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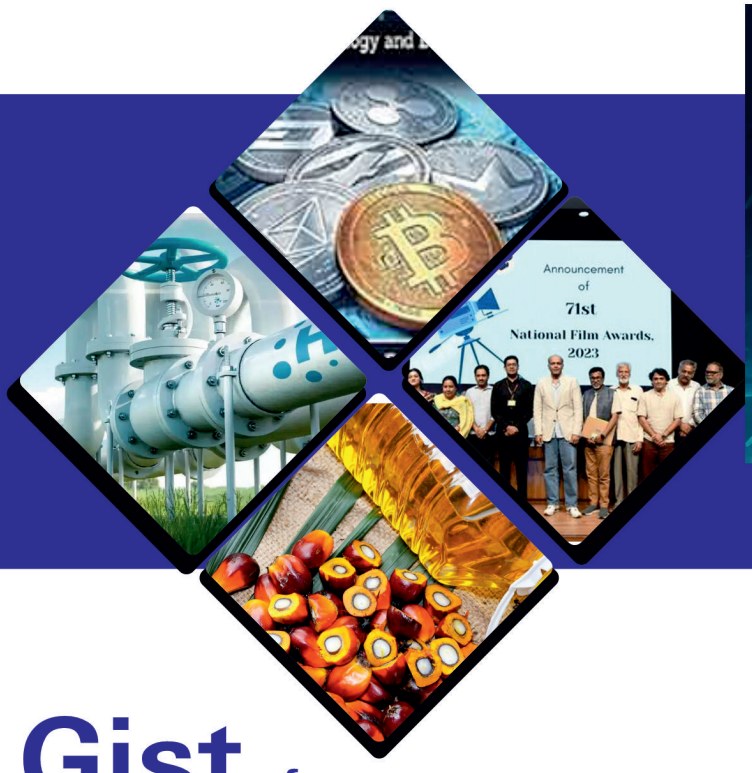

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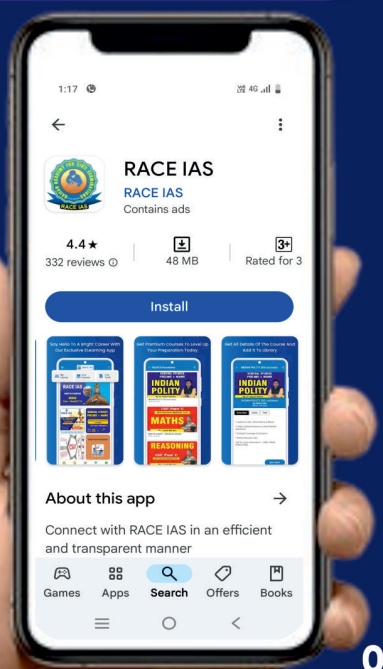

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CURRENT AFFAIRS

71st National Film Awards

Context

The **71st National Film Awards** were recently announced by the **Ministry of Information and Broadcasting**, highlighting excellence in Indian cinema for the year 2023. The awards sparked national attention due to notable films like 12th Fail, Sam Bahadur, and The Kerala Story winning major honors.

About the News

- **Announced by Directorate of Film Festivals** under **Ministry of Information and Broadcasting**.
- **President of India** presents these awards annually since **1954**.
- **Covers all Indian languages**, promoting regional representation in cinema.
- **Films with social, cultural, or national themes** often dominate selections.

Highlights of the 71st National Film Awards 2025

Top Acting Honors:

- **Best Actor**: Shah Rukh Khan for Jawan and Vikrant Massey for 12th Fail — jointly awarded.
- **Best Actress**: Rani Mukerji for her performance in Mrs Chatterjee Vs Norway.

Feature Film Recognitions:

- **Best Feature Film Overall**: 12th Fail
- **Best Hindi Film**: Kathal: A Jackfruit Mystery

Craft and Technical Excellence:

- **Best Director**: Sudipto Sen for The Kerala Story
- **Best Music Direction**:
  - G.V. Prakash Kumar (songs) for Vaathi
  - Harshavardhan Rameshwar (background score) for Animal

Special Mention: MR Radhakrishnan (Re-recording mixer) for his work in Animal

Disqualification of MP & MLA

Context

A serious criminal case involving **Prajwal Revanna**, grandson of ex-Prime Minister H.D. Deve Gowda, has sparked legal and political debate on **criminality in politics** and **legislator disqualification** in India.

About the News

- **Revanna convicted** for **rape and sexual assault**, as per Bengaluru court ruling.
- **Victims include domestic workers and their daughters** at his residence.
- **Strong digital and forensic evidence**, including DNA and video footage.

Provisions Related to disqualification

- **Representation of the People Act, 1951 (RPA Act): Immediate disqualification** if convicted for **2+ years imprisonment**. Applies to both MPs and MLAs without delay.
- **Six-year ban from contesting elections** after conviction. Further limits political participation.
- **Article 102** of the Constitution governs disqualification of **MPs**. Mentions legal grounds including conviction.
- **Article 191** of the Constitution applies to **MLAs and MLCs**. Follows the same principles for state legislators.
- **Lily Thomas Case (2013)** mandates **instant disqualification**. Rejected idea of waiting until appeal is heard.

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- **Lok Prahari Case** addressed the continued **presence of tainted lawmakers**.
  The court emphasized a clean legislature as democratic necessity.
- **52nd Constitutional Amendment (1985):** Related to anti-defection law.
- **91st Constitutional Amendment:** Changed the requirement for merger from 1/3 to 2/3 of members to avoid disqualification under anti-defection law.

Challenges

- **Delays in conviction allow criminals to contest**.
  Many accused win elections before trial concludes.
- **Political shielding blocks justice**.
  High-profile leaders often evade arrest or trial.
- **Legal loopholes protect convicted lawmakers**.
  Appeals often used to delay disqualification.
- **Public trust in democracy erodes**.
  Convicted lawmakers damage legitimacy of Parliament.

Way Forward

- **Fast-track courts** for cases involving lawmakers.
  Ensure timely justice and electoral accountability.
- **Election Commission must act proactively**.
  ECI can recommend suspension upon conviction.
- **Clear separation of executive and judicial powers**.
  Reduces interference in politically sensitive trials.
- **Awareness among voters about criminal candidates**.
  Public campaigns can pressure parties to deny tickets.

Conclusion

The case of Prajwal Revanna reopens a **crucial debate on criminalisation of politics**, demanding **urgent reforms** in disqualification laws to ensure that **only clean and ethical individuals represent the people**.

Financial Inclusion Index (FII)

Context

The **Reserve Bank of India (RBI)** released the latest **Financial Inclusion Index (FII)** in **July 2024**, highlighting progress and challenges in delivering banking and financial services to underserved populations across India.

About the News

- **FII is developed by the RBI** to measure inclusive financial progress.
- **Covers banking, insurance, credit, pension, and digital payments**.
- **Scores range from 0 (exclusion) to 100 (complete inclusion)**.
- **Base year** for computation is **2019–20**.

