

## A Major Breakthrough Achieved by Indian Scientists in Sodium-Ion Battery

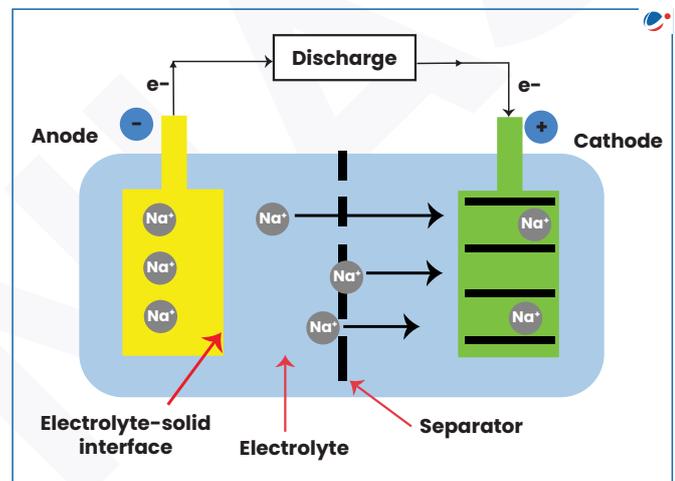
Research team working under Department of Science and Technology has developed a **super-fast charging sodium-ion battery (SIB)** that can charge up to **80% in just six minutes** and last over **3000 charge cycles**.

### About Sodium-Ion Battery (SIB)

- **Definition:** SIBs are a **type of rechargeable battery** similar to lithium batteries, but carry the charge using sodium ions (Na+) instead of lithium ions (Li+).
- **How Sodium-Ion Batteries (SIBs) Work?**
  - ⊕ **During discharge:** Sodium ions move from **anode** (negative electrode) to **cathode** (positive electrode), which hosts ions and undergoes **reduction**.
  - ⊕ **These ions travel through an electrolyte** (an electrical conductor) that enables the flow of current by creating a potential difference.
  - ⊕ **During Recharge:** Sodium ions return to the anode.

### Advantages of Sodium-Ion Batteries (SIBs) Compared to Lithium-Ion Batteries (LIBs):

- **Cost:** SIBs are cost-competitive (overall costs could be 15%-20% lower) than LIBs since sodium compounds are cheaper than lithium equivalents.
- **Supply chain decentralisation:** Sodium's abundance enables diverse global manufacturing, reducing geopolitical risks.
  - ⊕ **E.g.,** As of 2023, China accounted for **nearly 60% of global lithium processing**, highlighting the current concentration in lithium supply chains that SIBs can help diversify.
- **Technology:** SIBs have a better range of operational temperatures than LIBs, allowing them to be safely deployed in areas with greater temperature variation.
- **Safety:** SIBs can be transported at zero voltage (fully discharged), reducing fire risks and costly safety measures compared to LIBs.



## Women entrepreneurs can boost global GDP by \$5 trillion: Report

Report by **Cherie Blair Foundation for Women** emphasizes that Women entrepreneurs are **critical drivers of economic growth and poverty reduction** in low- and middle-income countries.

- If women were able to **participate equally as entrepreneurs to men**, global GDP could be boosted by as much as \$5 trillion – about the **size of Japan's economy**.
- Despite the **significant ownership of the businesses** (50% in Latin America, 44% in East Asia), women entrepreneurs face **systemic challenges that hinder their business success**.

### Key Challenges Faced by women entrepreneurs

- **Finance Access:** High borrowing costs, strict collateral requirements, and limited financial literacy block business growth capital.
- **Registration Barriers:** High costs and complex bureaucracy prevent formal business registration.
- **Internet Gap:** While 92% of women entrepreneurs in LMICs surveyed own a personal smartphone, 45% lack regular internet access due to high data costs and unreliable connectivity.
- **Online Safety Barriers:** report finds that 57% of surveyed women entrepreneurs have experienced some form of online harassment.
- **E-commerce Limitations:** Less use of e-commerce platforms due to high costs, payment distrust, and complex onboarding.

**Mobility Restrictions:** Women need accompaniment, special arrangements and some also have to deal with time restrictions due to safety concerns.

### KEY RECOMMENDATIONS FOR GENDER EQUALITY

 <p><b>Digital Access</b></p> <p>Expand affordable internet, digital literacy &amp; AI training to close gender digital divide</p>	 <p><b>Business Formalization</b></p> <p>Streamline registration &amp; remove barriers</p>	 <p><b>Legal Protection</b></p> <p>Strengthen laws against gender-based violence with enhanced reporting systems</p>	 <p><b>Financial Inclusion</b></p> <p>Enhance mobile money &amp; digital payment options for greater access</p>	 <p><b>Online Safety</b></p> <p>Use human &amp; AI moderation tools to combat harassment</p>
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## The United States President Signs Take It Down Act into Law

The **Take It Down Act** criminalises non-consensual sharing of intimate images, including **AI deepfakes**, and requires platforms to remove such content within **48 hours**.

