

# WEEKLY UPDATES

DATE : 23<sup>rd</sup> – 29<sup>th</sup> September

## POLITY & GOVERNANCE

### Custodial Death Judgement: Supreme Court's Split Verdict

**Context:** The **Supreme Court of India** delivered a **split verdict** in a decades-old **custodial death case**, where police officers were convicted of **culpable homicide not amounting to murder** (under **Section 304** of the **Indian Penal Code**). The case pertains to the **alleged torture and death** of a man in police custody in **December 1995**.

#### Judgment Summary:

- **Split Verdict:** The Supreme Court delivered a **split decision** on the appeal by the convicted police officers.
- **Key Issue:** The case centered around **identification of the body** and whether the **prosecution** could prove beyond a reasonable doubt that the deceased was indeed the victim of custodial death.
- **Differing Opinions:** One opinion **upheld the convictions** for custodial torture.
  - Another view **acquitted** the accused of culpable homicide due to **lack of conclusive identification**.
- **Highlight on Police Misconduct:** The ruling brought attention to the **concerns of police misconduct** and emphasized the **need for accountability** in cases involving **custodial abuse**.

#### Custodial Death Overview & Data:

##### Negatives of Custodial Deaths:

1. **Human Rights Violations:** Custodial deaths are **gross violations** of **Article 21** (Right to Life) of the Constitution. Notable cases like the **Mathura Custodial Rape Case (1972)** highlight the issue of human rights abuses.
2. **Erosion of Trust in Law Enforcement:** Incidents such as the **Jayaraj and Bennix custodial deaths** in 2020 **undermine public confidence** in the justice system, leading to mistrust of police institutions.
3. **Excessive Force:** Use of **third-degree methods** during interrogations causes **physical and mental trauma**. Many cases go unpunished due to the lack of **accountability** in police practices.

4. **Global Reputation:** India's **extradition efforts** are hampered due to **international concerns** over custodial torture. For example, the **Vijay Mallya case** highlighted these challenges.

### Measures to Combat Custodial Deaths:

1. **Strengthening Legal Systems:** Enact comprehensive laws **criminalizing custodial torture** as per Supreme Court directives (e.g., **Prakash Singh Case, 2006**).
2. **Police Reforms:** **Separate law and order functions** from investigation tasks, ensuring that police officers receive **human rights training** to prevent abuses.
3. **Technology Implementation:** Introduce **body cameras** and ensure the installation of **CCTV cameras** in all police stations for **enhanced oversight** and accountability.
4. **Oversight Mechanisms:** Expand the jurisdiction of the **National Human Rights Commission (NHRC)** to investigate **custodial deaths**, including those involving the **armed forces**.
5. **Sensitization Programs:** Regular **workshops** on ethical treatment, **human rights**, and the custodial rights of detainees for law enforcement personnel.

### Conclusion:

**Custodial deaths** severely undermine **human dignity** and **trust** in the legal and law enforcement systems. Addressing this issue requires a **multi-pronged approach**, including **police reforms**, **stronger legal frameworks**, **enhanced oversight mechanisms**, and adherence to **human rights principles**. Such measures are crucial for ensuring justice, protecting individuals in custody, and maintaining public trust in the criminal justice system.

## Child Sexual Exploitative and Abuse Material (CSEAM)

**Context:** The **Supreme Court of India** has ruled that **viewing, downloading, storing, or distributing** Child Sexual Exploitative and Abuse Material (CSEAM) is a **criminal offence** under the **Protection of Children from Sexual Offences (POCSO) Act** and the **Information Technology (IT) Act**.

### Key Judgments and Points:

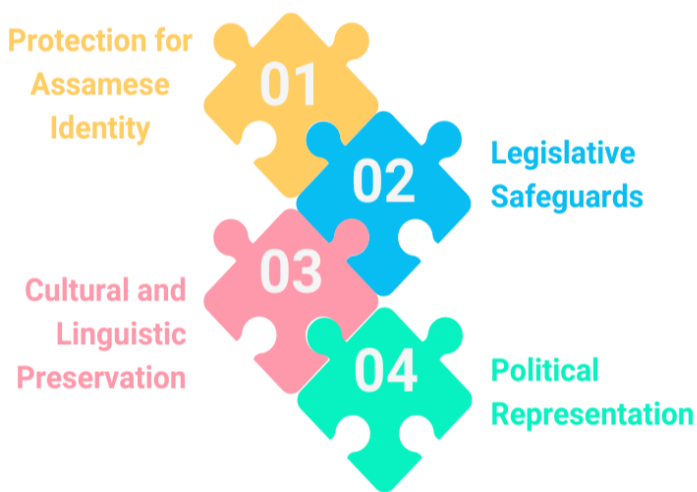
- **Ruling:** A **three-judge bench** led by **Chief Justice D.Y. Chandrachud** emphasized that the harm inflicted on a child through CSEAM persists, even after the original abuse, due to the continuous online circulation of such material.
- **Terminology Change:** The court urged **Parliament** to amend the **POCSO Act** and replace the term "**child pornography**" with **CSEAM** to more accurately describe the nature of the crime. The use of "**child pornography**" was deemed inappropriate as it trivializes the severity of the abuse.

- **Common Intent:** The judgment explained that both the viewing of CSEAM and the act of child sexual abuse have a **common intent**—exploitation for **sexual gratification**.
- **Constructive Possession:** The court introduced the concept of **constructive possession**, holding individuals accountable for having control over such material, even if they try to evade responsibility.
  - **Legal Reforms:** The ruling calls for **immediate legal reforms** and encourages the public to report **unknown or suspicious links** involving CSEAM.

## Clause 6 of the Assam Accord

**Context:** The **Assam government** has initiated steps to implement 52 recommendations made by the **Justice Biplab Sarma Committee** regarding **Clause 6** of the **Assam Accord**. This follows a meeting between **Chief Minister Himanta Biswa Sarma** and representatives of the **All Assam Students' Union (AASU)**.

### Key Features of Clause 6:



### Key Features of Clause 6:

1. **Protection for Assamese Identity:** Clause 6 mandates **safeguards** for the **identity and culture** of the **Assamese people**.
2. **Legislative Safeguards:** Calls for **legislative measures** to ensure the protection of Assamese **cultural and social interests**.
3. **Cultural and Linguistic Preservation:** Emphasizes promoting the **Assamese language** and preserving **cultural heritage** in response to demographic shifts due to **immigration**.

4. **Political Representation:** Suggests measures like **reservations** for **Assamese people** in the **state legislature, Parliament, and local bodies**.

### Justice Biplab Sarma Committee:

- **Established:** Formed in 2019 by the **Union Home Ministry**, chaired by retired Justice **Biplab Sarma**.
- **Objective:** To recommend specific measures for implementing **Clause 6** of the Assam Accord.

### Key Recommendations of the Committee:

1. **Definition of "Assamese People":** Define "Assamese people" as **indigenous tribals, citizens residing in Assam on or before January 1, 1951**, and their descendants.
2. **Land and Language Safeguards:** Limit **land ownership** in certain areas to Assamese people and make **Assamese the compulsory official language**.
3. **Reservation:** Recommend **80-100% reservations** in **government jobs, educational institutions, and political seats** for Assamese people.

4. **Cultural Heritage:** Establish cultural complexes and authorities to promote **Assam's diverse cultural practices.**

### Implementation Status:

- **Accepted Recommendations:** The Assam government has accepted 52 recommendations related to **cultural, social, and administrative safeguards.**
- **Pending Political Recommendations:** Key political suggestions like the **Inner Line Permit** and **reservations** in legislative bodies require **constitutional amendments** and remain unimplemented.

# INTERNATIONAL RELATIONS

## South China Sea Dispute

**Context:** The **South China Sea (SCS)** has become a geopolitical hotspot due to **China's aggressive territorial claims**, which are provoking tensions among countries in the **Indo-Pacific**. **China's naval and coast guard activities** have escalated military engagements and diplomatic efforts by regional countries to counter its growing influence.

## Key Events in the South China Sea:

- 1 China's Claims**  
China claims almost the entire SCS, constructing military bases and airstrips on artificial islands to solidify its position.
- 2 Grey Zone Tactics**  
Chinese vessels engage in dangerous maneuvers, including ramming smaller ships, harassing resupply missions, and using military-grade lasers.
- 3 Legal Dismissal**  
In 2016, the Permanent Court of Arbitration ruled against China's claims in the SCS, but China continues to reject the ruling.
- 4 Philippines Conflict**  
Tensions with the Philippines rose as Chinese vessels disrupted resupply missions to the Second Thomas Shoal, where the Philippines has stationed its BRP Sierra Madre.
- 5 Military Exercises**  
China conducted naval drills with Russia, demonstrating its resolve to defend its claims in the SCS.

## Key Disputed Islands/Regions:

Island/Region	Location	Claimants	Conflict
Senkaku/Diaoyu Islands	East China Sea	Japan (controls), China (claims as Diaoyu), Taiwan	Tensions over sovereignty; frequent Chinese patrols challenge Japan's control.
Spratly Islands	South China Sea	China, Taiwan, Vietnam, Philippines, Malaysia, Brunei	China's militarization and island-building have escalated disputes with other Southeast Asian nations.
Paracel Islands	South China Sea	China (controls), Vietnam, Taiwan	China controls these islands after a 1974 conflict with Vietnam, which still claims them.
Scarborough Shoal	South China Sea	China, Philippines, Taiwan	Disputed between China and the Philippines; China took control in 2012 despite a tribunal ruling in favor of the Philippines.
East China Sea	East China Sea	China, Japan, Taiwan	General tensions over territorial control, including issues surrounding the Senkaku/Diaoyu Islands.

## Impacts of the Dispute:

### Regional Impacts:

- Military Buildup:** Countries like **Japan**, **Philippines**, and **Vietnam** are increasing defense spending, acquiring advanced weapons such as **India's BrahMos** missiles.
- Strategic Alliances:** Regional nations are strengthening military cooperation with the **U.S.** through **joint exercises** and defense agreements.

### Impact on India:

- Strategic Interests:** The SCS is vital for **India's trade and security** interests. Disruptions in the region could impact India's economic and strategic positioning.
- Quad Involvement:** India's role in the **Quad** and its collaboration with **ASEAN** nations positions it as a key player in countering China's influence in the Indo-Pacific.

### Global Impact:

1. **U.S. Involvement:** The **U.S.** has committed to defending regional allies, ensuring **freedom of navigation** and opposing China's unilateral actions.
2. **Global Trade Disruption:** The SCS is a critical trade route; instability could disrupt **global supply chains**, affecting the flow of **oil, gas**, and **undersea cable networks**.