3 Parameters of Financial Inclusion Index (FII)

- **Access (35%)**: Bank branches, ATMs, digital and mobile infrastructure.
  Focus on physical and digital availability of services.
- **Usage (45%)**: Account activity, card usage, insurance, credit.
  Highlights actual adoption by citizens.
- **Quality (20%)**: Financial literacy, grievance redressal, trust.
  Evaluates service reliability and user empowerment.

Major Government Schemes for Financial Inclusion

India has launched several focused schemes to ensure wider access to financial services:

- **Jan Dhan Yojana**: Opened zero-balance bank accounts with RuPay cards, insurance, and overdraft; over **50 crore accounts** opened by 2024.
- **MUDRA Yojana**: Provides loans up to ₹10 lakh for small, non-corporate enterprises under **Shishu, Kishor, and Tarun** categories.
- **Atal Pension Yojana**: Ensures pension for unorganised workers through regular contributions linked to bank accounts.
- **Digital India & UPI**: Enabled widespread access to digital transactions, boosting financial inclusion at the grassroots.
- **Suraksha Bima Yojana**: Accident insurance of ₹2 lakh for a yearly premium of just ₹12.

- **Jeevan Jyoti Bima Yojana**: Life insurance of ₹2 lakh for ₹330 per year, aimed at low-income individuals.

Challenges

- **Dormant accounts, especially under PMJDY**, remain unused.
  Reflects lack of financial engagement despite account ownership.
- **Gender imbalance in banking access** persists.
  Fewer women hold or use bank accounts actively.
- **Poor connectivity in tribal and remote areas**.
  Leads to lack of ATMs, branches, and BC coverage.
- **Cybersecurity and fraud risks in digital payments**.
  Threatens trust in mobile banking and UPI platforms.

Way Forward

- **Strengthen financial literacy** through targeted rural programs.
  Helps users understand savings, credit, and insurance products.
- **Expand ATM and BC network in remote districts**.
  Improves access where banking infrastructure is absent.
- **Empower women via targeted credit schemes**.
  Close gender gap through SHGs and microloans.
- **Enhance cybersecurity in digital banking systems**.
  Build user trust and protect digital finance platforms.

Conclusion

The Financial Inclusion Index serves as a **comprehensive tool to assess India's financial progress**, but to ensure **equity and empowerment**, efforts must go beyond infrastructure, focusing on **usage, quality, and digital security**, especially for **vulnerable and rural populations**.

India's Pesticide Market

Context:

India's crop protection sector is shifting, with herbicides booming due to labour shortages, mechanised farming, and preventive practices in labour-intensive crops like rice and wheat.

About Crop Protection Market

Definition:

Crop protection chemicals, broadly referred to as **pesticides**, are substances used to shield crops from various biotic stresses. They fall under three primary categories:

- **Insecticides** – combat insect pests,
- **Fungicides** – prevent or control fungal infections,
- **Herbicides** – suppress or eliminate unwanted weeds.

Herbicide Boom:

1. Labour Shortages in Rural India

India's rural agricultural workforce is diminishing both in size and availability. Manual weeding, once the norm, is now both expensive and inefficient:

- **Wage Inflation:** Agricultural wages increased from ₹326 per day in 2019 to ₹447 in 2024, indicating significant wage inflation impacting farm labour costs across India.
- **Seasonal Scarcity:** Peak weeding times coincide with other harvests, creating labour bottlenecks.
  Herbicides offer a time-saving alternative, with application taking **just 1–2 hours per acre** compared to **8–10 hours manually**.

2. Timeliness and Preventive Use

Herbicides are no longer used merely as curative agents but are increasingly employed as **preventive tools**:

- **Pre-emergent** sprays are applied before or at sowing, especially in **paddy (₹550 crore)** and **wheat (₹200 crore)** segments.
- These prevent weed growth altogether, improving fertiliser efficiency and reducing crop competition for nutrients.

3. Rise of Mechanisation and Smart Practices

Use of **mechanical sprayers**, drones, and AI-supported farming tools is enabling **precision application**, reducing wastage and improving yield consistency.

Impacts on the Agriculture Ecosystem

Aspect	Impact
Rural Labour Market	Reduces demand for seasonal weeders; may

	push migration to non-farm jobs
Cost of Cultivation	Herbicides reduce operational cost per acre despite initial product expense
Productivity/Yield	Better weed management leads to optimal use of inputs like fertilisers and irrigation
Food Security	Supports stable production amidst rural-urban migration and demographic changes
Ecological Risks	Excessive herbicide usage risks resistance development and threatens biodiversity

Regulatory and Policy Challenges

1. **Ecological Risks and Chemical Resistance:**
   Over-dependence on herbicides can foster **resistant weed species** and lead to ecological imbalance.
2. **Access and Affordability for Smallholders:**
   Marginal farmers may find quality herbicides unaffordable without **bulk-buying systems** or **subsidy support**.
3. **Domestic R&D Lag:**
   Unlike China's **Sinochem** or Western giants, India lacks a strong, state-supported agrochemical behemoth. Investment in **public-private innovation** is limited.
4. **Regulation and Awareness:**
   There is a pressing need to improve **regulatory oversight**, mandate **safe usage guidelines**, and enhance farmer **training** via institutions like KVKs and FPOs.

Way Forward

1. Boost Indigenous R&D and IPR

- Set up **National Herbicide Innovation Centres**.
- Encourage patent filings for **indigenous formulations**.
- Offer fiscal incentives to Indian start-ups in agri-chemicals.

2. Integrated Weed Management (IWM)

- Promote a hybrid model that integrates **manual, mechanical, and chemical** weed control.
- Reduce ecological dependence on a single method of weed suppression.

3. Public Sector Participation

- Encourage **public sector undertakings (PSUs)** to manufacture generic herbicides.
- This can create **pricing parity** and reduce MNC hegemony.

4. Training and Responsible Use

- Mandate herbicide training for marginal farmers using **digital apps, FPOs, and Krishi Vigyan Kendras**.
- Emphasise correct **dosage, timing, and disposal practices**.

5. Subsidised Pricing Models

- Implement **Direct Benefit Transfer (DBT)** for low-income farmers.
- Encourage **farmer cooperatives** for pooled procurement to enhance affordability.

Conclusion

The sharp rise in herbicide usage reflects not just a product trend but a deeper transformation in India's agricultural economy. It symbolizes the shift from labour-intensive to **input-optimised farming**, spurred by demographic shifts, rising wage pressures, and mechanisation.

AI-Powered Health Tracking in Anganwadis

Context:

In a pioneering move, Nagpur district in Maharashtra has launched India's first **AI-integrated anganwadi**, signalling a paradigm shift in rural early childhood care. By merging artificial intelligence with gamified learning, health monitoring, and personalised education, this initiative reflects the evolving face of the **Integrated Child Development Services (ICDS)** in the digital age.

