaganyaan Programme*
  - **Original Approval:** The Gaganyaan Programme, approved in 2018, aims to send human spaceflights to Low Earth Orbit (LEO) and demonstrate long-duration human space mission technologies.
  - **Revised Goals:**

   ISRO will undertake four missions by 2026 under the Gaganyaan Programme.

    Four additional missions for demonstration and validation of technologies for BAS by December 2028.

    By 2035, additional modules will be constructed to achieve the full operational status of BAS.
  - **Current Status:** BAS is in the conceptualization phase, where elements like overall architecture, module types, and docking ports are being studied.

- ## *Significance of Bharatiya Anthariksh Station*
  - **Amrit Kaal Vision:** Aligns with India's vision for BAS by 2035 and an Indian Crewed Lunar Mission by 2040.
  - **Research & Development:** Will promote microgravity-based scientific research, technology innovations, and development activities.
  - **Industrial Boost:** Will enhance employment in high-tech space sectors and foster industrial participation.
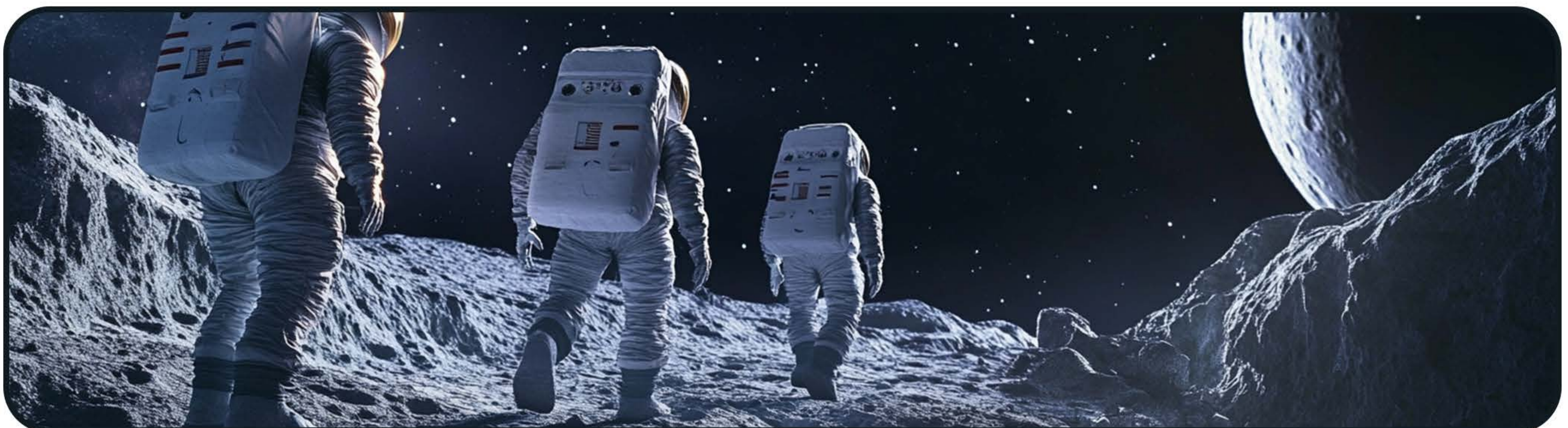
Next Generation Launch Vehicle (NGLV)

- **Cabinet Approval:** The Cabinet has also approved the development of the Next Generation Launch Vehicle (NGLV), crucial for establishing and operating BAS.
- **Key Features:**
  - Three times the payload capacity of Launch Vehicle Mark-3 (LVM3), capable of carrying up to 30 tonnes to Low Earth Orbit (LEO).
  - Reusable first stage and modular green propulsion systems for low-cost access to space.
- **Timeline:** NGLV will be demonstrated with three development flights, with an 8-year target for the completion of the development phase.

Way Forward

- **Technology Demonstration:** Continued development and testing of technologies necessary for BAS.
- **Capacity Building:** Enhancing space-related industries and workforce to meet future challenges.
- **Global Competitiveness:** BAS and NGLV will position India as a leading player in space research and exploration.

Governing AI for Humanity

○ *Why in News?*

➡️ The UN Advisory Body on Artificial Intelligence (AI) has released its final report on the international governance of AI.

➡️ Formed last year, the body was tasked with analyzing and recommending global AI governance structures.