### Way Ahead:

1. **Strengthening Alliances:** Regional nations must bolster alliances with the **U.S.** and other democratic countries to counterbalance **China's dominance**.
2. **Diplomatic Engagements:** A **multilateral dialogue** involving **ASEAN, China**, and global powers should focus on **peaceful dispute resolution**.
3. **Legal Recourse:** Countries should leverage **international legal frameworks**, like the **2016 arbitration ruling**, to challenge China's actions.

## UN Summit of the Future 2024

**Context:** At the **UN Summit of the Future 2024**, **UN Secretary-General Antonio Guterres** called for urgent reforms to outdated UN institutions, focusing on **peace, security**, and **finance**. India's Prime Minister also attended the summit, advocating for **UN reforms** and greater representation for developing countries.

### What is the UN Summit of the Future 2024?

The **UN Summit of the Future 2024** aims to reform and strengthen **international governance** to address contemporary global challenges such as **sustainable development, peace, security**, and **technology**. The summit culminated in the adoption of the "**Pact for the Future**", a key agreement aimed at accelerating progress on global issues.

### Key Highlights of the UN Summit of the Future 2024:

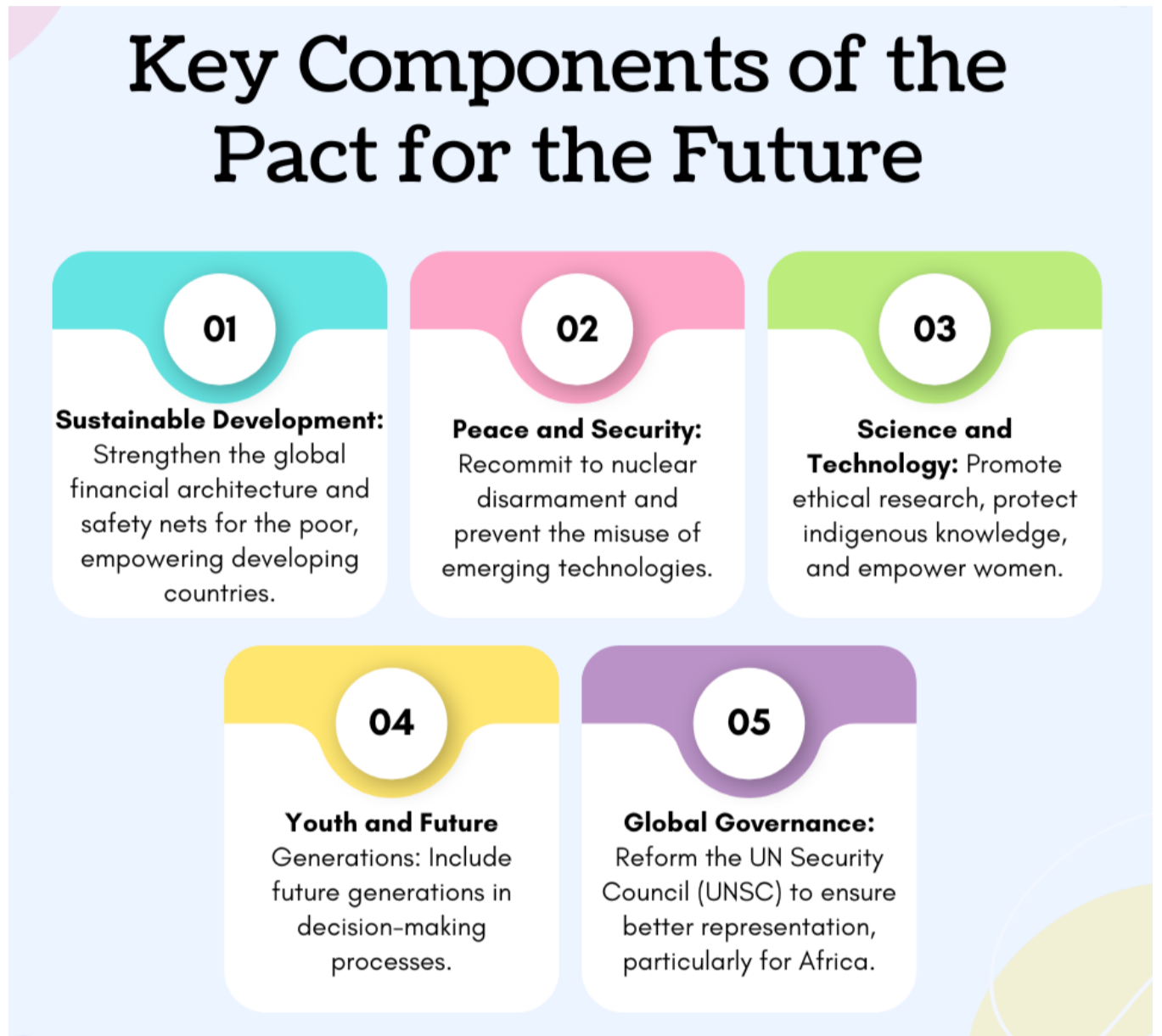
1. **Purpose:** Reform international governance to ensure a sustainable future by addressing **global challenges**.
2. **Theme:** "Multilateral Solutions for a Better Tomorrow."
3. **Outcome:** Adoption of the "**Pact for the Future**" with two annexes:
  - **Global Digital Compact.**
  - **Declaration on Future Generations.**
4. **Pact for the Future:**
  - Accelerates **Sustainable Development Goals (SDGs)**.
  - Supports **climate action** and **just transition** from fossil fuels.

- Promotes **nuclear disarmament** and **AI governance**.
5. **Global Digital Compact:** Focuses on **equitable access to technology** and **universal AI governance**.
  6. **Declaration on Future Generations:** Emphasizes **long-term thinking** and considers the interests of **future generations**.
  7. **India's Stance:** Called for **UN reforms**, particularly in the **Security Council**.

- Supported **global digital governance** and advocated for expanded **Security Council membership**.

### What is the Pact for the Future?

The **Pact for the Future** is an **action-oriented agreement** addressing global challenges like **sustainable development, peace, security, and digital cooperation**. It is aimed at reforming global governance and includes:



- **Global Digital Compact:** Promotes equitable technology access.
- **Declaration on Future Generations:** Ensures decisions are made with future generations in mind.

### Proposed Reforms by the UN Secretary-General:

1. **Security Council Reform:** Restructure the **UNSC** to reflect current geopolitical realities, addressing the under-representation of regions like **Africa, Asia-Pacific, and Latin America**.
2. **Strengthening Global Financial Architecture:** Reform international financial institutions (IMF, World Bank, WTO) to better support **developing nations** in achieving the **SDGs** and to improve their capability to tackle **global economic challenges**.

## India's Proposed Model for Security Council Reform:

Highlights	Details
<b>Enlarged Membership</b>	11 permanent members, 14/15 non-permanent members with 2-year terms.
<b>Equitable Regional Representation</b>	6 new permanent members from <b>Africa, Asia-Pacific</b> , and

## Need for National Security Strategy (NSS) in India

**Context:** India requires a **National Security Strategy (NSS)** to integrate various sectors like **defence, finance, and intelligence** into a unified framework, addressing both **traditional and non-traditional threats**. Several global powers have formal NSS documents, and while India has made attempts, a comprehensive NSS is yet to be formulated.



### What is the National Security Strategy (NSS)?

- **NSS** outlines a country's **security goals** and the methods to achieve them, focusing on traditional and non-traditional threats.
- It must align with **constitutional values** and **democratic principles**.
- **Key elements** include **threat assessments, resource allocation, and policies on defence and intelligence**.
- Countries like the **U.S., U.K., Russia, China, and Pakistan** have formal NSS documents. India's efforts, including the **Kargil Review Committee Report (2000)** and **Gen. D.S. Hooda's document (2019)**, have

not resulted in a formal NSS. However, efforts are underway to introduce one.

### Significance and Benefits of a National Security Strategy for India:

1. **Meet Changing Security Dynamics:** Encourages regular review of **threats, opportunities**, and global security trends.
  - **Example:** Major powers like the **US** and **UK** have updated NSS to address hybrid warfare and China's naval growth.

2. **Framework for Effective Long-term Planning:** Helps avoid **short-term**, hasty decisions on critical issues.
  - **Example:** Avoiding regime-centric decisions like discontinuing **five-year Defence Plans**.
3. **Strategic Signaling in the World Order:** Clarifies India's strategic role, particularly in the **Indian Ocean** and the **Indo-Pacific**.
  - **Example:** Signaling India's intent to counter China's expansion.
4. **Operational Clarity:** Guides decisions in areas like **theatre commands** and operational delegation.
  - **Example:** Clear directives for military operations.
5. **Adopt a Whole-Nation Approach:** Coordinates national power effectively for responses to **hybrid warfare**, **cyber threats**, and **counter-terrorism**.
  - **Example:** Strengthening national responses through synergistic efforts.

## Challenges in Formulating an NSS in India:

1. **Lack of Political Will and Consensus:** Political disagreements and fear of accountability hinder progress.
  - **Example:** No consensus despite **Naresh Chandra Committee** recommendations.
2. **Loss of Strategic Flexibility:** A formal NSS could bind leadership to rigid policies, limiting adaptability.
  - **Example:** Israel manages security effectively without a formal NSS.
3. **Resource Allocation and Institutional Support:** Implementing an NSS requires significant financial and human resources, which are often inadequate.
  - **Example:** India's limited defence think tanks and budget constraints compared to countries like the US and China.
4. **Changing Threat Landscape:** Continuously adapting the NSS to address **cyber threats**, **terrorism**, and other evolving challenges.



## Quad Leaders' Summit and India's Strategic Role

**Context:** Recently, the Prime Minister of India attended the **sixth Quad Leaders' Summit** in Wilmington, Delaware, hosted by **U.S. President Joe Biden**, with the participation of **Australian Prime Minister Anthony Albanese** and **Japanese Prime Minister Fumio Kishida**. The summit focused on reaffirming the Quad's commitment to a **free and prosperous Indo-Pacific**.

### Key Points Emphasized by PM Modi:

1. **Upholding International Law:** Emphasized the Quad's role in maintaining **international law, sovereignty, and peace**.



India will host the next **Quad Summit in 2025**, and the leaders adopted the **Quad Wilmington Declaration**.

### What is Quad?

The **Quad (Quadrilateral Security Dialogue)** is a **strategic partnership** between **Australia, India, Japan, and the U.S.**. Formed during the **ASEAN Regional Forum**, it accounts for:

- **24%** of the global population.
- **35%** of the world's GDP.
- **18%** of global trade.