Evolution of Anganwadis

- **Traditional Role:**
  Anganwadis, under the ICDS (Integrated Child Development Services) umbrella, have long served as grassroots institutions delivering **nutrition, healthcare, and pre-primary education** to children under six, as well as maternal care to expecting and lactating women.
- **Transformative Leap:**
  The newly inaugurated **AI-powered anganwadi** by **Nagpur Zilla Parishad** marks a leap from manual service delivery to a digitally responsive ecosystem, capable of addressing not just physical needs but also **cognitive, linguistic, and emotional development** in real-time.

Key Innovations Introduced

1. AI-Personalised Learning Systems

- **Adaptive Curriculum Engines**: Tools like **Gemini** and **Perplexity AI** dynamically adjust content difficulty based on a child's learning pace.
- **Interactive Learning Aids**: Smart boards, **VR headsets**, and gamified modules ensure **multi-sensory engagement**.
- **FITA (Fun in the Anganwadi)**: Introduces a joyful learning environment using AI-monitored songs, games, and comprehension exercises.
- **Real-Time Learning Progress**: AI tools maintain a personalised growth chart for each child.

2. Upskilling Anganwadi Workers

- **AI Literacy Programs**: Structured training sessions three times a week help build digital fluency among workers.
- **Role as Facilitators**: With AI handling adaptive instruction, anganwadi workers evolve into mentors guiding children in **self-paced learning** environments.
- **Digital Collaboration**: Regular coordination between trainers and field workers bridges the urban-rural digital skill gap.

3. Integrated Health and Nutrition Monitoring

- **Real-Time Development Tracking**: AI systems track physical growth and cognitive benchmarks using structured observation and digital inputs.
- **Linkage with Poshan Tracker**: Nutritional data is updated live, with **meal images uploaded** for AI-based feedback on dietary appropriateness.
- **Maternal Health Monitoring**: Pregnancy tracking and maternal health updates are streamlined through automated dashboards.

Broader Social and Educational Impact

Dimension	Impact
Digital Inclusion	Bridges rural-urban educational divi tools in remote areas.
Language Diversification	Encourages multilingual learning—E even foreign languages.
Attendance & Engagement	Gamified lessons and visual tools re promote joyful learning.
Maternal and Child Health	AI-backed dashboards improve tracl milestones.

Challenges

1. **Technological Resistance:**
   Some anganwadi workers lack exposure to digital platforms, leading to initial reluctance in adopting AI tools.
2. **Skill Development Gaps:**
   Continuous training is needed to ensure long-term adoption and confidence in using AI-based systems.
3. **Infrastructure Bottlenecks:**
   Unreliable **power supply** and patchy **internet connectivity** hamper seamless digital functioning, particularly in remote areas.

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4. **Adaptation Curve in Rural Contexts:** Shifting from traditional oral instruction to digital learning requires behavioural change among both **educators and parents**.

Wayforward

1. Capacity Building and Training

- Introduce **continuous AI skill-building** programs for anganwadi workers through **state-run institutes and NGOs**.
- Encourage **peer learning models**, where early adopters train others within their clusters.

2. Infrastructure Investment

- Ensure uninterrupted internet access with **offline-mode functionality** during power cuts.
- Provide **solar-powered kits** and backup systems for uninterrupted digital operation.

3. Scalable and Customisable Models

- Use the Nagpur model as a **pilot blueprint**, with **context-specific customisation** for tribal, hilly, or remote regions.

4. Community Sensitisation and Parental Inclusion

- Conduct **awareness drives** to familiarise parents with AI-led education and nutritional tracking.
- Involve local community leaders to ensure **social acceptance and trust-building**.

5. Data Privacy and Child Protection

- Design a robust framework for **data protection**, including encryption and restricted access to sensitive health and educational records.
- Comply with **Personal Data Protection Act** and **UNCRC child rights guidelines**.

Conclusion

India's first AI-powered anganwadi merges technology, gamification, and care to transform rural childhood learning. Success hinges on scaling with infrastructure, policy backing, skill development, and deep community involvement.

Palm Oil

Context:

With soaring demand and tightening global supply, palm oil presents a critical challenge for India, the world's largest importer — to balance rising costs with enhanced domestic production. Accounting for nearly 50% of global vegetable oil consumption, palm oil holds immense economic and strategic importance, making India's policy response vital for ensuring edible oil security and long-term resilience.

Palm Oil: Nature, Uses, and Global Dependence

What is Palm Oil?

Palm oil is a widely used **edible vegetable oil**, extracted from the **fruit of the oil palm tree (Elaeis guineensis)**. It is known for its versatility and low production cost.

Applications:

- **Edible Use**: Cooking oil, packaged foods, baked goods.
- **Industrial Use**: Soaps, cosmetics, detergents, pharmaceuticals.
- **Energy Sector**: Biofuel blending in several countries.

Global Production Landscape and Emerging Crisis

1. Dominant Exporters:

- **Indonesia** (No. 1) and **Malaysia** (No. 2) account for nearly **85% of the world's palm oil exports**.

2. Declining Output Forecast:

- Global supply is projected to decline by **up to 20% by 2030**.

3. Reasons Behind the Downturn:

Factor	Impact
Aging Trees	Old palms yield less fruit, lowering productivity.
Aging Farmers	Youth disinterest in palm farming hampers replantation.
Weak Policy Support	Limited subsidies discourage new cultivation.

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Biofuel Diversion	Indonesia and Malaysia increasingly use palm oil for **domestic biodiesel blending**, reducing exportable volumes.

India's High-Stakes Role in the Global Palm Oil Trade

1. Major Importer:

- India is the **world's largest importer** of palm oil.
- Imports cover over **60% of India's edible oil needs**.

2. Low Domestic Output:

- Local production is minimal and concentrated in:
  - **Andhra Pradesh**
  - **Telangana**
  - **Kerala**

  These three states contribute **98% of domestic palm oil output**.

3. Vulnerability to Global Prices:

- A reduction in global supply can lead to **price spikes**, triggering **food inflation** in India — especially in the **lower-income segments** who rely on affordable cooking oils.

Government Strategy:

National Mission on Edible Oils – Oil Palm (NMEO-OP)

Launched:

2021, as a **Centrally Sponsored Scheme**.

Objectives:

- **Reduce import dependency** by enhancing domestic production of **Crude Palm Oil (CPO)**.
- **Expand cultivation area**, especially in climate-suitable zones.

Focus Regions:

- **North Eastern States**
- **Andaman & Nicobar Islands**

  These have been identified due to suitable agro-climatic conditions and strategic proximity to Southeast Asia.

Types of Palm Oil: Know the Difference

Type	Source	Uses
Crude Palm Oil (CPO)	Extracted from palm fruit	Cooking, processed food industry
Palm Kernel Oil (PKO)	Extracted from the seed/kernel	Cos goo

Geographic Origin:

Contrary to popular belief, **oil palm trees are native to West and Central Africa**. However, Indonesia and Malaysia later emerged as the dominant producers due to **large-scale plantation economies and favourable weather**.