○ *Need for Global AI Governance*

➡️ **Geopolitical Implications:** AI's rapid development concentrates power and wealth globally, impacting geopolitical and geo-economic balance.

➡️ **Control Issues:** The complexity of AI's inner workings makes it difficult to fully predict or control its evolution.

➡️ **Transboundary Technology:** AI transcends borders, making global governance necessary to avoid leaving regulation solely to market forces.

➡️ **Equitable Opportunity Distribution:** Global governance is needed to ensure that AI's benefits, like improving energy grids and public health, are equally shared.

○ *Gaps in Global AI Governance*

➡️ **Lack of Global Frameworks:** No comprehensive international AI governance frameworks exist despite numerous initiatives.

➡️ **Underrepresentation:** Only seven countries are part of all major AI governance efforts, while 118 countries, mostly from the Global South, are not represented.

➡️ **Implementation Challenges:** Commitments to AI governance are not leading to tangible outcomes, limiting equitable access to AI's benefits.
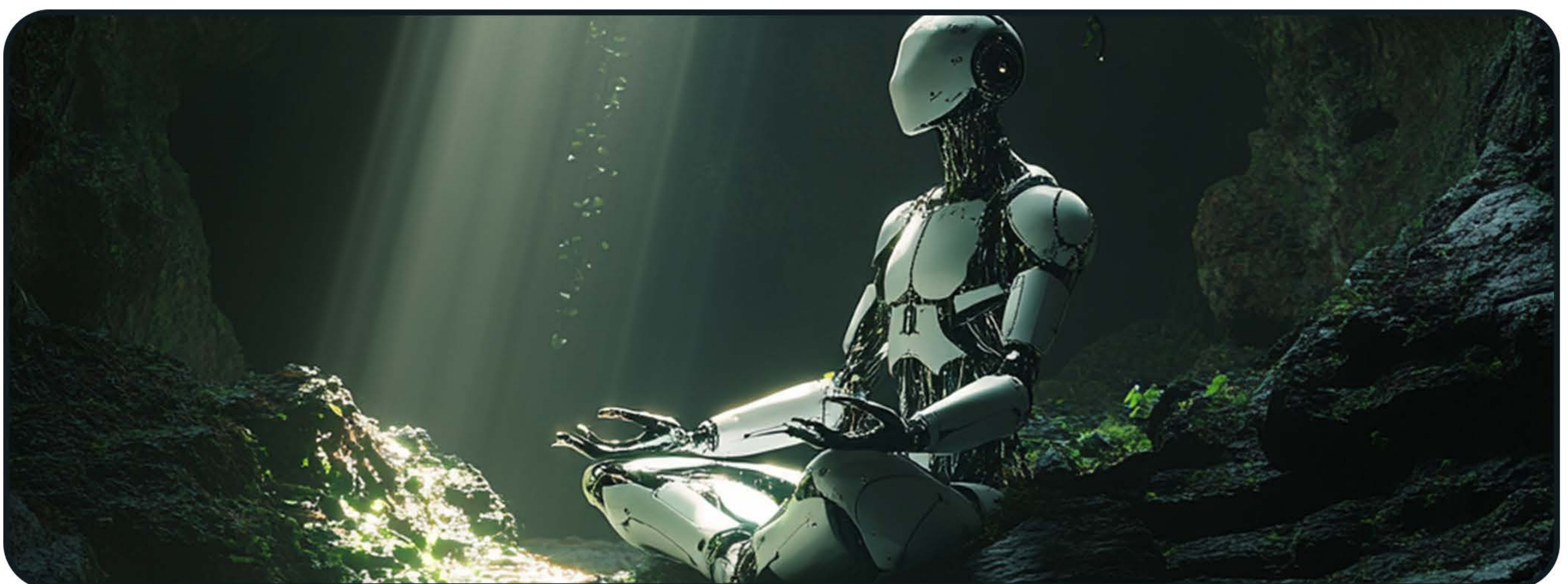
● *Key Recommendations*

- ⟹ **Independent AI Scientific Panel:** Establish an international scientific panel to guide AI governance.
- ⟹ **Policy Dialogues:** Host twice-yearly intergovernmental and multi-stakeholder discussions on AI governance.
- ⟹ **AI Standards Exchange:** Create a platform to unite stakeholders on setting AI standards.
- ⟹ **Capacity Development Network:** Establish a global network to build AI capacity, particularly in underserved regions.
- ⟹ **Global AI Fund:** Develop a fund to facilitate access to AI technology.
- ⟹ **Global AI Data Framework:** Initiate a data-sharing framework through relevant global agencies.
- ⟹ **UN AI Office:** Set up an AI office within the UN Secretariat to support and coordinate AI risk management and global governance efforts.