Though **not a military alliance**, it focuses on **security, economic cooperation**, and maintaining a **free and open Indo-Pacific**.

### Timeline: Genesis and Evolution of Quad

Year	Event
2004	Formation of the Quad to coordinate <b>Indian Ocean Tsunami</b> relief.
2007	Transformed into a <b>strategic dialogue</b> on Indo-Pacific issues.
2008-2012	Australia withdraws due to concerns over <b>China</b> , but the Quad revives later.
2017-2024	Expanded its focus to new policy areas, including <b>military exercises</b> .
2021-2024	Annual <b>Quad Leaders' Summits</b> set the agenda for collaboration.

## Key Quad Policies and Initiatives

Policy/Initiative	Description
Health	<b>Quad Vaccine Partnership</b> , evolving into <b>Quad Health Security Partnership</b> with a focus on <b>e-health systems</b> and <b>pandemic preparedness</b> .
Climate	<b>Quad Climate Change Adaptation and Mitigation Package (Q-CHAMP)</b> . Focus on <b>clean energy supply chains</b> in the Indo-Pacific.
Critical and Emerging Technology	<b>Semiconductor Supply Chain Initiative</b> launched in 2021 to diversify technology supply chains.
Space	<b>Indo-Pacific Partnership for Maritime Domain Awareness (IPMDA)</b> launched in 2022.
Infrastructure	<b>Trilateral Partnership for Infrastructure Investment in the Indo-Pacific (TIP)</b> launched in 2018.
Cybersecurity	<b>Quad Cybersecurity Partnership</b> established in 2022.

## Quad's Contribution to India's Strategic Interests

- Counterbalance to China:** The Quad provides India a platform to counterbalance **China's aggressive stance**, especially regarding **border hostilities**.
- Strategic Partnerships:** Facilitates strategic partnerships with **like-minded democracies**, enhancing India's **diplomatic leverage** in the Indo-Pacific.
- Free and Open Indo-Pacific:** Essential for India in the face of **China's assertiveness** in the Indo-Pacific region.
- India as a Net Security Provider:** Quad strengthens India's role as a **regional security provider**, particularly in the **Indian Ocean**.
- Multipolar World:** India's ambition for a **rule-based multipolar world** aligns with Quad's objectives of promoting **regional stability**.
- Maritime Security Cooperation:** Joint naval exercises and **patrols** enhance India's maritime capabilities in addressing common challenges in the Indo-Pacific.
- Infrastructure Development:** Quad's focus on **infrastructure development** aligns with India's interests in promoting **connectivity** in the Indo-Pacific.

8. **Humanitarian Assistance and Disaster Relief (HADR):** Boosts India's capacity to respond to **natural disasters** in the region, showcasing its commitment to **regional stability**.
9. **Technology and Cybersecurity Cooperation:** Collaboration on emerging technologies strengthens **India's cyber resilience** and technological capabilities.
10. **Promotion of Democratic Values:** Quad promotes **democratic principles**, the **rule of law**, and international norms, aligning with India's role as the **world's largest democracy**.

### Issues Related to Quad:

1. **Undefined Vision:** Despite potential for cooperation, the Quad lacks a clear **strategic mission**.
2. **Maritime Focus:** Heavy emphasis on **Indo-Pacific maritime security** limits its engagement in **Asia-Pacific** and **Eurasian** regions.
3. **India's Aversion to Alliances:** India's reluctance to join formal **treaty alliances** hinders stronger engagement with the Quad.

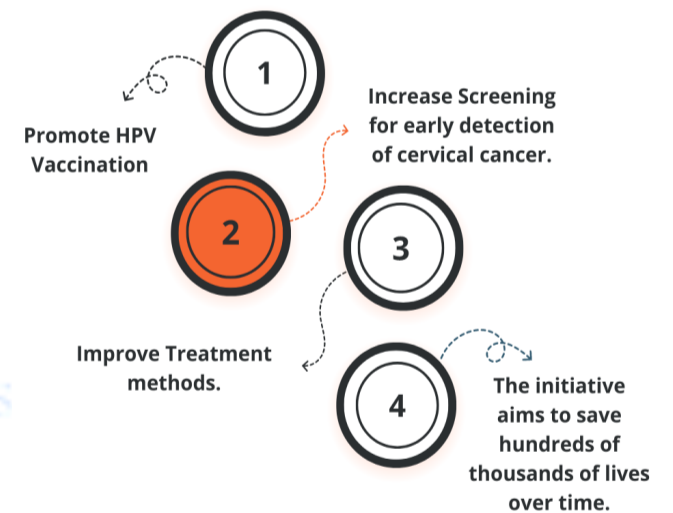
## Cancer Moonshot Initiative

**Context:** The **Quad countries**—the **United States, Australia, India, and Japan**—have launched the **Cancer Moonshot Initiative**, focusing on reducing **cervical cancer** in the **Indo-Pacific** region.

### Key Points:

- **Objective:** The initiative aims to improve the **cancer care ecosystem** by enhancing **health infrastructure, research collaboration, data systems, and prevention, detection, treatment, and care**.
- **Focus on Cervical Cancer:** Cervical cancer, the **third leading cause** of cancer deaths among women in the region, can be prevented through **HPV vaccination** and **early screening**, though access to these preventive measures is limited.
- **Collaboration:** The Quad countries plan to collaborate with **research institutions**, engage the **private sector** and **non-governmental organizations**, and work with global bodies like **Gavi** and the **International Atomic Energy Agency (IAEA)** to lower **screening costs** and improve **cancer care access**.

### Actions Under the Initiative



These initiatives underscore the commitment of **India's legal framework** to protecting children from **online sexual exploitation** and the collaborative efforts of **Quad countries** in tackling **cervical cancer** in the Indo-Pacific. Both areas are crucial for advancing **public health** and **justice reform** on national and global platforms.

## Shanghai Cooperation Organisation (SCO)

**Context:** India's participation in the **Shanghai Cooperation Organisation (SCO)** remains significant, with discussions regarding **External Affairs Minister S. Jaishankar** potentially attending the **2024 SCO meeting in Pakistan**, despite strained bilateral relations between India and Pakistan.

### About SCO:

1. **Origin:** Started as the “**Shanghai Five**” in **1996** to address **security issues** among member nations.
2. **Establishment:** **Formed in 2001**, with **Uzbekistan** joining, evolving into the **SCO**.
3. **Members:** 10 members, including **India, China, Russia, Pakistan**, and the recent addition of **Belarus**.
4. **2024 Summit Host:** **Astana, Kazakhstan**.
5. **2025 SCO Summit:** **China** will assume the SCO chairmanship, with **Qingdao** designated as the SCO's **tourism and cultural capital** for 2024-2025.

### 2024 SCO Summit:

1. **New Membership:** **Belarus** joined as the **10th member**.
2. **Astana Declaration:** Adoption of **25 key agreements** on topics like **energy and security**.
3. **India-China Dialogue:** Discussions focused on **resolving border disputes** and **disengagement** along the **Line of Actual Control (LAC)**.

## UNSC Reform: G4's Call for Urgent Change

**Context:** With the United Nations approaching its **80th anniversary**, the **Group of Four (G4)**—India, Brazil, Germany, and Japan—have reiterated the need for **UN Security Council (UNSC) reform**, calling for it to be **more representative, democratic, and transparent**, especially with regard to the **Global South**.

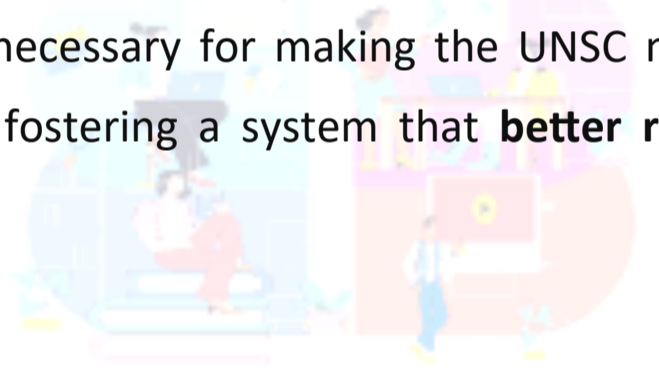
### Background of the Issue:

1. **G4's Demand:** The **G4** seeks **urgent reform** of the UNSC to include both **permanent and non-permanent members** from **developing countries**.
  - They emphasize the need for the UNSC to reflect **contemporary global realities** and increase **representation** for countries from the **Global South**.
2. **L69 and C10 Groups:** **L69 Grouping:** Comprising 32 developing nations from **Asia, Africa, Latin America, the Caribbean, and Pacific Small Island Developing States**, the L69 calls for the **expansion** of both **permanent and non-permanent categories** in the UNSC.

- **C10 Grouping:** Comprising 10 African nations, the **C10** advocates for **African representation** in the UNSC, pushing for the **Common African Position** as outlined in the **Ezulwini Consensus** and **Sirte Declaration**.
3. **The UNSC:** Established in **1945**, the UNSC consists of **15 members**—**5 permanent** (P5: **UK, USA, Russia, China, France**) and **10 non-permanent members** elected for two-year terms.
- Responsible for maintaining **international peace** and **security**, the P5 wield **veto power**, giving them disproportionate influence over UNSC decisions.

### Significance of UNSC Reform:

1. **Credibility and Legitimacy:** Reforming the UNSC is critical for **enhancing its credibility** and **legitimacy**.
  - By making the UNSC more **inclusive** and **representative** of current global dynamics, especially for developing countries, its decisions will carry greater **global acceptance**.
2. **Global Governance:** Reform is necessary for making the UNSC more effective in addressing **global conflicts, security threats**, and fostering a system that **better represents the diverse geopolitical landscape**.



## DEFENCE & SECURITY

### Minerals Security Finance Network (MSFN)

**Context:** India has formally joined the **Minerals Security Finance Network (MSFN)**, a **US-led initiative** aimed at securing global **critical mineral supply chains**.

#### About Mineral Security Finance Network (MSFN):

1. **Initiative:** **MSFN** is part of the broader **Minerals Security Partnership (MSP)**, focusing on ensuring secure supply chains for **critical minerals** like **lithium, cobalt, nickel, and rare earth elements**.
2. **Global Focus:** The network aims to reduce **dependency on China** for critical minerals, which are essential for **clean energy, electronics, and electric vehicles (EVs)**.
3. **Key Objectives:** **Uniting Development Finance Institutions (DFIs) and Export Credit Agencies (ECAs)** to fund **critical mineral projects**.
  - Promote **public-private cooperation** to meet the rising global demand for minerals.
4. **India's Role:** India's participation aligns with its focus on developing **EVs, electronics, and semiconductors**, ensuring a steady **supply of critical minerals** for domestic needs.
5. **China's Dominance:** China controls **70% of rare earth production** and has a dominant **processing infrastructure** for minerals sourced globally, especially from **Africa**.