Challenges

1. **Land and Water Requirements:** Oil palm requires high rainfall and irrigation, raising environmental concerns.
2. **Long Gestation Period:** Takes 4–6 years to mature, delaying economic returns for farmers.
3. **Ecological Concerns:** Risk of **deforestation**, **loss of biodiversity**, and **soil degradation** if not managed sustainably.
4. **Global Volatility:** India's dependence on volatile international markets remains a major vulnerability.

Way Forward

1. Agro-Climatic Zoning

- Identify micro-climatic zones suitable for sustainable oil palm cultivation.

2. Incentivise Domestic Cultivation

- Provide **input subsidies**, **price assurance**, and **long-term procurement agreements** for farmers.

3. Research and Development

- Develop **drought-resistant and early-yielding palm varieties** through ICAR and agricultural universities.

4. Diversify Import Sources

- Explore **alternative import partners** to reduce over-dependence on Southeast Asia.

5. Balanced Biofuel Policy

- Ensure biofuel policies in producing nations don't choke edible oil availability in global markets.

Conclusion

The looming decline in global palm oil exports, driven by structural supply constraints and rising biofuel use, poses a significant challenge to **India's edible oil security**. While the government has rightly initiated **NMEO-OP** to

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address this, success depends on **balancing environmental sustainability**, **farmer incentives**, and **long-term trade strategy**. Strengthening domestic capacity while cushioning against global shocks is the only viable path to food price stability.

Cryptocurrency & Money Laundering

The Enforcement Directorate conducted searches at 11 locations in Delhi-NCR and Dehradun, investigating a ₹260 crore international cyber fraud where scammers posed as law enforcement and laundered money via cryptocurrency and hawala channels.

Crypto-Based Money Laundering

Definition:

Money laundering through digital currencies involves disguising the origins of illegally obtained funds by converting them into cryptocurrencies like Bitcoin, Monero, or Tether (USDT). These funds are then routed through various layers and eventually converted back into fiat currency or assets, making them appear legitimate.

Key Enablers of Crypto-Fueled Laundering

- **User Anonymity:** Crypto wallets can be created without disclosing personal identity.
- **Rapid Global Transactions:** Cross-border transfers are instant and low-cost.
- **Minimal Transaction Fees:** Automating transfers via scripts allows large-scale laundering at low expense.
- **Jurisdictional Loopholes:** Crypto operates beyond national borders, sidestepping capital controls.
- **Lack of Central Control:** Decentralized platforms and privacy-enhancing coins reduce traceability.

Placement

Purpose: Introduce illicit funds into the financial system.

Crypto Use: Buy crypto via poorly regulated exchanges using illicit cash.

Example:

In 2021, **North Korean hackers** laundered ransomware proceeds by purchasing Bitcoin through overseas exchanges in Southeast Asia with lax KYC rules.

2. Layering

Purpose: Obscure the origin of funds by creating complex transaction trails.

Crypto Use: Split holdings across wallets, use mixers (e.g., Tornado Cash), privacy coins (e.g., Monero), NFTs, or gambling sites.

Example:

Lazarus Group used **Tornado Cash** to launder over $450 million in crypto from the **Axie Infinity hack**, fragmenting and mixing the funds to evade tracing.

3. Integration

Purpose: Reintroduce laundered funds into the legal economy.

Crypto Use: Convert crypto to fiat via ATMs or shell firms, purchase luxury assets, real estate, or run fraudulent ICOs.

Example:

In 2022, a **Russian oligarch** reportedly used crypto profits to **buy luxury apartments in Dubai**, using shell companies and crypto-fiat conversion services.

Associated Challenges

- **Inadequate KYC/AML Standards:** Many platforms lack stringent compliance procedures.
- **Untraceable Tools:** Mixers and privacy coins mask sender/receiver and transaction histories.
- **Regulatory Fragmentation:** Inconsistent international crypto laws hamper cooperation.
- **Weak Prosecution Record:** India saw only 15 convictions out of 5,892 money laundering cases under PMLA up to 2025.
- **Shadow Platforms:** Crypto ATMs and P2P transactions are difficult to monitor.

Way Forward

- **Update Legal Framework:** Amend PMLA to address crypto-related money laundering explicitly.
- **Enhance Global Coordination:** Utilize international frameworks like FATF and DTAAs to enable cross-border data exchange.
- **Leverage Tech:** Use AI-driven blockchain analytics for real-time monitoring and anomaly detection.

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- **Strengthen Compliance:** Enforce universal KYC/AML protocols for all exchanges and wallets.
- **Monitor Obfuscation Tools:** Regulate mixers and privacy coins with mandatory audit requirements.

Conclusion

The ₹260 crore crypto fraud case underlines a pressing challenge, the exploitation of digital currencies for organized financial crimes. As cryptocurrencies evolve, so does their misuse. India must move swiftly with smart regulations and cross-border collaboration to safeguard its financial ecosystem. Cryptocurrencies can be transformative, but without oversight, they risk becoming enablers of serious crime.

Necropolitics

Contextual Focus:

A recent incident in Gaza, where a civilian was killed while seeking humanitarian aid, has brought global focus back to the concept of necropolitics — a theory that scrutinizes how political power governs life and death.

What is Necropolitics?

Definition:

Necropolitics, a term introduced by political theorist **Achille Mbembe**, explores the extent to which sovereign power can decide who is allowed to live and who is consigned to death, either directly or through neglect. It builds upon **Michel Foucault's concept of biopolitics**, shifting attention from the regulation of life to the management of death.

Core Idea:

Unlike biopolitics, which is concerned with improving and managing life through institutions, necropolitics deals with systems that normalize death, abandonment, and suffering — often targeting the most vulnerable.

Key Consequences of Necropolitical Governance

- **Undermines Legal Protections:** Legal rights and constitutional guarantees are selectively implemented, turning justice into a matter of bureaucratic convenience rather than moral duty.
- **Institutionalises Inequality:** Daily experiences of caste-based discrimination, racial injustice, poverty, and forced displacement become forms of slow, structural violence.
- **Devalues Human Lives:** Victims of such systems are often reduced to statistics, with public apathy and state silence deepening their invisibility.

Conclusion

Necropolitics is not merely about death — it is about **whose lives are deemed expendable** in political and administrative decision-making. In the Indian context, it offers a sharp analytical tool to examine systemic injustices and the **failure of state institutions to uphold constitutional morality**. Addressing such power dynamics is crucial to ensuring a just, inclusive, and humane governance framework.

Strategic Interventions for Green Hydrogen Transition (SIGHT) Scheme

Context:

India achieved a milestone price of ₹55.75/kg for Green Ammonia in SECI's first auction under the SIGHT scheme—advancing the National Green Hydrogen Mission.