● *Way Forward*

- ⟹ Strengthening international cooperation on AI governance.
- ⟹ Ensuring inclusive participation from countries across the Global South.
- ⟹ Translating commitments into actionable and measurable outcomes.
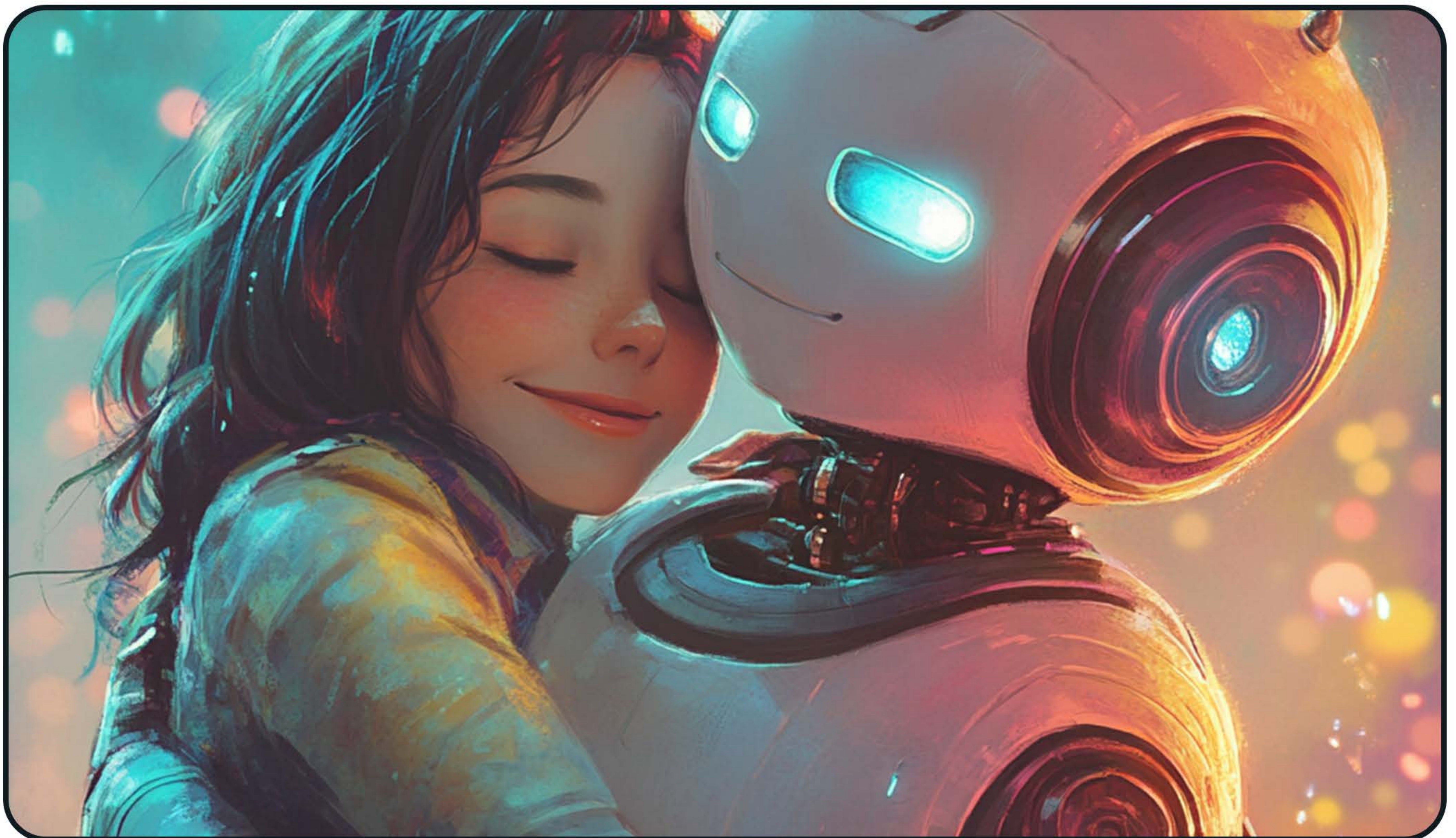
Seven Net-Zero CRCAP 2070 Released

○ *Why in News?*

⇨ Seven Net-Zero C**limate Resilient City Action Plans (CRCAP)** 2070 were released at the National Workshop on Multi-Level Action for Climate Resilient Cities, aligned with India's goal of achieving net-zero emissions by 2070.