### DRDO Deep Technology Initiative

**Context:** The **Defense Research and Development Organisation (DRDO)** is launching a first-of-its-kind initiative aimed at remodelling its **research programme** toward **emerging technologies** for **military use**. This initiative is backed by a **₹1-lakh crore corpus** announced in the interim budget.

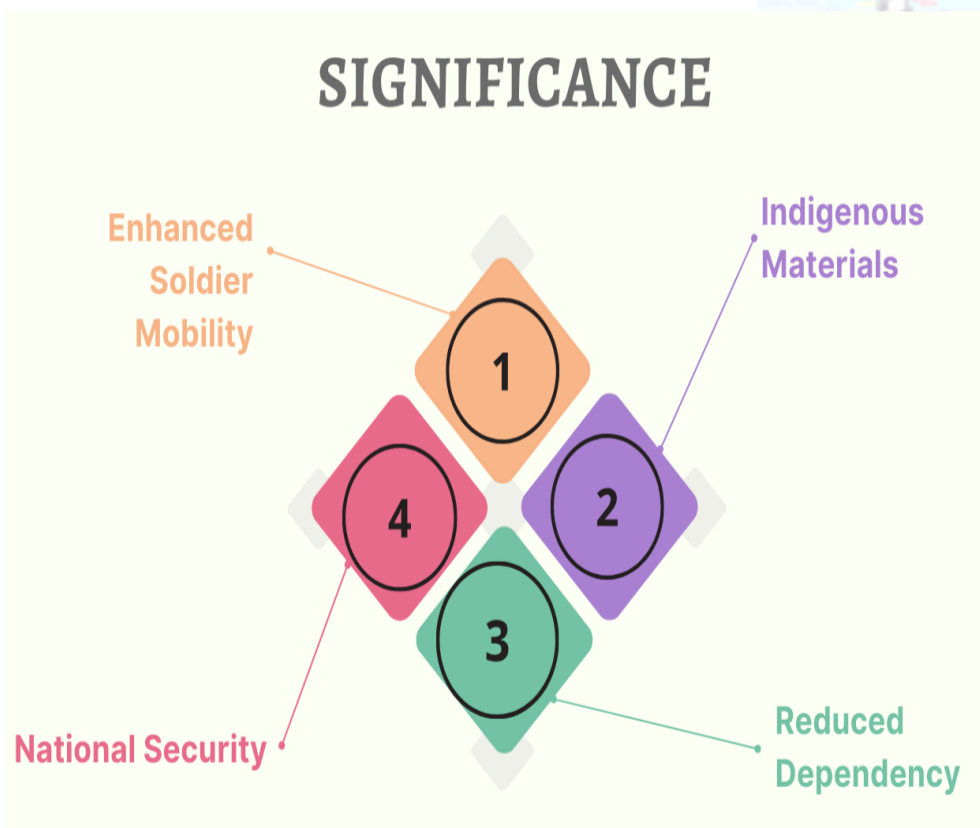
#### Key Highlights of the DRDO Deep Technology Initiative:

1. **Significance:** DRDO is funding **five high-value deep tech projects**, with up to **₹50 crore** allocated per project.
  - The focus is on **indigenisation** and **reducing dependency on imports** by promoting **cutting-edge technologies**.
2. **Emerging Technologies:** Projects are centered on **quantum computing, blockchain, artificial intelligence**, and other transformative technologies.
  - Aims to have a **long-term impact on national security** through **disruptive innovations**.

3. **Global Inspiration:** Modeled on global initiatives like the **U.S. DARPA**, the program seeks to revolutionize India's **defence capabilities** with futuristic technologies.
4. **Project Funding and Collaboration:** The **Technology Development Fund (TDF)** will engage **MSMEs** and **start-ups** for R&D in **military hardware** and **software**.
  - **Funding** will be distributed in **five tranches**, with the first installment capped at **20%**, based on project appraisals by an **integrated expert team**.

## ABHED Jackets: Lightweight Bulletproof Protection for the Indian Armed Forces

**Context:** The **Defence Research & Development Organisation (DRDO)**, in collaboration with **IIT Delhi**, has developed **ABHED** (Advanced Ballistics for High Energy Defeat) jackets. These **lightweight bulletproof jackets** are designed to provide enhanced protection while ensuring soldier mobility, meeting the evolving demands of the **Indian Armed Forces**.



### Features of ABHED Jackets:

1. **Materials:** Made from **polymers** and **indigenous boron carbide ceramic material**, providing both **strength** and **reduced weight**.
2. **Development:** Developed at the **DRDO Industry Academia Centre of Excellence (DIA-CoE)** at **IIT Delhi** using **advanced simulation** and **material characterization techniques**.
3. **Design and Protection:** Offers **360-degree protection** with a **modular design** and front/rear armor plates.

- Weighs between **8.2 kg to 9.5 kg**, depending on the required **BIS level standards**.
4. **Weight Advantage:** Lighter than the **General Staff Qualitative Requirement** specified by the **Indian Army** and meets the highest **threat level standards**.

# GEOGRAPHY & DISASTER MANAGEMENT

## Eastern Rajasthan Canal Project (ERCP)

**Context:** A new memorandum of agreement will be signed between the **Rajasthan** and **Madhya Pradesh** governments for implementing a modified version of the **Eastern Rajasthan Canal Project (ERCP)**.

**Aim:**

The ERCP is designed to address **drinking water** and **irrigation needs** in **13 districts of Rajasthan**. By linking major rivers, the project will ensure better **water resource utilization**, benefiting both Rajasthan and Madhya Pradesh.

**Rivers Involved in the Project:**

1. **Chambal River:**

- **Origin:** Singar Chouri Peak, **Vindhya mountains**, Indore, Madhya Pradesh.
- **Tributaries:** Banas, Kali Sindh, Sipra, Parbati.

2. **Parvati River:**

- **Origin:** **Vindhya Range**, Sehore District, Madhya Pradesh.
- **Tributaries:** None significant.

3. **Kali Sindh River:**

- **Origin:** Bagli, **Dewas District**, Madhya Pradesh.
- **Tributaries:** Parwan, Niwaj, Ahu.

**Significance:**

The **ERCP** will help **harvest surplus water** during the rainy season for the **water-scarce regions** of Rajasthan. It aims to ensure a sustainable solution for **drinking water** and **irrigation** till **2051**, alleviating water scarcity and boosting agricultural productivity in the region.

## Urban Flooding: Causes, Impacts, and Mitigation Measures

**Context:** **Guwahati**, like many other fast-growing urban centers, is grappling with frequent **urban flooding**. Despite several urban planning initiatives, the city's **infrastructure** and **drainage systems** are insufficient, worsened by **rapid urbanization**, **deforestation**, and **poor planning**.

## Causes of Urban Flooding:

### Natural Causes:

1. **Heavy Rainfall:** Guwahati experiences torrential downpours during the **monsoon season**, leading to surface runoff that overwhelms existing drainage systems.
2. **Topography:** The city's **hilly terrain** and **low-lying areas** prevent effective water drainage, especially when **natural outlets** are blocked.
3. **River Overflow:** Proximity to the **Brahmaputra River** increases flood risks as the river swells due to heavy rainfall or **glacial melt** upstream.

### Man-Made Causes:

1. **Unplanned Urbanization:** Rapid, unchecked development has blocked **natural drainage** systems, causing water to accumulate in low-lying areas.
2. **Encroachment of Wetlands:** **Wetlands**, which once acted as natural water sinks, have been encroached upon, reducing the city's **water absorption capacity**.
3. **Inadequate Drainage Infrastructure:** **Outdated drainage systems** designed in the 1970s are unable to handle the current volume of rainfall and runoff.
4. **Loss of Permeable Surfaces:** **Excessive concretization** with limited **green spaces** has reduced **groundwater recharge** and increased surface runoff, causing waterlogging.

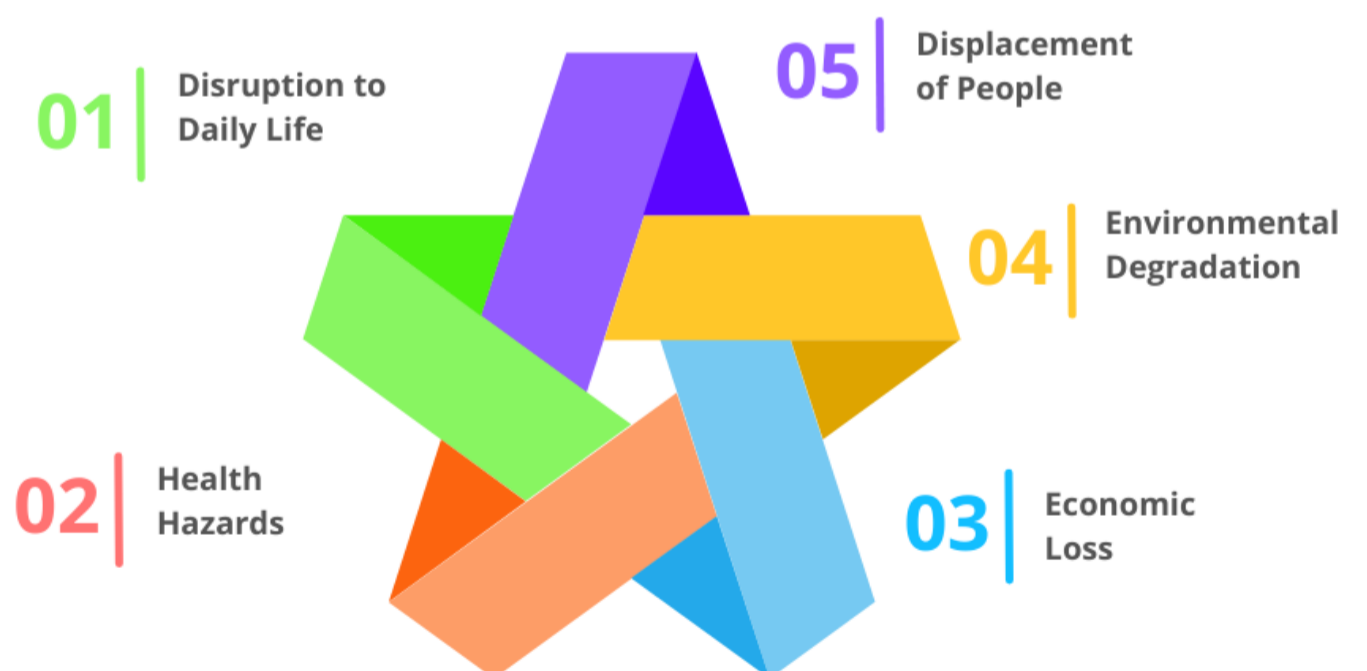
### Mitigation Measures:

#### 1. Comprehensive Urban Planning:

- Adopt **sponge city concepts** with **green infrastructure** such as **rain gardens** and **permeable pavements** to absorb excess water.
- Implement **sustainable land-use practices** to prevent further encroachment on wetlands and water bodies.