What is the SIGHT Scheme?

A major financial support mechanism under India's **National Green Hydrogen Mission**, designed to promote the production and use of **green hydrogen** and its derivatives.

Implemented by:

- Ministry of New & Renewable Energy (MNRE)
- Ministry of Petroleum & Natural Gas (MoPNG)

Objectives:

- Scale up green hydrogen production
- Make it cost-competitive with fossil fuels
- Build domestic demand in key sectors

Implementation Modes:

- **Mode 1:** Incentives go to lowest bidders (reverse auction)

- **Mode 2A:** Incentives for aggregated Green Ammonia demand
- **Mode 2B:** Incentives for aggregated Green Hydrogen demand

Key Features:

- **Budget Allocation:** ₹17,490 crore under SIGHT (part of ₹19,744 crore mission)
- **Incentive Rates (Mode 2B):**
  - ₹50/kg (Year 1)
  - ₹40/kg (Year 2)
  - ₹30/kg (Year 3)
- **Bidding:** Conducted by SECI and oil PSUs through reverse auctions
- **Eligibility:** Hydrogen must meet official "green" standards
- **Monitoring:** Oversight by a joint MNRE–MoPNG committee

First Green Ammonia Auction

What is Green Ammonia?

A compound made from **green hydrogen** using renewable energy. It's crucial for fertilisers, maritime fuel, and industrial applications.

Auction Details:

- **Winning Bid:** ₹55.75/kg (approx. USD 641/MT)
- **Buyer:** Paradeep Phosphates Ltd., Odisha
- **Awarded Quantity:** 75,000 MTPA (from 7.24 lakh MTPA total)
- **Contract Duration:** 10 years

Significance:

- Supports India's shift to low-carbon fertilisers
- Reduces dependence on imports
- Encourages long-term investments in green hydrogen
- Positions India as a global green ammonia supplier

Conclusion

The SIGHT scheme marks a pivotal step in India's green energy journey, fostering innovation, reducing emissions, attracting investments, and setting the foundation for a self-reliant, export-oriented green hydrogen economy.

Rabies

Context

Rabies, a fatal yet preventable zoonotic disease, causes thousands of deaths annually, with developing nations most affected; WHO classifies it as a Neglected Tropical Disease.

Nature and Cause

- **Type of Disease:** Acute and almost always fatal viral infection affecting mammals, including humans.
- **Causative Agent:** Rabies virus, an RNA virus classified under the *Rhabdoviridae* family.
- **Mode of Transmission:** Primarily spread through saliva from the bite or scratch of an infected animal, most often dogs.

Disease Progression

1. **Entry Point:** Virus enters via broken skin or mucous membranes.
2. **Local Multiplication:** Initial replication occurs in muscle cells near the bite site.
3. **Neural Spread:** Virus travels along peripheral nerves toward the brain.
4. **CNS (Central Nervous System) Impact:** Causes inflammation of the brain (encephalitis) and disrupts nervous system functions.

Epidemiological Highlights

- **Mortality:** 100% fatal after symptom onset.
- **Animal Reservoirs:**
  - Dogs account for ~99% of human rabies cases.
  - Also found in cats, monkeys, and certain wild species.
- **Geographic Spread:** Present globally except Antarctica.
- **Incubation Period:** Typically 1–3 months; can vary from a week to over a year.

Clinical Symptoms

Early Signs: Fever, discomfort, tingling, or burning at the bite site.

Advanced Stages:

- **Furious Rabies:** Hyperactivity, aggression, hydrophobia (fear of water).
- **Paralytic Rabies:** Progressive muscle weakness, paralysis, coma, and death.

Rabies Situation in India

- Rabies continues to be a major public health concern in India, which accounts for around **36% of global rabies deaths**.
- The disease causes an estimated **18,000–20,000 deaths** annually in the country.
- **Children under 15 years** contribute to about **30–60%** of reported rabies cases

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and fatalities, largely because bites in this age group are often unnoticed or unreported.

- **Dogs** are the primary source of transmission, responsible for approximately **97%** of human rabies cases.
- Other sources include **cats (around 2%)** and wild animals such as **jackals and mongooses (about 1%)**.
- Rabies is **endemic across all regions** of India.

Prevention and Control Measures

1. Animal Vaccination

- Regular canine vaccination programs to block transmission at the source.

2. Human Vaccination

- **Pre-exposure Prophylaxis:** For high-risk groups (e.g., veterinarians, lab staff).
- **Post-exposure Prophylaxis (PEP):** Immediate wound cleaning with soap and water followed by a full vaccine course (4–5 doses).

3. Awareness Campaigns

- Education on bite prevention and the urgency of prompt medical care.

Challenges

- **Low Awareness:** Many rural communities lack knowledge about PEP.
- **Vaccine Accessibility:** Limited availability in remote areas delays treatment.
- **Animal Control Gaps:** Stray dog population management remains insufficient.
- **Cultural Barriers:** Reliance on traditional healing methods instead of medical care.

Way Forward

1. **Mass Dog Vaccination Drives:** Prioritise high-incidence zones to break the transmission cycle.
2. **Universal PEP Access:** Ensure vaccine stock in all primary health centres.
3. **Community Education:** Engage schools, local leaders, and NGOs in awareness outreach.
4. **Integrated One Health Approach:** Coordinate veterinary, medical, and public health sectors for joint action.
5. **Global Collaboration:** Support WHO's goal of zero human rabies deaths by 2030 through joint funding and data-sharing.

Conclusion

Rabies is an entirely preventable yet universally fatal disease once symptoms begin. Eliminating human rabies deaths hinges on proactive dog vaccination, timely human prophylaxis, widespread awareness, and a coordinated *One Health* strategy. With sustained policy action and community participation, rabies can be relegated to history.

India Electric Mobility Index (IEMI) 2024

Context

NITI Aayog introduced the India Electric Mobility Index 2024, a first-of-its-kind tool to assess and guide States/UTs in electric mobility transition, aligning regional initiatives with India's net-zero emissions target for 2070.

About India Electric Mobility Index

Definition:

A national benchmarking framework that scores all States/UTs on a 0–100 scale, based on progress in EV adoption, charging infrastructure, and innovation.

Objective:

To track and accelerate EV transition, promote healthy competition among states, and support policy alignment with national climate goals.

Core Themes & Evaluation Criteria

1. **Transport Electrification Progress**
   - Measures EV adoption in passenger, freight, and public transport sectors.
2. **Charging Infrastructure Readiness**
   - Assesses the availability and growth of public/private charging stations, alongside state policy support.
3. **EV Research & Innovation Ecosystem**
   - Evaluates R&D strength, manufacturing capacity, and technological advancements in EV components.

Key Features of IEMI

- **Comparative Scoring:** Standardised 0–100 score for all states/UTs.
- **Interactive Dashboard:** Real-time comparison, rankings, and insights.
- **Healthy Competition:** Encourages peer learning and innovation among states.