- Victims of explicit deepfakes will now be able to take legal action against people who create them.

### About Deepfakes

- Definition:** They're synthetic media (videos, audio, or images) generated using deep learning algorithms to create realistic digital media. The term combines "deep learning" & "fake" (manipulate a person's face, voice, etc.)
  - Deep learning:** A subset of machine learning that uses multilayered neural networks to simulate the complex decision-making power of the human brain.

### Threats Posed by Deepfakes

- Deepfakes can be used to impersonate executives, tricking companies into transferring funds.
- Create fake videos of political leaders to spread misinformation.
  - E.g., In Gabon, a deepfake video of the president raised suspicions of a coup.
- Proliferation of deepfakes erodes trust in Media & create doubt about the authenticity of legitimate video content, thereby, weakening public trust.

### How to Determine if Something Is a Deepfake?

- Facial Inconsistencies:** Deepfakes often struggle with certain facial expressions, lighting, and micro-movements.
  - For instance, the eyes in a deepfake video may not blink naturally.
- Unnatural Movements:** They sometimes exhibit awkward movement. E.g., jerky head turns.
- Distortions:** They often show blurring, especially during fast movements.

### Initiatives to Tackle Deepfakes in India

- Legal Provisions under The Information Technology Act, 2000**
  - Section 66E:** Penalizes capture or transmission of images violating privacy.
  - Section 66D:** Punishes impersonation or cheating using digital means.
  - Sections 67, 67A, 67B:** Address obscene or sexually explicit deepfake content.
- Regulatory Measures:** An online platform will assist victims in filing FIRs for deepfake crimes.
- Platform Accountability:** Social media platforms are advised under Section 66D to remove deepfakes promptly or risk losing legal protections.

## Resilient Defense Supply Chains vital to achieve the goal of Viksit Bharat 2047: NITI Aayog Paper

In recent years, geopolitical tensions, global supply chain crises, and cybersecurity threats have highlighted the vulnerabilities of defense logistics.

- The Paper suggests reforms to mitigate vulnerabilities in the defense supply chain and achieve indigenous defense production targets of ₹3 lakh crore by 2029.

### Status of Defense Production in India:

- Indigenous Defence Production:** India's annual defence production stood at ₹1,27,000 crore in 2023-24, an increase of 174% from 2014-15.
- Defense Export:** Surged to an all-time high of over 23,000 crore rupees in 2024-25.
- Private Sector Participation:** The private sector contributed Rs 15,233 crore in defence exports of 2024-25.

### Policy Recommendations

- Public-private partnerships (PPPs):**
  - Outsourcing** Repairs and Maintenance, Public-Private Collaboration in R&D
  - Government-Owned, Corporate-Operated (Go-Co) Model** (private companies to use defence land for industrial purposes)
  - Incentivising MSMEs, Streamlining Procurement and reducing regulatory delays.
- Cybersecurity strategies:**
  - Creating **Blockchain-Based Security Frameworks** based on national-level blockchain security standards for defence supply chains.
  - Introducing cybersecurity audits, centralized threat intelligence platforms, smart contracts in procurement, etc.
- Legal and Policy Reforms:** Defence laws can be amended to bolster domestic manufacturing, enhance cybersecurity, and address geopolitical risks. E.g. **Defence of India Act (1962)**
- International defence cooperation:** Strengthened through technology transfers, strategic alliances (E.g. US, Russia, Israel), strategic supplier diversification etc.

### Strategic Challenges and Vulnerabilities in Defence Supply Chains

**Import Dependence and Geopolitical risks:** Defence supply chains rely on foreign suppliers for critical defence components. This may be disrupted due to geopolitical tensions, trade embargoes etc.

**Cybersecurity Threats:** Supply chain sabotage through cyber espionage, data breaches etc. may compromise sensitive military information.

**Modernization Challenges:** Rapid advancements in defence technologies results in technological obsolescence, impacting operational efficiency.

**Others:** Inefficient Procurement Policy and inventory management, Financial and Budget constraints, environmental challenges, lack of human capital development and skilling etc.

## Government e Marketplace (GeM) Portal Celebrates 8<sup>th</sup> Incorporation Day

On this occasion, GeM also launched **GeMAI**, India's first generative AI-powered chatbot in the public sector.