2. **Drainage System Upgrades:** Follow **NDMA guidelines** to modernize drainage systems capable of handling extreme rainfall events.

## Impacts/Consequences of Urban Flooding



- Revive and upgrade old drainage plans while focusing on cleaning and expanding **natural water channels** like the **Bhoroglu River**.
3. **Watershed Management:** Restore and protect **wetlands, lakes, and ponds** to retain water naturally and reduce surface runoff.
    - Promote **rainwater harvesting** to help recharge groundwater.
  4. **Resilient Infrastructure:** Ensure that all new construction in **flood-prone areas** adheres to **building codes** designed to prevent waterlogging.
    - Prohibit **basement construction** in low-lying areas and enforce **slope analysis** to prevent risky development.
  5. **Early Warning Systems and Crisis Management:** Establish **early warning systems** to alert citizens in flood-prone regions.
    - Form **local disaster management committees** involving **NGOs, CBOs,** and local stakeholders for an efficient response to floods.

### Conclusion:

To combat urban flooding, cities like Guwahati must integrate **traditional water management techniques** with **modern solutions** such as **green infrastructure** and **strict regulations**. Comprehensive urban governance, involving the public and other stakeholders, will ensure more resilient and **future-proof urban development** that can mitigate both **natural** and **man-made causes** of flooding.

## 5 Years of Coalition for Disaster Resilient Infrastructure (CDRI)

**Context:** The **Coalition for Disaster Resilient Infrastructure (CDRI)** marks its **fifth anniversary** and announced a **\$2.5 million fund** to support cities in 30 low and middle-income countries, including India. This **Urban Infrastructure Resilience Programme (UIRP)** focuses on improving awareness, planning, and financial resources for **integrating climate resilience into infrastructure**.

### About CDRI:

- **Establishment:** Launched by the **Prime Minister of India** during the **UN Climate Action Summit** in **New York (2019)**.
- **Objective:** To promote the **resilience of infrastructure** systems to **climate and disaster risks**, ensuring sustainable development.
- **Global Partnership:** CDRI includes **national governments, UN agencies, multilateral development banks, the private sector,** and **academic institutions**.

- **Secretariat:** Based in **New Delhi**.
- **Membership:** Since its inception, **31 countries, 6 international organizations, and 2 private sector organizations** have joined.

### Significant Milestones:

- **Headquarters Agreement (HQA):** Approved by the **Union Cabinet** for ratification between the **Government of India** and CDRI.
  - Provides **independent international legal persona** for CDRI, enabling it to function more efficiently internationally.
- **2022 Upgradation:** Recognition of CDRI as an **International Organisation** to grant it **immunities and privileges** under the **UN (Privileges and Immunities) Act, 1947**.

### CDRI's Role in Enhancing Infrastructure Resilience:

#### Improving Reach:

1. **Connectivity Infrastructure:** Prioritizes **rural roads, telecom, and other connectivity infrastructure** to enhance access for **remote and vulnerable communities**.
2. **Partnerships with Development Banks:** Collaborates with banks like the **Asian Development Bank (ADB)** to mobilize financing for projects in underserved regions.
3. **Geospatial Models:** Develops models to **identify underserved regions** prone to disasters to guide investment priorities.
4. **Reducing Disaster Risks:** Advocates **last-mile connectivity, facilitating evacuations, monitoring, and service delivery** during disasters.

#### Enhancing Resilience:

1. **Resilience Standards:** Formulated **10 resilience standards** and guidelines that can be customized based on local needs and hazard risks.
2. **Lifecycle Resilience Solutions:** Trains infrastructure agencies on **disaster-resistant design, construction, and proactive asset management**.
3. **Engineering Innovations:** Promotes **bio-engineering** for slope stabilization and **decentralized renewable energy systems** to strengthen eco-infrastructure.
4. **Critical Infrastructure:** Develops resilience plans for **power grids, communication networks, and transport systems** in collaboration with countries.
5. **Risk Assessment Tools:** Assists countries with **diagnostic tools** and simulations to assess **infrastructure risks and resilience gaps**.

## ECONOMY

### China Shock 2.0: Economic Implications and India's Response

**Context:** The **United States** has imposed steep tariffs on **Chinese imports**, including a 100% duty on **electric vehicles**, as part of a global effort to counter the influx of Chinese goods. This phenomenon, termed "**China Shock 2.0**", reflects concerns over China's rapid export growth in high-tech sectors like **solar equipment**, **electric vehicles**, and **semiconductors**. India, along with other countries, is also taking steps to curb Chinese imports to safeguard domestic industries.

#### What is China Shock 2.0?

1. **Definition:** Refers to **China's rapid export growth** in advanced, high-tech sectors such as **solar equipment**, **electric vehicles**, and **semiconductors**.

- Occurs amid China's **economic slowdown** due to a **property crisis** and **weak consumer demand**, driving its reliance on **export markets**.

2. **Global Response:**

- Countries like the **U.S.**, **India**, and others fear the impact of China's high-tech export surge on **job losses** in **manufacturing** and the risk of growing **economic dependence** on Chinese goods.

#### Impact on India:

1. **Growing Imports:** Despite restrictions, **India's imports from China** surged from **\$70 billion in FY19** to **\$101 billion in FY24**, affecting sectors like **steel**, **solar equipment**, and **electronics**.
2. **Solar Sector Dominance:** India remains reliant on **China** for 80% of its **solar cells** and modules, which impacts India's ability to achieve its **renewable energy goals**.
3. **Steel Industry Pressure:** **Chinese steel imports** are rising, reducing **profit margins** for Indian steelmakers and raising calls for **government intervention**.
4. **Electronics:** While **mobile phone manufacturing** in India has grown, the country's dependency on **Chinese electronics** components remains largely unchanged.

#### Measures to Counter China Shock 2.0:

1. **Anti-Dumping Duties:** India has initiated **over 30 anti-dumping investigations** against Chinese goods in 2024 to protect domestic industries from **unfair trade practices**.
2. **Renewable Energy Push:** India is investing **\$4.5 billion** in **clean energy manufacturing**, aiming to reduce dependency on **Chinese solar imports** by building **domestic production capacity**.

3. **Strengthening Local Supply Chains:** The government is focused on boosting **domestic production** in key sectors like **steel, electronics, and renewable energy** to create **resilient supply chains** and reduce reliance on **Chinese imports**.

### Conclusion:

**China Shock 2.0** highlights the risks of economic over-dependence on China in critical sectors. To counter this, India must advance its **Atmanirbhar Bharat (self-reliant India)** initiative, focusing on **building resilient domestic industries** in sectors like **renewable energy, electronics, and steel**. This will ensure **economic independence** and mitigate the impacts of external shocks like **China's export growth**, positioning India as a **global manufacturing hub** in the long run.

## T+0 Settlement System

**Context:** The implementation of the **T+0 (same-day)** settlement cycle for **institutional clients**, set to begin on **September 30, 2024**, has been delayed by stock exchanges. It was first introduced for **retail clients** in a **beta version** with 25 securities in March 2024.

### T+0 and T+1 Settlement Cycles:

1. **T+0 Settlement: Definition:** Refers to the settlement of trades where both **funds and securities** are exchanged on the **same day**.
  - **Benefits:** Faster settlements reduce **counterparty risk** and provide **quicker access to funds**.
2. **T+1 Settlement: Definition:** Trades are settled **one business day** after the transaction date.
  - **Implementation:** Introduced in **2021** and implemented in phases, benefiting market participants with quicker settlements.

### Key Issues:

- **Resistance from Foreign Portfolio Investors (FPIs):** FPIs are concerned about the **pre-funding requirements** and the current lack of infrastructure for seamless adoption of T+0.

### Significance for the Economy:

1. **Faster Settlements:** Reduces risks associated with **delayed settlements** and improves **liquidity** in the markets.
2. **Efficiency for Retail Investors:** T+0 optimizes **fund utilization**, especially for **retail investors** with limited capital, offering quicker settlement of trades.
3. **Improved Accuracy:** T+1 has already enhanced **settlement accuracy** and **efficiency**, particularly for **FPIs**, reducing error rates and improving market function.

## Production Linked Incentive (PLI) Scheme for Textiles

**Context:** India's **Production Linked Incentive (PLI) scheme** is poised to give a major boost to the **textile sector**, with disbursements set to begin in this fiscal year. The scheme aims to revitalize India's **textile exports**, create jobs, and make India more competitive globally.

### Summary of PLI for Textiles:

1. **Incentives for Companies:** Around a dozen companies will receive **incentives** under the **PLI scheme** for **man-made fibers (MMF)** and **technical textiles**.
2. **Export Stagnation:** India's **textile exports** have remained stagnant at **\$35 billion**, while competitors like **Vietnam** and **Bangladesh** have gained market share due to **favorable trade agreements**.
3. **Job Creation:** The scheme aims to create **4.5 to 6 crore jobs** in the textile sector by **2030**, and increase the market size of the sector to **\$350 billion**.

### About the PLI Scheme:

1. **Origin:** Launched in **2021** to boost **domestic manufacturing**, reduce imports, and enhance exports in key sectors.
2. **How It Works:** Provides **performance-linked incentives** based on **incremental sales** of domestically manufactured products.
3. **Sectors Covered:** The PLI scheme covers **13 sectors**, including **electronics, textiles, automotive, pharmaceuticals, telecom, and renewable energy**.
4. **Budget:** Allocated a budget of **Rs 1.97 lakh crore** (approximately **\$28 billion**)

## Global Innovation Index (GII) 2024

**Context:** India has climbed 42 positions in the **Global Innovation Index (GII)** since 2015, now ranking **39th** out of 133 economies in the 2024 edition.