- **Policy Guidance Tool:** Identifies best practices and gaps for targeted interventions.
- **Cross-Sectoral Use:** Assists in investment planning, inter-ministerial coordination, and capacity building.

India Electric Mobility Index 2024
Key Trends & Rankings

1. Delhi
2. Maharashtra
3. Chandigarh

National Trends:

- **EV Share in Sales:** Increased from 5% in 2018 to 7.7% in 2024.
- **Total EVs on Road:** Crossed 5 million by June 2025; 12 lakh registered in 2024 alone.
- **Charging Infrastructure:** Over 25,000 public charging stations installed by October 2024; Karnataka leads in installations.
- **Policy Coverage:** 29 states/UTs have operational EV policies; 4 more in draft stage.

Significance of IEMI

Dimension	Impact
Green Mobility Promotion	Aligns with net-zero by 2070 goals
Infrastructure Planning	Guides strategic charging station rollout
Innovation Support	Encourages EV manufacturing and R&D
Federal Competition	Spurs states to improve EV policies and adoption rates

Way Forward

1. **Expand Charging Infrastructure:** Address gaps in rural and semi-urban areas.
2. **Strengthen R&D Ecosystem:** Encourage localisation of EV technology and components.
3. **Policy Harmonisation:** Ensure EV incentives and rules are consistent across states.
4. **Public Awareness Campaigns:** Promote consumer confidence in EV adoption.
5. **Integration with Renewable Energy:** Align EV charging networks with clean energy sources for maximum sustainability.

Conclusion

The India Electric Mobility Index offers a transparent, data-driven pathway for states and UTs to scale their EV transition. By fostering competition, guiding investment, and spotlighting best practices, IEMI can become a cornerstone in India's journey towards sustainable transportation and net-zero emissions.

Ethanol Blending in India

Context

On World Biofuel Day 2025 (10 August), India achieved 20% ethanol blending with petrol ahead of schedule, boosting energy security and climate goals, but raising concerns over engine wear, fuel efficiency, and consumer readiness.

About Ethanol

- **Definition:** A renewable biofuel produced from biomass such as sugarcane, maize, rice, and other agricultural residues.
- **Role in Fuel:** Acts as an oxygenate when mixed with petrol, improving combustion efficiency and reducing harmful emissions.
- **Blending Ratios:** Common blends include E10 (10% ethanol) and E20 (20% ethanol). Higher blends like E85 are used in flex-fuel vehicles in some countries.

Flex-fuel vehicles

1. Vehicles run on petrol or ethanol blends interchangeably.
2. The engine adjusts automatically to varying ethanol-petrol ratios.
3. Helps reduce crude oil dependence and carbon emissions.
4. Supports use of locally produced biofuels.
5. Common in Brazil, USA, Canada, and Sweden.

Ethanol Blending Programme (EBP) – Policy Journey

- **Launch:** 2003, with an initial target of 5% blending.
- **E10 Target:** Achieved in 2022.

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- **E20 Target:** Achieved in March 2025, ahead of schedule; blending rose from **1.53% in 2014 to 20% in 2025**.
- **Future Target:** E30 by 2030, using both food grains and second-generation (2G) bioethanol.
- **Implementing Body:** Ministry of Petroleum and Natural Gas (MoPNG), with procurement handled by Oil Marketing Companies (OMCs).

Government Measures & Initiatives

1. Policy Framework

- **National Policy on Biofuels (2018, amended 2022):** Expanded feedstock base beyond molasses to include sugarcane juice, maize, surplus rice from FCI, and damaged food grains.

2. Financial Incentives

- Fixed ethanol pricing by OMCs for producer stability.
- Interest subvention and capital support for setting up distilleries.
- Reduced GST on ethanol for EBP from 18% to 5%.

3. Infrastructure & Technology

- **PM-JI-VAN Yojana:** Promotes 2G ethanol from agri-waste like rice straw, helping reduce stubble burning.
- Norms released for E20 vehicles; some OEMs now producing E20-compliant models.
- Over **17,000 retail outlets** now dispense E20 fuel; E100 pumps being deployed.

4. Global Cooperation

- **Global Biofuels Alliance (GBA):** Led by India to harmonise global standards and foster collaboration in biofuels.

Benefits of Ethanol Blending

Benefit Area	Key Gains
Energy Security	Cuts crude oil imports, saving ₹1–1.5 lakh crore annually.
Environment	Reduces CO, hydrocarbons, particulate matter; lowers greenhouse gas emissions.
Agriculture	Generates new markets for sugarcane and surplus grains, boosting rural incomes.
Economy	Stabilises domestic fuel supply and reduces import expenditure.

Technical & Environmental Challenges

1. Engine & Vehicle Concerns

- Ethanol is **hygroscopic** (absorbs moisture), leading to corrosion of metal parts and breakdown of plastic/rubber components.
- Deposits loosened by ethanol can clog fuel systems.
- **Mileage Impact:** E20 can cause a **6–7% drop in mileage** for cars and **3–4% drop for two-wheelers** (NITI Aayog–MoPNG report).
- Cold-start problems and rough idling in higher blends, especially in older engines.

2. Limited Compatibility

- Most Indian two-wheelers are tuned for E10; lack of flex-fuel vehicles or retrofit guidelines for E20+ in mass-market segments.

3. Infrastructure Gaps

- Storage tanks, pipelines, and pumps in many fuel stations are not fully ethanol-compatible.

4. Feedstock & Sustainability Risks

- Heavy reliance on sugarcane impacts water resources and may affect food security if 2G ethanol production is not scaled up.

Industry & Consumer Readiness

- **Automakers:** Industry body SIAM calls for faster tech upgrades and clearer regulations.
- **Fuel Retailers:** Need nationwide ethanol-compatible infrastructure.
- **Consumers:** Lack of awareness on efficiency loss and potential maintenance needs.

Way Forward

1. **Vehicle Compatibility:**
    - Establish clear certification norms and incentivise rollout of flex-fuel vehicles.
2. **Consumer Protection:**
    - Consider GST rebates or mileage-linked incentives to offset increased per-km fuel costs from lower efficiency.

3. **Infrastructure Modernisation:**
    - Upgrade pipelines, storage, and pumps to ethanol-resistant standards.
4. **Feedstock Diversification:**
    - Prioritise 2G ethanol from agricultural residues to avoid food-versus-fuel conflicts.
5. **Public Awareness:**
    - Educate consumers on E20 performance, maintenance, and environmental benefits.

Conclusion

India's ethanol blending achievement is a major stride towards clean energy and reduced oil dependence. However, for it to remain a sustainable and widely accepted solution, **technical readiness, consumer confidence, and infrastructure upgrades** must move in parallel. Ethanol should be a green fuel that delivers on both climate commitments and public trust.

Bioactive Peptides

Context:

Research by the Institute of Advanced Study in Science and Technology (IASST), Guwahati, indicates that bioactive peptides present in fermented foods may provide health benefits specific to different population groups. This opens avenues for personalised nutrition approaches in India.