Ahmedabad: Released its Net-zero CRCAP 2070 last year during the U20 Mayoral Summit.

○ *Key Highlights from Eight Net-Zero CRCAPs*

⇨ **Climate Finance:** All eight cities need over USD 85,000 billion until 2070 to finance climate action projects like water supply, sanitation, and energy efficiency.

⇨ **Emission Reduction:** Based on current efforts, 91% emission reductions in city emissions are possible.

⇨ **Creation of Green Jobs:** Climate actions are expected to create around 8 lakh green jobs.

○ *About Climate Resilience*

⇨ **Definition:** The ability to anticipate, prepare for, and respond to hazardous climate-related events, trends, or disturbances.

⇨ **Involves:** Assessing climate-related risks and adopting measures to mitigate and manage those risks.

○ *Need for Climate-Resilient Cities*

⇨ **Extreme Weather Events:** Strengthening resilience to withstand shocks like flooding, sea-level rise, and urban heat islands.

⇨ **Climate Change Mitigation and Adaptation:** Cities are responsible for nearly two-thirds of global energy use and over 70% of energy-related GHG emissions.

○ *Initiatives for Climate-Resilient Cities*

⇨ **Capacity Building for Low-Carbon and Climate-Resilient City Development (CapaCITIES) Project:** Supported by the Swiss Agency for Development and Cooperation (SDC) for integrating climate action in urban development.

⇨ **India's ClimateSmart Cities Assessment Framework:** Assesses the performance of Smart Cities based on five themes to address climate change.

⇨ **Resilient Cities Network (R-Cities):** Launched in 2020, focusing on improving climate resilience through the pillars of Climate Resilience, Circularity, and Equity.

- *Way Forward*
  - ⇨ **Climate Finance Mobilization:** Secure and allocate necessary funding for city-level climate actions.
  - ⇨ **Urban Planning Reforms:** Strengthen climate resilience through smarter urban development and infrastructure.
  - ⇨ **Creating Green Employment:** Leverage climate actions to generate more green jobs and sustainable livelihoods.

Venus Orbiter Mission (VOM)

Why in News?

⇒ The Union Cabinet has given the green light for the **Venus Orbiter Mission (VOM)**, which will be developed by ISRO.

⇒ The mission aims to launch a spacecraft into the orbit of Venus in **March 2028.**

Key Details

⇒ **Budget:** ₹1,236 crore, with ₹824 crore allocated for spacecraft development.

⇒ **Implementing Agency:** Department of Space (DoS), with ISRO leading the spacecraft's development and launch.

Significance

⇒ **Scientific Understanding:**

Better insights into the **Venusian surface, subsurface,** and **atmospheric processes.**

Studying the **Sun's influence on Venus' atmosphere.**

Helps understand the **evolution** of Venus and Earth, often referred to as "**sister planets**".

⇒ **Technological Advancement:**

Boosts India's capability for future **planetary missions** with larger payloads.

Optimal orbit insertion approaches can be used in future space explorations.

⇒ **Economic Impact:** Generates **employment** opportunities and **technology spin-offs** for various sectors of the economy.

About Venus

⇒ Venus is **Earth's closest planetary neighbour**, often called **Earth's twin** due to its similar **size and structure.**

⇒ **Atmosphere:** Venus has a thick, toxic atmosphere that traps heat, creating a **runaway greenhouse effect**, making it the **hottest planet** in the solar system.

⇒ **Unique Features:**

It has **thick clouds of sulfuric acid.**

Phosphine gas, a possible indicator of microbial life, has been detected in the clouds.

Venus, like **Uranus**, rotates **east to west**, unlike other planets.

Way Forward

⟹ The mission will contribute to **planetary exploration** and **space science** research.

⟹ The **March 2028 launch** marks a new step for India in its journey of **interplanetary missions.**

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