### 2024 Report Highlights:

1. **Published by:** **World Intellectual Property Organisation (WIPO)**.
2. **India's Rank:** India ranks **39th** out of **133 economies**, an improvement from **40th** in 2023.
3. **Key Indicators:**
  - **ICT Services Exports:** India ranks **1st** globally, showcasing its leadership in **technology-driven services**.
  - **Venture Capital Received:** India's **start-up ecosystem** secures a strong position, attracting significant **venture capital**.
  - **Unicorn Companies:** India ranks **8th** globally in the number of **unicorns**.

### Positives:

1. **Start-up Growth:** India's dynamic **start-up ecosystem** continues to foster **innovation**.
2. **ICT Services Leadership:** India leads the world in **technology-driven services**, particularly in **ICT services exports**.
3. **Venture Capital:** **Strong investments** in venture capital are boosting **innovation** and growth.

### Challenges:

1. **Low R&D Spending:** India needs to significantly increase its **research and development (R&D) investments** to remain competitive.
2. **Manufacturing Innovation:** **Innovation challenges** in the **manufacturing sector** need to be addressed for better global competitiveness.
3. **Infrastructure:** **Gaps in innovation infrastructure** remain a hurdle for sustained growth in various sectors.

## Periodic Labour Force Survey (PLFS) 2023-24: Key Highlights

**Context:** The **Periodic Labour Force Survey (PLFS) Annual Report (July 2023 – June 2024)** provides an in-depth analysis of labour market trends in India, capturing key statistics on **labour force participation, employment, and unemployment**.

### Key Findings from the PLFS 2023-24 Report:

#### 1. Labour Force Participation Rate (LFPR):

- **Overall LFPR:** Increased from **57.9%** in 2022-23 to **60.1%** in 2023-24 for individuals aged 15 years and above.
- **Female LFPR:** Rose significantly from **37.0%** to **41.7%**.
- **Male LFPR:** Slight increase from **78.5%** to **78.8%**.

#### 2. Worker Population Ratio (WPR):

- **Overall WPR:** Increased from **56.0%** to **58.2%**.
- **Female WPR:** Jumped from **35.9%** to **40.3%**.
- **Male WPR:** Marginal increase from **76.0%** to **76.3%**.

#### 3. Unemployment Rate (UR):

- **Overall UR:** Remained at **3.2%** for both males and females.
- **Male UR:** Slight decrease from **3.3%** to **3.2%**.
- **Female UR:** Increased from **2.9%** to **3.2%**.

### About the Periodic Labour Force Survey (PLFS):

The **PLFS** is conducted by the **National Statistical Office (NSO)** to assess the **employment and unemployment** conditions in India. It provides timely insights into the **labour market**, assisting policymakers in decision-making.

### Objectives of PLFS:

1. **Assess Employment Status:** Provides detailed information on labour force participation, employment, and unemployment.
2. **Monitor Employment Trends:** Tracks changes in the labour market and evaluates **economic conditions**.
3. **Support Policy Formulation:** Essential data for policymakers to create **labour-related policies** and programs.

### Key Features of PLFS:

- **Household Survey:** Information is collected from households across both **rural** and **urban** areas, making it **nationally representative**.
- **Annual and Quarterly Data:** Includes both **annual** and **quarterly** surveys for timely and comprehensive labour market insights.
- **Employment Indicators:** Captures a range of indicators like the **Labour Force Participation Rate (LFPR)**, **Worker Population Ratio (WPR)**, and **Unemployment Rate (UR)**.

## 100 Years of ICAR-NISA

### About ICAR-National Institute of Secondary Agriculture (NISA):

- **Established:** 1924 as the **Indian Institute of Natural Resins and Gums** in Ranchi, Jharkhand.
- **Renamed:** In 2022, it became the **National Institute of Secondary Agriculture (NISA)**.
- **Operating under:** The **Ministry of Agriculture and Farmers' Welfare**.

### About Secondary Agriculture:

- Involves adding value to **primary agricultural products** and related activities like **beekeeping, poultry farming, and agritourism**.
- Focuses on converting **agricultural produce, residues, and by-products** into **high-value items** for **food, industrial, and medicinal uses**.
- **Examples:** Making jaggery from sugarcane or extracting oil from rice bran.

### Significance of Secondary Agriculture:

1. **Increases Farmer Income:** Through value-added products.

2. **Promotes Sustainability:** Encourages the use of crop residues for economic gain.
3. **Boosts Rural Cottage Industries:** Enhances local industries by introducing value-added processes.
4. **Meets Growing Market Demand:** Helps fulfill the rising demand for **ready-to-eat** and **functional foods**.

## Semiconductor Fabrication Plant in India

**Context:** India and the **U.S.** have announced a collaboration to establish India's **first semiconductor fabrication plant**, focusing on **defense** and **national security**. This strategic initiative is part of India's push to reduce dependency on imports for critical technologies and boost its advanced technology capabilities.

### Firms Involved:

- **Bharat Semi** and **3rdiTech**:
  - These are **Indian start-ups** focused on designing military-specific chips. They have worked with the **Indian Armed Forces** and the **U.S. military** since 2019.
  - **Founders:** Vrinda Kapoor, Vinayak Dalmia, and Mukul Sarkar.

### India's Semiconductor Initiatives:

1. **India Semiconductor Mission (ISM):** Provides a **50% capital expenditure subsidy** for semiconductor projects to promote the development of semiconductor manufacturing.
2. **Fab Plant for National Security:** Aimed at **domestic manufacturing** of defense-related chips to reduce reliance on imports for critical technologies like **missile seekers** and **night vision devices**.
3. **Self-Reliance Initiatives:** Aligned with the **Make in India** and **Atmanirbhar Bharat** initiatives, strengthening India's role in the **global semiconductor supply chain**.

### Significance:

The establishment of a semiconductor fabrication plant focused on defense enhances India's **technological independence** and strengthens its **national security capabilities**. It also reinforces the country's ambition to become a significant player in the **global semiconductor market**, contributing to advanced sectors such as **electronics, defense, and telecommunications**.

## HISTORY & ART, CULTURE

### 100 Years of the Discovery of the Indus Valley Civilization (IVC)

**Context:** 2024 marks the **centenary** of the discovery of the **Indus Valley Civilization (IVC)**, also known as the **Harappan Civilization**. This Bronze Age civilization, first announced by **John Marshall in 1924**, spans over 2,000 sites across **India, Pakistan, and Afghanistan**. Its advanced **town planning, metallurgy, and craftsmanship** continue to intrigue researchers, although many mysteries, such as the **undeciphered script** and reasons for its **decline**, remain.

#### Key Features of the Indus Valley Civilization:

- **Time Period:** Lasted from **3300 BCE to 1300 BCE**.
- **Geographical Spread:** Covered parts of **northeast Afghanistan, Pakistan, and northwestern India**.
- **Major Rivers:** Thrived in the **Indus River basins** and rivers like the **Ghaggar-Hakra**.
- **Urban Planning:** Known for well-organized **cities, baked brick houses, and advanced drainage systems**.
- **Handicrafts and Metallurgy:** Famous for **carnelian products, seal carving, and use of copper, bronze, lead, and tin**.

#### Important Sites:

1. **Harappa** (Pakistan) – First discovered by **Daya Ram Sahni**.
2. **Mohenjo-daro** (Pakistan) – Excavated by **Rakhal Das Banerji**.
3. **Dholavira** (India) – A UNESCO World Heritage Site known for its advanced water conservation system.
4. **Lothal** (India) – Known for its dockyard and maritime trade.
5. **Kalibangan** (India) – Evidence of pre-Harappan and Harappan civilization phases.
6. **Rakhigarhi** (India) – One of the largest Harappan sites.

#### Reasons for Decline:

- **Climate Change:** Weaker monsoons led to a **reduced water supply** and the **gradual drying** of the soil, contributing to the civilization's decline.
- **Migration:** The population scattered **eastward and southward**, reorganizing from large cities to **smaller rural settlements**.
- **Drought:** A study by the **University of Cambridge** found that **droughts** lasting over **two centuries** affected food production and habitation patterns. People adapted by shifting to **drought-resilient crops** like millet.

## Influence and Lessons for Present-Day Cities from IVC:

Aspect	Influence and Lessons for Present-Day Cities
<b>City Planning</b>	Focus on <b>sustainable development</b> , <b>efficient land use</b> , and <b>robust infrastructure</b> networks, inspired by the systematic urban planning of the IVC.
<b>Sanitation Systems</b>	Modern cities can prioritize <b>well-designed sanitation systems</b> , <b>waste management</b> , and access to <b>clean water</b> , learning from IVC's advanced sanitation.
<b>Planned Neighbourhoods</b>	Promote <b>walkable neighbourhoods</b> , <b>mixed land-use planning</b> , and <b>public spaces</b> to enhance community connectivity, taking inspiration from the planned neighbourhoods of IVC cities.
<b>Cultural Diversity</b>	Encourage <b>cultural inclusivity</b> , events, and dialogue among diverse communities, similar to the <b>cultural diversity</b> of the IVC.
<b>Environmental Awareness</b>	Focus on <b>green spaces</b> , <b>sustainable transportation</b> , and <b>eco-friendly urban design</b> to address environmental challenges, inspired by IVC's awareness of environmental factors.

## Comparison Between the Indus Valley Civilization and Other Ancient Civilizations:

Aspect	Indus Valley Civilization (IVC)	Other Ancient Civilizations
<b>Urban Planning</b>	Highly advanced, with <b>grid-based city layout</b> , <b>drainage systems</b>	Egyptian and Mesopotamian civilizations had monumental structures but less systematic urban planning.
<b>Writing System</b>	Undeciphered script on <b>seals and pottery</b>	Egyptian hieroglyphics and Mesopotamian cuneiform are deciphered.
<b>Metallurgy</b>	Use of <b>copper, bronze, lead, and tin</b>	Similar advancements in metallurgy in Mesopotamia and Egypt.
<b>Cultural Artifacts</b>	Seals, <b>figurines</b> , <b>beadwork</b> , <b>pottery</b>	Egyptian pyramids, Mesopotamian ziggurats, and Greek pottery as major cultural contributions.
<b>Agriculture</b>	Irrigation from rivers like the Indus; crops like wheat and barley	Agriculture also central in Egypt (Nile) and Mesopotamia (Tigris-Euphrates).

## ENVIRONMENT & ECOLOGY

### Air Pollution: An Urgent Crisis in India

**Context:** Air quality in Delhi has once again slipped into the 'poor' category (AQI 200-300), marking the beginning of North India's bad air season. This highlights the **recurring problem** of air pollution, which continues to plague various parts of India, particularly during the winter months.