Bioactive Peptides:

- Small fragments of proteins, usually composed of 2–20 amino acids.
- Released during the fermentation of foods like yogurt, idli, miso, kimchi, natto, and fermented fish.
- Exhibit antimicrobial properties, helping fight harmful microbes.
- Have antioxidant effects, reducing oxidative stress in the body.
- Can lower blood pressure, contributing to cardiovascular health.
- Show immune-modulatory activity, supporting and regulating the immune system.

Key Characteristics:

- **Mechanism of Action:** Peptides interact with biological molecules through electrostatic interactions, hydrogen bonding, and hydrophobic effects.
- **Health Implications:** They influence cardiovascular health, metabolism, and immune system function.
- **Population-Specific Effects:** Their effectiveness may vary due to genetic differences (e.g., ACE or IL-6 gene variants), gut microbiome composition, and dietary patterns.
- **Research Approaches:** Advanced omics techniques are recommended for a detailed understanding of their effects.

Significance:

- **Public Health Relevance:** Can be incorporated into dietary recommendations to prevent or manage hypertension, diabetes, and immune-related disorders.
- **Cultural Importance:** Supports the global recognition of India's traditional fermented foods in modern nutritional science.

Conclusion:

Bioactive peptides from fermented foods hold significant potential for improving population-specific health outcomes in India. Integrating them into dietary guidelines and personalised nutrition plans can strengthen preventive healthcare, promote traditional diets, and support overall well-being.

S&P Global Raises India's Sovereign Credit Rating to 'BBB'

Context:

S&P Global has increased India's long-term unsolicited sovereign credit rating from 'BBB-' to 'BBB' after 18 years. The upgrade reflects India's strong economic resilience, fiscal prudence, and a stable policy framework.

S&P Global:

- Leading international credit rating agency headquartered in New York City, USA.
- Provides independent evaluations of borrowers' ability and willingness to meet financial obligations.
- Issues public ratings for securities and loans.
- Delivers confidential ratings for internal

assessments.
- Publishes analytical reports on credit risk across sectors: government, corporate, infrastructure, insurance, and public finance.
- Enhances transparency, helping investors assess creditworthiness and make informed financial decisions.

Details of India's Rating Upgrade:

- **Long-term Sovereign Rating:** Raised from BBB- to BBB.
- **Short-term Rating:** Upgraded from A-3 to A-2.
- **Foreign Exchange Transfer & Convertibility Assessment:** Elevated from BBB+ to A-.
- This is the first sovereign rating upgrade for India by S&P since January 2007.

Factors Behind the Upgrade:

- Strong GDP growth and resilient macroeconomic fundamentals.
- Continued fiscal consolidation with better quality of public spending.
- Stable monetary policy that anchors inflation expectations.

Significance of the Upgrade:

- Places India firmly within the investment-grade category, boosting global investor confidence.
- Likely to increase foreign portfolio investments, especially in bond markets.
- May lower borrowing costs for both the government and corporations.
- Strengthens India's position as a prominent emerging market with improved market sentiment.
- Opens opportunities for further upgrades if fiscal deficit and debt-to-GDP ratios continue to improve.

Conclusion:

The upgrade reflects India's growing economic strength, prudent fiscal management, and policy stability, reinforcing its attractiveness for global investors and supporting future growth in financial markets.

Mission Sudarshan Chakra

Context:

On India's 79th Independence Day, the Prime Minister unveiled **Mission Sudarshan Chakra**, an indigenous, multi-layered defence initiative aimed at safeguarding the nation's strategic, civilian, and religious sites from potential threats.

About Mission Sudarshan Chakra:

- National security program aimed at protecting critical installations across India.
- Inspired by the mythological Sudarshan Chakra of Lord Krishna, combining cultural symbolism with defence technology.
- Led by the Ministry of Defence.
- Focuses on creating an advanced protective shield around key infrastructure.

Objectives:

- Develop a research-based, indigenous security system capable of countering threats from air, land, sea, and cyber domains.
- Promote self-reliance in critical defence technologies under the **Aatmanirbhar Bharat** framework.
- Provide proactive and integrated protection for key infrastructure, urban centres, and sacred sites.

Key Features:

- **Multi-Layered Defence:** Combines surveillance, interception, and counter-attack capabilities.
- **Comprehensive Coverage:** Shields strategic, civilian, and religious locations.
- **Advanced Technology:** Incorporates radar systems, AI-enabled tracking, cyber security measures, and physical security tools.
- **Indigenous Development:** Entirely designed, developed, and manufactured within India.
- **Long-Term Plan:** System expansion, modernisation, and capability enhancement aimed at 2035.

Significance:

- **Strategic Deterrence:** Offers protection akin to Israel's Iron Dome, tailored for India's unique threat environment.
- **National Sovereignty:** Reduces reliance on foreign defence systems.
- **Holistic Security:** Provides defence against conventional, hybrid, and cyber threats.

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Conclusion:
Mission Sudarshan Chakra strengthens India's defence self-reliance, ensures comprehensive protection of critical assets, and reinforces national security in the face of evolving threats.

National Deep Water Exploration Mission

Context:
On India's 79th Independence Day, the Prime Minister announced the **National Deep Water Exploration Mission**, aimed at enhancing offshore oil and gas discovery in regions like the Andaman Sea and the deep waters off Andhra Pradesh, with the goal of achieving energy self-reliance.

About the Mission:

- Flagship energy security initiative focused on exploring untapped oil and gas reserves beneath India's seabed.
- Operates in a mission-mode framework for efficient implementation.
- Led by the Ministry of Petroleum and Natural Gas.
- Supported by the Directorate General of Hydrocarbons (DGH) and other research institutions.

Objectives:

- Reduce reliance on imported crude oil and natural gas.
- Increase domestic hydrocarbon production capacity.
- Strengthen long-term energy security for India.
- Promote **Aatmanirbhar Bharat** in the energy sector.

Key Features:

- **Deep-Water Exploration:** Focus on previously unexplored offshore regions such as the Andaman-Nicobar basin and Andhra coast.
- **Policy Support:** Backed by the Open Acreage Licensing Policy (OALP) and recent legislative reforms favoring exploration.
- **Large-Scale Bidding:** Opens over 1 million sq km of previously restricted 'No-Go' areas for exploration.
- **Advanced Technology:** Utilises seismic surveys, modern drilling techniques, and AI-driven exploration tools.
- **Public-Private Partnership:** Encourages domestic and international investment in offshore exploration.

Significance:

- **Energy Independence:** Helps reduce India's crude oil import dependency (currently ~88%) and natural gas imports (~50%).
- **Economic Benefits:** Cuts import bills, freeing resources for infrastructure and social development.
- **Strategic Security:** Enhances control over domestic energy resources in a volatile global market.