### Transformative Impact of GeM on Inclusive Economic Growth & Digital governance

- **Scale:** Connects 1.6 lakh government buyers with 23 lakh sellers/service providers, enabling transactions worth over ₹13.4 lakh crore since inception.
- **Cost Savings:** World Bank and Economic Survey report ~10% savings in government procurement. Also, 97% of transactions are now **charge-free**.
- **GeM has successfully integrated diverse stakeholder groups:** E.g., 10 lakh+ Micro and Small Enterprises (MSEs); 1.3 lakh artisans and weavers; ~1.8 lakh women entrepreneurs & 31,000 startups
- **Boosted Inclusive Procurement through Dedicated Storefronts**
  - ⊕ **Enhanced Visibility and Participation:** Storefronts like **Startup Runway** and **Womaniya** have significantly improved access for startups, MSEs, and women-led enterprises.
  - ⊕ **Exceeding Procurement Targets:** GeM has surpassed government targets with **38% of business awarded to MSEs** (target: 25%) and **nearly 4% to women-led businesses** (target: 3%).
- **Empowered Marginalized Entrepreneurs**
  - ⊕ **Inclusive Procurement for SC/ST MSMEs:** Actively collaborating with the MSME ecosystem to enhance participation of Scheduled Caste (SC) and Scheduled Tribe (ST) entrepreneurs in public procurement.
  - ⊕ **The SARAS Collection** on GeM features a curated range of handcrafted products by India's top Self-Help Groups (SHGs).
- **GeM's Global Standing:** On track to become the world's largest public procurement portal, surpassing platforms like South Korea's KONEPS.

### About GeM Portal

- **Launched:** In 2016 by the **Ministry of Commerce and Industry**.
- **Aim:** It is a dedicated **digital e-commerce portal for mandatory procurement and sale of goods and services** by Central and State Government Organisations/ Departments/PSUs.
- **Objective:** GeM seeks to establish a **transparent, efficient, and inclusive procurement ecosystem**, replacing the traditional Directorate General of Supplies and Disposals (DGS&D).
- **Other Features**
  - ⊕ **Automated rule-based enforcement** of MSE provisions.
  - ⊕ **Advanced analytics** for decision support, fraud, and anomaly detection.
  - ⊕ **Faceless, transparent procurement process** concealing seller identity.



### Also In News



#### K. Veeraswami vs Union of India and Others (1991)

Recently, in the context of recovery of cash from a judge's house, the **Vice President** opined the need to revisit **K. Veeraswami vs Union of India and Others (1991)** judgement.

#### About the judgement

- The Supreme Court held that a **judge** of any court is a **public servant** under **Section 2** of the **Prevention of Corruption Act, 1988**.
- **Upholding independence of Judiciary:**
  - ⊕ On a complaint filed, **prior consultation of the Chief Justice of India (CJI)** by the **President** is required before a **criminal complaint (FIR)** is 'registered' against a judge or Chief Justice of a High Court or a judge of the Supreme Court.
  - ⊕ In case of a complaint against the CJI, the Government shall **consult any other judge or Judges of the Supreme Court**.



#### Operation Olivia

Operation Olivia has shielded over **8-lakh olive Ridley turtles** on Odisha's **Gahirmatha coast**.

#### About Operation Olivia

- **Initiated:** In **1980s**, by the **Indian Coast Guard** & it is conducted every year from **November to May**.
- **The operation focuses on:** **Gahirmatha Beach, Rushikulya River Mouth, and Devi River Mouth**.
- These coastal zones witness the arrival of over **800,000 Olive Ridley turtles annually** for mass nesting called **arribada**.

#### About Olive Ridley

- It has a circumtropical distribution, with nesting occurring throughout tropical waters (**except the Gulf of Mexico**).
- **IUCN Status: Vulnerable; CITES: Appendix I.**

**Official Secrets Act (OSA), 1923**

A YouTuber has been charged for **spying for Pakistan** under Sections 3 (Spying) and 5 (Wrongful communication of information) of **Official Secrets Act, 1923**; and **Section 152 of Bharatiya Nyaya Sanhita (BNS)**.

➤ **Section 152 of BNS:** Acts endangering sovereignty, unity and integrity of India shall be punished with imprisonment.

**About OSA, 1923**

- **Objective:** To counter espionage and safeguard sensitive information related to national security.
- **Scope:** Applies to **all Indian citizens**, including **government servants**, both **within and outside** the country.
- **Offences:** Criminalises spying, unauthorised sharing of confidential government information, and **withholding of sensitive data** that could potentially threaten **safety or interests of state** etc.

**Euthalia Malaccana Butterfly**

A **new butterfly species (Euthalia Malaccana)** has been found for the first time in India in the state of **Arunachal Pradesh**.