#### Air Pollution Data in India:

- Global Ranking:** According to IQAir's 2023 report, India is ranked as the **third most polluted country globally**.
- PM2.5 Concentration:** The average **PM2.5 concentration** in India stands at **54.4  $\mu\text{g}/\text{m}^3$** , far above safe limits.
- Economic Impact:** Air pollution results in an **economic loss** of ₹2.7 lakh crore annually, accounting for **1.36% of the GDP**.

#### Causes of Air Pollution:

##### Natural Causes:

- Wildfires and Dust Storms:** These natural events contribute to the spread of **particulate matter (PM)** in the atmosphere.
- Volcanic Activity:** Volcanic eruptions release gases such as **sulfur dioxide (SO<sub>2</sub>)**, affecting air quality both regionally and globally.

##### Anthropogenic Causes:

- Vehicular Emissions:** Cars and industrial transportation are significant sources of **nitrogen oxides (NO<sub>x</sub>)** and particulate matter.
- Industrial Emissions:** Factories emit **sulfur oxides (SO<sub>x</sub>)** and **carbon dioxide (CO<sub>2</sub>)**, contributing to both local air pollution and **global warming**.
- Stubble Burning:** Particularly in **Punjab, Haryana, and Uttar Pradesh**, stubble burning worsens air pollution, especially in **Delhi-NCR** during winter.
- Waste Burning:** The open burning of **solid waste** releases harmful chemicals, degrading air quality.
- Coal-based Power Plants:** These plants are responsible for over **half of India's SO<sub>2</sub> emissions** and **30% of NO<sub>x</sub> emissions**.

#### Impact of Air Pollution:

1. **Health:** Air pollution causes **respiratory problems, heart disease, and premature deaths**, with **PM2.5** being the most harmful pollutant.
2. **Environment:** It leads to **acid rain**, which damages **crops and ecosystems**, and contributes to **climate change**.
3. **Economic Loss:** According to the **World Bank**, air pollution reduces **workforce productivity**, hinders **GDP growth**, and increases **healthcare costs**.

### Measures to Control Air Pollution:

#### Technological Interventions:

1. **Air Quality Monitoring:** Enhancing infrastructure for **real-time air quality monitoring** enables early warnings and targeted actions.
2. **Emission Norms:** Strengthening and expanding **Bharat Stage VI** norms for vehicles and promoting **electric vehicles (EVs)** can significantly reduce emissions.
3. **Use of Renewable Energy:** Shifting from **coal-based power plants** to **renewable energy sources** like **solar** and **wind** will reduce harmful emissions.

#### Policy Interventions:

1. **National Clean Air Programme (NCAP):** Aims to reduce **PM2.5 levels** by 20-40% by 2026 through coordinated efforts across states and sectors.
2. **Graded Response Action Plan (GRAP):** Especially for **Delhi-NCR**, GRAP implements emergency measures during severe pollution episodes.
3. **Stubble Management Programs:** Encouraging farmers to adopt alternatives like **bio-decomposers** to reduce seasonal pollution spikes from stubble burning.

#### Community and Behavioral Changes:

1. **Public Awareness:** Campaigns on the **health impacts of air pollution** and encouraging **carpooling** and **waste segregation** can lead to better outcomes.
2. **Green Urban Spaces:** Expanding **green belts** in urban areas helps absorb pollutants and improves overall air quality.

#### Best Global Practices:

1. **Singapore's Green Plan:** Aims at achieving **net-zero emissions** through **sustainable urban planning, EV incentives**, and strong **public transportation systems**.
2. **London's Ultra-Low Emission Zone (ULEZ):** Charges vehicles that do not meet emission standards, significantly reducing pollution in the city.

## International Big Cat Alliance (IBCA)

**Context:** India became a founding member of the **International Big Cat Alliance (IBCA)**, a global initiative launched by **Prime Minister Narendra Modi** on **April 9, 2023**, marking the **50th anniversary of Project Tiger**.

### About IBCA:

- **Objective:** To conserve big cats, such as **tigers, lions, and cheetahs**, and protect their habitats.
- **Founding Members:** India, Nicaragua, Eswatini, and Somalia.
- **Headquarters:** Located in India.
- **Global Collaboration:** Involves **24 countries** and **9 organizations** working together to conserve big cats, promote sustainable resource use, and address climate challenges.

## Sustainable Aviation Fuels: Collaboration Between India and Brazil

**Context:** India and Brazil have reaffirmed their commitment to collaborate on **sustainable fuels**, focusing particularly on **biofuels** and **Sustainable Aviation Fuels (SAF)**.

### Key Points:

- As **founding members** of the **Global Biofuels Alliance**, India and Brazil emphasized the role of **biofuels** in the global **energy transition** and **socioeconomic growth**.
- Both nations are well-positioned to collaborate on **Sustainable Aviation Fuels (SAFs)** using their **biofuel infrastructure** and **agricultural resources**.
- SAFs are a type of **renewable fuel** made from **sustainable resources** like **waste oils, agricultural residues, and algae**. They can be used as an **alternative** or blended with **conventional jet fuels** to reduce the **carbon footprint** of aviation.
- India and Brazil will co-host the **India-Brazil Clean Cooking Ministerial Meeting** during **India Energy Week 2025**, focusing on improving **clean cooking access**.
- Collaboration in **deep and ultra-deep offshore energy explorations** was also discussed.

## Wildlife Habitats Development Scheme: Focus on Technological Interventions

**Context:** The **Union Cabinet** has approved the **Integrated Development of Wildlife Habitats Scheme** for the 15th Finance Commission cycle.

## Key Aspects:

- The scheme supports key initiatives like **Project Tiger**, **Project Elephant**, and **Development of Wildlife Habitat**.
- Aims to boost **technological interventions** for **wildlife monitoring**, including the use of **AI**, **camera traps**, and **conservation genetics**.
- It also supports species conservation projects like **Project Dolphin** and **Project Lion**, using advanced tools for tracking and preservation.
- The scheme benefits:
  - **55 Tiger Reserves**.
  - **33 Elephant Reserves**.
  - **718 Protected Areas**.
- These efforts contribute to **wildlife conservation** and **climate resilience**.

These developments represent significant strides in fields like **biotechnology**, **sustainable energy**, and **wildlife conservation**, showcasing India's commitment to innovation and collaboration on global challenges.

## Project Cheetah: Two-Year Review

**Context:** **Project Cheetah**, aimed at reintroducing cheetahs to India after their extinction in 1952, has completed **two years** on **September 17**. This ambitious conservation initiative involves the **translocation** of the **African cheetah** to restore the country's **grassland ecosystems** and create a viable population of cheetahs.

### Background of Project Cheetah:

1. **Cheetah Extinction in India:** Cheetahs were officially declared **extinct in India in 1952** due to **overhunting** and **habitat loss**.
2. **Goal of Reintroduction:** To establish a **viable population** of cheetahs in **central India**, thereby restoring the **grassland** and **savannah ecosystems**.
3. **Translocation from Africa:** The first batch of **8 cheetahs** arrived from **Namibia** in 2022, followed by **12 cheetahs** from **South Africa** in early 2023.
4. **Cheetah Breeding and Expansion:** Aimed at promoting **breeding** and establishing a **metapopulation** across various **wildlife reserves**.

5. **Ecosystem Restoration:** Cheetahs are considered **umbrella species** for restoring **open ecosystems**, benefiting other species dependent on grasslands.

### Analysis of Two Years of Performance:

#### Positives:

1. **Successful Translocation:** **24 cheetahs**, including cubs, have survived the initial translocation and **acclimatization** to India's environment.
2. **Breeding Success:** **17 cubs** have been born within two years, demonstrating the potential for **population expansion**.
3. **Adaptive Movements:** Cheetahs like **Veera** have shown **wide-ranging movements**, indicating their potential to **adapt** to free-range life.
4. **Multi-location Translocation:** Plans to expand the project to **Gandhi Sagar Wildlife Sanctuary** are underway, allowing the population to spread across multiple locations.

#### Challenges:

1. **High Mortality Rate:** **8 cheetahs** (40% of translocated adults) and **5 cubs** (29%) have died due to factors like **infection, mating injuries, and environmental stress**.
2. **Limited Wild Release:** Most cheetahs are still in **enclosures**, raising concerns about their ability to **thrive independently** in the wild.
3. **Prey Deficit:** Declining prey populations, especially **chital**, pose a significant challenge to supporting both **cheetahs and leopards** in **Kuno National Park**.
4. **Interstate Coordination:** The **movement of cheetahs across state borders** highlights the need for a **landscape-level conservation strategy** and better **interstate cooperation**.

#### Way Ahead:

1. **Prey Base Augmentation:** Immediate efforts are needed to **increase prey density** in both **Kuno** and **Gandhi Sagar** wildlife sanctuaries to support the growing cheetah population.
2. **Habitat Restoration:** Focus should be placed on **restoring and protecting grasslands** and savannahs across multiple districts and states, ensuring adequate habitat for cheetahs.
3. **Gradual Wild Release:** Post-monsoon wild release plans must be carefully executed to ensure that cheetahs can **adapt to free-range habitats**.
4. **Transparent Project Management:** **Improved communication** with experts and the public is essential for addressing challenges and ensuring **long-term success**.

## SCIENCE & TECHNOLOGY

### Nanozymes: A Breakthrough in Collagen Stability

**Context:** A study by **CSIR-Central Leather Research Institute (CSIR-CLRI)** has demonstrated the potential of **nanozymes** to improve **collagen stability** and resistance to enzymatic degradation.

#### Key Insights:

- **Nanozymes** are **nanomaterials** that mimic the activity of enzymes.
- Traditional collagen crosslinking methods involve **harsh chemicals** that may damage the protein structure, but nanozymes work under **mild conditions**, preserving collagen integrity.
- The study focused on a **manganese-based nanozyme** that enhances collagen stability through a **tannic acid-tyrosine linkage**, making it resistant to **collagenase** (an enzyme that degrades collagen).
- This breakthrough has significant implications for **wound healing**, **tissue engineering**, and the development of durable **collagen-based biomaterials**.
- Another study explored **biomolecule interactions** with **enzyme-like catalytic sites** in **metal-organic frameworks (MOFs)**, offering potential for more precise **artificial enzymes** in medical applications.

### Computer security incident response team – power (csirt–power)

**Context:** The **Union Minister** inaugurated the **COMPUTER SECURITY INCIDENT RESPONSE TEAM – POWER (CSIRT–POWER)**, a facility focused on protecting India's **power infrastructure** from growing **cyber threats**. This proactive initiative aims to strengthen cybersecurity in one of the nation's most critical sectors.

