

1. World's first particulate matter trading scheme: A recent study led by Michael Greenstone, found that the Surat Emission Trading Scheme (ETS) launched in Gujarat in 2019 cut particulate matter pollution by 20–30% while also reducing compliance costs for industries.

- **About Particulate Matter:** It composed of microscopic solids or liquid droplets that can be inhaled.

- Particles under 10 micrometers can reach the lungs and bloodstream, causing serious health problems.

- **About World's First Particulate Matter Trading Scheme:** Introduced in 2019 in Surat, Gujarat.

- **Objective:** Aimed to curb air pollution by trading permits for particulate matter emissions.

- **Collaboration:** Launched with University of Chicago, Yale University, and J-PAL.

- **Global First:** Recognised as the world's first particulate matter emissions market.

- **Mechanism:** Allowed industries to buy/sell permits to stay within emission caps.

- **Global Comparison:** Similar to cap-and-trade systems in Europe (greenhouse gases) and China (carbon emissions).

- **About Surat Emission Trading Scheme (ETS):** Run by GPCB (Gujarat Pollution Control Board) with EPIC, J-PAL, and industry groups.

- **Pollution Cap:** Each plant was given a pollution limit and could trade permits to meet it.

- **Trading Platform:** Permits were traded via NeML platform.

- **Penalty:** Fines were imposed on plants failing to comply with permit norms.

- **Emission Reduction:** ETS plants cut particulate emissions by 20–30%.



2. Kalam & Kavach 2.0: The Centre for Joint Warfare Studies (CENJOWS), under HQ IDS, Ministry of Defence, in collaboration with Pentagon Press, hosted the second edition of the Defence Literature Festival 'Kalam & Kavach 2.0'.

- **Theme:** 'Securing India's Rise through Defence Reforms'

- **About Kalam & Kavach 2.0:** It is a platform for strategic dialogue on national defence and policy reforms, focused on Defence Technology and Future Warfare, particularly in the context of defence manufacturing - 'Aatmanirbhar Bharat' (Self-reliant India).

- **Technological Adoption:** Covered the progress on adoption of niche technologies & enhancing multi-domain & cross-domain operational capabilities in land, air, sea, cyber, & space.
- **Maritime Security:** The agenda included contemporary maritime security paradigms, future challenges, and strategies to enhance combat capability.
- **Declaration:** India declared 2025 as the 'Year of Reforms', aiming to make the Armed Forces technologically advanced and combat-ready.
- **Vision:** This vision emphasised multi-domain integrated operations, a mission-mode approach to defence reforms, technology transfer, and strengthening public-private partnerships.

3. QpiAI-Indus: Bengaluru-based QpiAI, one of the 8 startups selected under the National Quantum Mission coordinated by the Department of Science and Technology (DST), announced the launch of one of India's most powerful quantum computers featuring 25 superconducting qubits, on World Quantum Day.

- **About QpiAI-Indus:** It is the first full-stack quantum computing system in the country.
 - **Features:** It combines advanced quantum hardware, scalable control, and optimized software for transformative hybrid computing.
 - **Technological Integration:** It integrates advanced quantum processors, next-generation Quantum-HPC software platforms, and AI-enhanced quantum solutions.
 - **Innovation Focus:** Driving **deep-science** and **deep-tech innovation** across life sciences, drug discovery, materials sciences, mobility, logistics, sustainability, and climate action.
- **About:** Quantum computers are machines that leverage the principles of quantum physics, particularly superposition and entanglement, to perform calculations.
 - **Difference from Classical Computers:** Unlike classical computers that use bits (0 or 1), quantum computers use qubits, which can exist in a combination of 0 and 1 simultaneously, enabling them to explore many possibilities at once.
 - **Capability:** This allows them to tackle complex problems that are intractable for classical computers, potentially leading to breakthroughs in various fields.
- **About National Quantum Mission (NQM):** Launched by the Department of Science & Technology, the mission aims to harness quantum physics for next-generation communication and sensing systems.

- 4. Operation Chakra-V:** The CBI has arrested four people under 'Operation Chakra V' for their alleged involvement in 'Digital Arrests' fraud.
- **About Operation Chakra V:** Aims to crack down on cybercrime networks and tracking digital fraudsters.
 - It involved searches across multiple states including Uttar Pradesh, Maharashtra, Rajasthan, and West Bengal.
 - **About Central Bureau of Investigation (CBI):** It is the premier investigative agency of India, established in 1963 by the Indian government as a result of the recommendation of the Santhanam Committee.
 - **Statutory Status:** CBI is **not a statutory body**. It derives its power to investigate from the Delhi Special Police Establishment Act, 1946.
 - **Administrative Control:** It operates under the Ministry of Personnel, Public Grievances and Pensions, which in turn functions under the PMO.
 - **Special Supervision:** For investigation under the Prevention of Corruption Act, CBI vests superintendence to the Central Vigilance Commission.
 - **Functions:** Initially, it was set up to investigate corruption in government departments and public sector undertakings.
 - **Expanded Jurisdiction:** Covers economic offenses, cyber-crimes, organized crimes & special crimes.
- 5. Mantis Shrimp:** Researchers from the US and France found that the mantis shrimp uses a unique microstructure in its dactyl club to protect itself from recoil during high-speed strikes.
- Study revealed the phenomenon of phononic shielding using ultrafast lasers and simulations, showing nature's use of metamaterials.
 - **About:** Mantis shrimp is a 10-cm-long crustacean predator with a colourful body.
 - **Dactyl club** strikes prey at 23 m/s, 50-times faster than a blink. **Strike** generates shockwaves, but the shrimp remains unharmed.