**About Euthalia Malaccana**

- It is found in the **Indo-Australian region**, primarily in **Southeast Asia**, with records from **northern Thailand, the Malay Peninsula, and the Sunda Islands**.
- The species is characterised by a **blue apical spot on the forewings**, which is prominent in males, while **females display larger apical spots**.  
⊕ The **hindwings** are adorned with **reduced red spots**.
- Its presence serves as an **important indicator of ecosystem health**.

**Alternative Investment Funds (AIFs)**

RBI has revised the rules for investment in **Alternative Investment Funds**.

**About AIFs**

- Any fund incorporated in India which is a **privately pooled investment vehicle** which collects funds from **sophisticated investors, whether Indian or foreign**, for investing it in accordance with a defined investment policy for the benefit of its investors.
- AIFs are regulated by the SEBI, as per the **SEBI (Alternative Investment Funds) Regulations, 2012**.

**Categories of AIFs**

- **Category I AIF:** Invest in start-ups, early-stage ventures or sectors considered **socially or economically beneficial**.  
⊕ Eg. Venture Capital Funds, Angel funds, SME Funds, Infrastructure Funds
- **Category II AIF:** They do not use **leverage or debts other than to cover their day-to-day operational expenses**.  
⊕ Eg. Private Equity Funds, Debt Funds, Real Estate Funds.
- **Category III AIF:** It may use **leverage including through investment in listed or unlisted derivatives**.  
⊕ Eg. Hedge Funds, Private investment in public equity(PIPE)

**e-Zero FIR**

MHA's **Indian Cybercrime Coordination Centre (I4C)** has introduced the **new e-Zero FIR initiative**.

**About e-Zero FIR**

- Launched as a **pilot project for Delhi**.
- It intends to ease reporting and **prompt action on complaints related to cyber financial crimes**.
- Complaints related to financial losses above the threshold limit of **₹10 lakh made to NCRP and 1930 will automatically lead to registration of a Zero FIR** with the e-Crime Police Station of Delhi.
- This will be immediately routed to the **territorial Cyber Crime Police Stations**.
- Complainants can visit the **cybercrime Police Station within 3 days** and get the Zero FIR converted into a regular FIR.

**Non-Personal Data**

The Unique Identification Authority of India (UIDAI) has **started sharing non-personal, anonymized data from the Aadhaar Dashboard** on the open government data platform.

➤ It can be used for **governance and investment purposes**.

**What is Non-Personal Data?**

- Any data which is **not personal data** (Data pertaining to characteristics, traits or attributes of identity) is categorised as non-personal data. It includes:
  - ⊕ **Public non-personal data:** Government-collected anonymised data, e.g., vehicle registration.
  - ⊕ **Community non-personal data:** Raw data from communities, e.g., municipal datasets.
  - ⊕ **Private non-personal data:** Data from private entities, e.g., logistics data of private firms.

**Global Environment Facility**

A recent study has revealed that **funds under the Global Environment Facility (GEF) are not reaching indigenous people** who protect nature.

**About GEF**

- GEF is a major international financial mechanism **established in 1992 during the Rio Earth Summit to help developing countries** address complex challenges and work towards meeting international environmental goals.
- It is a **financial mechanism for 5 major international environmental conventions**:
  - ⊕ United Nations Framework Convention on Climate Change (UNFCCC)
  - ⊕ United Nations Convention on Biological Diversity (UNCBD)
  - ⊕ United Nations Convention to Combat Desertification (UNCCD)
  - ⊕ Minamata Convention on Mercury
  - ⊕ Stockholm Convention on Persistent Organic Pollutants (POPs)

**Place in News**



**Argentina (Capital: Buenos Aires)**

The **Perito Moreno glacier**, called the '**White Giant**', located in the **Los Glaciares National Park** — a UNESCO World Heritage Site in **Argentina** is facing **ice loss** by calving.

**Political Features**

- **Located in southern South America.**
- **Boundaries:** **Chile (west); Bolivia, Paraguay, Brazil and Uruguay (north); Maritime- Atlantic Ocean (east).**
- **Argentina-Chile international border** is the **3<sup>rd</sup> longest globally** after USA-Canada and Kazakhstan-Russia.
- **Ushuaia** in Argentina is regarded as the **southernmost city in the world**.

**Geographical Features**

- **Climate:** Mostly temperate; arid in southeast; subantarctic in southwest.
- **Terrain:** **Comprises regions:** The Andes mountains(west), the Pampas, and Patagonia Plateau.  
⊕ **The Pampas (treeless plains) is the agricultural heartland.**
- **Highest point:** Cerro Aconcagua (highest point in South America)
- **Major rivers:** Río de la Plata/Paraná river mouth
- Argentina ranks **3<sup>rd</sup> in global lithium reserves** and **4<sup>th</sup> in lithium production**.