#### Key Features of CSIRT–POWER:

1. **Objective:** Protect the **power sector** from increasing cyberattacks, ensuring the safety and resilience of this **critical national infrastructure**.
2. **Cybersecurity Tools and Expertise:** Equipped with **advanced cybersecurity tools** and a team of experts, CSIRT–POWER will **coordinate incident responses**, improve **preparedness**, and bolster the overall **cybersecurity framework** for the power sector.
3. **Focus on Sector Vulnerabilities:** With the **digital transformation** in the power industry, the **attack surface** has expanded. CSIRT–POWER addresses **vulnerabilities** and works to mitigate potential cyber risks.

4. **Policy Alignment:** The initiative aligns with the **National Cyber Security Policy of 2013**, focusing on **building resilience** through **information sharing, best practices, training, and collaboration** with relevant stakeholders.
5. **Specialized Support:** CSIRT–POWER provides **specialized cybersecurity support, prevents cyber incidents**, and enhances the **security posture** of the power sector.

### Significance:

The establishment of CSIRT–POWER is crucial in the context of increasing **cyberattacks** on national infrastructure. By providing a **coordinated response system**, enhancing **cyber preparedness**, and fostering collaboration across the sector, this facility plays a pivotal role in ensuring the **cybersecurity and operational resilience** of India's **power infrastructure**.

This initiative strengthens India's position in **cyber defense**, especially for critical sectors like **energy**, making it a key component of **national security and sustainable development**.

## GlobE Network

**Context:** India has been elected to the fifteen-member **steering committee** of the **Global Operational Network of Anti-Corruption Law Enforcement Authorities (GlobE Network)**, an international initiative focused on addressing **corruption and financial crime**.

### About the GlobE Network:

1. **Origin:** Launched in **June 2021** under the **G20 framework** during the **UN General Assembly Special Session against Corruption (UNGASS)**.
2. **Membership:** Currently includes **121 member countries** and **219 authorities** worldwide.
3. **Aim:** To **facilitate international cooperation** in combating **cross-border corruption and financial crime**.
  - Supports **asset recovery** efforts by enhancing global collaboration.
4. **Powers:** Enables global agencies to **exchange criminal intelligence, best practices**, and devise **joint strategies** to fight corruption.
5. **Significance of India's Election:** India's election to the steering committee enhances its role in **global anti-corruption efforts**.
  - Leverages India's **expertise in tackling corruption**, while also building on its leadership after the **G20 Presidency in 2023**.

## First Mission to Venus: ISRO's Next Interplanetary Ambition

**Context:** The **Union Cabinet** has approved **India's first mission to Venus**, planned by **ISRO** for **March 2028**. This will be **India's second interplanetary mission** after the successful **Mars Orbiter Mission** in 2013.

### Features and Roadmap:

1. **Launch Date:** **March 2028** is the scheduled launch date for India's first mission to **Venus**.
2. **Mission Objectives:** The mission aims to study Venus' **surface, sub-surface, atmosphere, ionosphere**, and its interaction with the **Sun**.
3. **Scientific Payloads:** Includes **L and S band Synthetic Aperture Radar**, a **thermal camera**, and experiments to study **interplanetary dust** and **high-energy particles**.
4. **Aero-Braking:** The mission will use **aero-braking** to gradually lower the satellite's orbit around Venus by using the planet's atmosphere to **slow down** and achieve the desired altitude.

### Significance:

1. **Insights into Venus:** The mission will provide crucial data about **Venus**, offering insights into **Earth's evolution**, particularly in terms of **atmospheric** and **climate changes**.
2. **Strengthening India's Space Exploration:** Marks India's **second interplanetary mission**, solidifying its position in **global space exploration** and showcasing ISRO's expanding capabilities.

## PARAM Rudra Supercomputers: Boosting India's Scientific Research

**Context:** The Prime Minister inaugurated three **PARAM Rudra supercomputers**, under the **National Supercomputing Mission (NSM)**, deployed in **Pune, Delhi, and Kolkata**. These supercomputers are worth ₹130 crore and are designed to advance research in fields like **physics, cosmology, earth sciences**, and **weather prediction**.

### Significance:

1. **Advancing Research:** PARAM Rudra supercomputers will **propel India's scientific research capabilities**, making **cutting-edge technology** accessible to young scientists.
2. **Diverse Applications:** They will assist in areas like **disaster management, industrial growth**, and **agriculture** (for **weather** and **soil analysis**).
  - They are crucial in boosting India's **national capability in science and technology**.
3. **Self-reliance in Technology:** These supercomputers align with India's strategy toward **self-reliance** and **leadership in Industry 4.0**.

### Supercomputers in India:

1. **Origin:** India began focusing on **supercomputing** in 1987 after being denied the purchase of a **Cray X-MP** by the USA, leading to the development of **indigenous supercomputers**.
2. **Major Indian Supercomputers:**
  - **PARAM Series** (developed by **C-DAC**): Includes **PARAM Siddhi AI**, **PARAM Pravega**, **PARAM Utkarsh**, and **PARAM Shivay**.
  - **Pratyush** and **Mihir** (for weather forecasting), and **AI Supercomputer AIRAWAT** (ranked 75th globally in 2023).
3. **Applications:** Utilized for **weather forecasting**, **genomic sequencing**, **space exploration**, **aviation engineering**, **defense applications**, and **oil & gas exploration**.
4. **Significance:** Supercomputers drive **innovation**, **research**, and are critical in areas like **artificial intelligence**, **quantum computing**, and **national security**, positioning India as a **global leader in technology**.

## PLACES IN NEWS

### Lebanon: Key Facts and Geographical Overview

**Context:** Recent conflict between **Israel** and **Hezbollah** has escalated, with Israeli strikes targeting **Hezbollah weapons** and **rocket launchers** in Lebanon. According to Lebanese health officials, these attacks have resulted in the deaths of more than **600 people**, including many **women** and **children**.

#### Key Geographical Features:

##### 1. Mountain Ranges:

- **Mount Lebanon Range:** Runs parallel to the **Mediterranean coast**, forming the spine of the country.
- **Anti-Lebanon Range:** Forms the **eastern boundary** of Lebanon, shared with **Syria**.

##### 2. River:

- **Litani River:** Lebanon's longest river, flowing entirely within the country, it is



significant for **irrigation** and **hydroelectric power**.

### Important Cities in Lebanon:

1. **Beirut: Capital** and largest city of Lebanon, located on the **Mediterranean coast**.
  - An important hub for **commerce, culture, and politics**.
2. **Tripoli:** Major city in the **north**, known for its **trade** and **industrial** significance.
3. **Sidon:** A historic city in the **south**, noted for its ancient **port** and **maritime activities**.
4. **Tyre:** An **ancient city** on the southern coast, designated as a **UNESCO World Heritage site**.
5. **Zahle:** A key city in the **Beqaa Valley**, known for its importance in **agriculture**.

### Neighbouring Nations:

1. **Syria:** Lies to the **north** and **east** of Lebanon, sharing a long border and deep historical ties.
2. **Israel:** Borders Lebanon to the **south**, with tensions between the two nations often leading to conflicts.
3. **Mediterranean Sea:** Forms Lebanon's **western boundary**, giving it access to important **maritime routes** and trade links.

## Vizhinjam International Seaport

**Context:** The **Mediterranean Shipping Company's** vessel **Anna**, one of the world's largest container ships, recently berthed at the **Vizhinjam International Seaport** in Thiruvananthapuram, Kerala.

### About Vizhinjam International Seaport:

1. **Location:** The port is located in **Thiruvananthapuram, Kerala**.
2. **Significance:** It is **India's first deep-water container transshipment port**, currently under a **trial run** since July 2024.
  - The port is designed to be a **multi-purpose, all-weather, and green port**.
  - It is set to become **India's first automated port** and holds a unique position as the only Indian port directly adjacent to an **international shipping lane**.



## Thailand

**Context:** Thailand has become a key player in Southeast Asia, not only for its strategic geographic location and economic significance but also for its progressive social policies. Recently, Thailand became the **first Southeast Asian country to legalize same-sex marriage**, marking a significant milestone in the region for LGBTQ+ rights.

### Political Features:

1. **Capital:** Bangkok.

2. **Geopolitical Location:**

- Thailand is located at the **center of mainland Southeast Asia** and is a **founding member of ASEAN** (Association of Southeast Asian Nations), playing an essential role in regional cooperation.



3. **Bordering Countries:**

- **Myanmar** to the west,
- **Laos** to the north and east,
- **Cambodia** to the southeast,
- **Malaysia** to the south.

4. **Bordering Water Bodies:**

- **Gulf of Thailand** to the southeast,
- **Andaman Sea** to the southwest.

### Geographical Features:

1. **Highest Peak:** **Doi Inthanon** is the highest peak in Thailand, located in the northern region.
2. **Major Rivers:** The **Chao Phraya River** runs through central Thailand and is vital for agriculture, transport, and water supply.
  - The **Mekong River** forms part of Thailand's border with Laos and is a crucial waterway in the region.
3. **Kra Isthmus:** The **Kra Isthmus** is a narrow strip of land that connects the **Malay Peninsula** with the Asian mainland, a strategic location for transportation and trade.
4. **Natural Resources:** Thailand is the **world's largest producer of natural rubber**, contributing significantly to its economy.

## Trinidad & Tobago

**Context:** Trinidad & Tobago recently made headlines by becoming the **first country in the Caribbean region** to adopt India's **Unified Payments Interface (UPI) platform**, showcasing its openness to digital financial advancements. The country, located in the southeastern West Indies, holds geopolitical significance in the Caribbean and is known for its rich natural resources.

### Political Features:

1. **Capital:** Port of Spain.
2. **Geographical Location:** An island country situated in the **southeastern West Indies**, surrounded by the **Atlantic Ocean**.
  - It lies close to the continent of **South America**, northeast of **Venezuela** and northwest of **Guyana**.
3. **UPI Platform Adoption:** Trinidad & Tobago is the **first Caribbean nation** to adopt India's **UPI platform**, signifying a leap in digital payment infrastructure in the region.



### Geographical Features:

1. **Mountain Ranges:** **Northern Range:** A continuation of the **coastal ranges of the Andes Mountains** in Venezuela, located in the northern part of Trinidad.
2. **Natural Resource:** **Pitch Lake** in Trinidad is the **world's largest natural reservoir of asphalt**, an important resource used globally for road construction.
3. **Highest Point:** **Mount Aripo:** The highest point in Trinidad, located in the Northern Range.
4. **Major Rivers:** **Ortoire River** and **Caroni River** are two of the main rivers flowing through Trinidad, essential for agriculture and the country's ecosystem.