- Microstructure in the club enables phononic shielding, blunting acoustic waves.
- Lasers revealed the club's response at billionth-of-a-second intervals.
- Club stores energy in spring-like structures and releases it via latch-like tendons.
- Punch forms low-pressure zones, creating vapour bubbles.
- Bubbles collapse to release heat and high-frequency shockwaves.
- **Layers Comprises:** Outer layer is hard hydroxyapatite, distributing recoil & Inner layers have biopolymer fibres for impact resistance.
- **Applications:** Include protective gear, earmuffs, and injury prevention.
- **Researchers** are exploring **biomimetic structures** for **wave trapping** and **energy conversion**.

6. PM-Vidyalaxmi Scheme: Recently, the Public Sector Banks (PSBs) have raised concerns regarding the slow uptake and implementation issues of the PM Vidyalakshmi Scheme.

- **About PM Vidyalakshmi Scheme:** It is central sector scheme providing financial support for meritorious students pursuing higher education.
 - Launched and managed under the **Ministry of Education** specifically through the **Department of Higher Education**.
- **Eligibility:** Applicable to students admitted to any of 860 Quality Higher Education Institutions (QHEIs) (govt. or private) ranked by NIRF.
 - Students receiving other scholarships, interest subventions, or fee reimbursements are not eligible.
 - Students who drop out or are dismissed on disciplinary/academic grounds are not eligible for interest subvention or credit guarantee.
- **Loan Application:** Loans can be applied for through the PM-Vidyalakshmi portal, integrated with multiple banks for a digital and seamless experience.
- **Loan Amount:** No upper limit on the loan amount. Loan depends on course fees, hostel/mess fees, other institutional fees, laptop cost, and living expenses.
- **Interest Subvention:** Students with annual family income up to ₹8 lakhs are eligible for 3% interest subvention on education loans up to ₹10 lakhs.
- **Credit Guarantee:** For loans up to ₹7.5 lakhs, credit guarantee covers 75% of outstanding default, regardless of family income.

7. **Cheetah Relocation:** Cheetah Project Steering Committee has recently approved relocation of cheetahs from Kuno National Park to Gandhi Sagar Wildlife Sanctuary, Madhya Pradesh.

• **About Cheetah Relocation:**

- **Steering Committee:** Set up by NTCA in May 2023 to monitor and advise the cheetah reintroduction program.
- **Project Cheetah:** Launched in 2022 with 8 cheetahs from Namibia and 12 from South Africa brought to Kuno.
- **New Site:** Gandhi Sagar Wildlife Sanctuary identified to support a meta-population of 60–70 cheetahs across Kuno–Gandhi Sagar landscape (Madhya Pradesh–Rajasthan).
- **Prey Base at Gandhi Sagar:** Includes chinkara, chousingha, nilgai, and chital.



• **About Cheetahs:**

- **Breeding:** Year-round; peak in rainy season & **Maturity:** Females – 20–24 months; Males – 24–30 months.
 - **Gestation:** Around 90–95 days, with 3–5 cubs per litter & **Communication:** No roar; use chirps, barks, and stutter barks.
 - **Speed:** Fastest land animal, up to 120 km/h, accelerates 0–100 km/h in 3 seconds, uses tripping with semi-retractable claws; success rate 40–50%.
- **Protection Status of Cheetahs:** Listed as Vulnerable under IUCN Red List.
- **Wild Life (Protection) Act, 1972:** Listed in Schedule II.
 - **CITES:** Included in Appendix I (highest trade protection).

8. **Sir Sankaran Nair:** Recently, the Prime Minister paid tribute to Sir Sankaran Nair, on 106th anniversary of the Jallianwala Bagh massacre.

- **About Sir Sankaran Nair:** Known for moral courage, strong convictions, and opposition to British colonialism, played a key role in Montagu-Chelmsford Reforms (1919) – introduced dyarchy and increased Indian participation in administration.
- **Defamation Trial against Michael O'Dwyer:** In his book, accused O'Dwyer (Lt. Governor of Punjab) of responsibility for Jallianwala due to **repressive policies**.
- Legacy preserved through the book "**The Case That Shook the Empire**" and films like **Kesari Chapter 2**.