Conclusion:
The National Deep Water Exploration Mission strengthens India's energy self-reliance, promotes technological advancement in offshore exploration, and ensures long-term economic and strategic security.

Intellectual Property Rights

Context
In recent years, India has made notable strides in strengthening its patent ecosystem. Policy reforms, government initiatives, and growing involvement of educational institutions have contributed to this progress. However, despite improvements, China continues to dominate global patent filings.

Patents and Intellectual Property Rights (IPRs)

- **What is a Patent?**
  A patent is a state-granted exclusive right for an invention, such as a new process, device, or pharmaceutical product. It prevents others from manufacturing, using, or selling the invention without the inventor's consent.
- **Patents vs. Other IPRs**
  Intellectual Property Rights encompass different forms:
  - **Copyrights** safeguard creative works like literature, films, and music.
  - **Trademarks** protect brand logos, names, or symbols.
  - **Geographical Indications (GIs)** identify goods linked to specific regions (e.g., Darjeeling Tea).
  - **Trade Secrets** secure confidential business information.

Patents focus on inventions and innovations with industrial application.

- **Legal Framework in India**
  The **Indian Patents Act, 1970**, governs patent registration and enforcement. The duration of patent protection is **20 years**, after which it enters the public domain.
- **Why do IPRs Matter?**
  - Encourage research, discoveries, and technological progress.
  - Strengthen the economy by boosting innovation-driven growth.
  - Ensure recognition and financial rewards for creators.
  - Provide a secure business environment that fosters investment in R&D.

Government Measures to Promote IPRs

- **National IPR Policy (2016):** Designed to make India a hub of creativity and innovation.
- **National IP Awareness Mission (NIPAM):** Expands understanding of patents, trademarks, and copyrights among students and professionals.
- **KAPILA (Kalam Program for IP Literacy and Awareness):** Encourages filing of patents and spreading IP knowledge.
- **Atal Innovation Mission (AIM):** Established under NITI Aayog to promote startups, incubation centres, and research-driven innovation.

India in the Global IPR Regime

India is part of several international agreements:

- **WIPO (World Intellectual Property Organization):** Oversees global IP administration.
- **WTO-TRIPS Agreement:** Provides a framework for minimum standards of IP protection across member states.
- **Budapest Treaty:** Relates to the deposit of microorganisms for patent procedures.
- **Marrakesh Treaty:** Ensures access to published works for visually impaired persons.

Shifts in India's Patent Landscape

- **Rising Domestic Filings:** Before 2000, less than 20% of patents were filed domestically. By 2023, Indian institutions accounted for nearly **57%** of filings.
- **Global Ranking:** In 2021, India overtook the USA in patent grants, ranking **second globally** after China.

Persistent Challenges

- **Low R&D Spending:** India invests only **0.67% of GDP** in research, far below global leaders.
  - **USA:** ~3.5%
  - **China:** ~2.5%
  This funding gap slows innovation and reduces the competitiveness of Indian patents.

Way Forward

- **Boost R&D Investment:** Raise expenditure to at least **2% of GDP** to accelerate innovation.
- **Commercialization of Patents:** Ensure inventions are successfully converted into market-ready products.
- **Streamline Licensing:** Simplify legal and administrative procedures for obtaining and utilizing patents.
- **Expand Patent Infrastructure:** Establish more patent offices and strengthen existing ones to reduce delays.

These steps are essential for India to enhance its position in the global innovation landscape, ensure long-term technological growth, and reduce dependence on external technologies.

Honor Killings in India

Context

Honor killings remain a serious challenge in India, with incidents reported even in relatively developed regions, including parts of South India.

What is an Honor Killing?

Honor killing refers to the murder of a family or community member, usually a woman, by relatives or community groups who believe that the individual's actions have tarnished family or social "honor." Such actions may include **inter-caste or inter-faith marriages, love marriages, rejection of arranged alliances, or sexual choices** not approved by the family.

Data and Underreporting

- **NCRB statistics:** 25 cases (2019) and 33 cases (2021).
- Actual numbers are believed to be **far higher**, as many cases are underreported or misclassified due to social stigma and

pressure from families or community groups.

Root Causes

- **Caste and Gotra Practices:** Marriages across caste lines or within the same gotra are often opposed by families.
- **Patriarchy:** Traditional male-dominated social structures restrict women's autonomy in choosing partners.
- **Khap Panchayats:** Informal caste councils frequently impose punishments against couples, reinforcing regressive norms.
- **Social Reputation:** Families prioritize "status" in society over the constitutional rights and choices of individuals.

Consequences

- **Violation of Fundamental Rights:** Honor killings directly contravene **Article 21 (Right to Life and Personal Liberty)** of the Constitution.
- **Psychological Damage:** Survivors and relatives often face long-term emotional trauma.
- **Weak Rule of Law:** Inadequate legal mechanisms and slow judicial processes allow offenders to escape strict punishment.
- **Gender Inequality:** Reinforces barriers to women's education, employment, and personal freedom, perpetuating social backwardness.

Legal Framework and Judicial Role

- **No Separate Law:** India does not have a dedicated statute on honor killings. Cases are prosecuted under **murder provisions** of the **Bharatiya Nyaya Sanhita (BNSS)** (previously IPC) , Sections 299–304 (murder), Section 308 (attempt to commit culpable homicide), and Sections 34–35 (common intention).
- **Legislative Attempts:** A specific bill was proposed in 2021 but has not been enacted.
- **Law Commission (242nd Report, 2012):** Recommended a special law to address honor crimes comprehensively.
- **Supreme Court Interventions:**
  - *Lata Singh vs. State of U.P. (2006):* Protected inter-caste couples from harassment.
  - *State of U.P. vs. Krishna Master (2010):* Advocated life imprisonment for honor killings.
  - *Arumugam Servai vs. State of Tamil Nadu (2011):* Held that parents cannot harass or forcefully punish children for inter-caste marriages.
  - *Shakti Vahini vs. Union of India (2018):* Landmark judgment declaring honor killings unconstitutional, directing state authorities to ensure safety of couples.

Way Forward

- **Dedicated Law:** Enact a **separate anti-honor killing law**, clearly defining offenses and responsibilities of law enforcement.
- **Fast-Track Justice:** Set up **special courts** for speedy trial of honor killing cases.
- **Strengthen Existing Laws:** Amend the **Special Marriage Act** and provisions of BNSS to explicitly recognize honor killings as distinct crimes.
- **Address Social Roots:** Public campaigns and educational reforms must target caste rigidity, patriarchal mindsets, and the legitimacy of Khap Panchayats.

These reforms, combined with strong legal measures and social change, are essential to protect individual freedoms guaranteed by the Constitution and to end the practice of honor killings in India.

SWAYAM Portal

Context

The Government of India launched SWAYAM (Study Webs of Active Learning for Young Aspiring Minds) in 2017 to provide affordable, quality education nationwide. Recently, five AI courses were added, enhancing digital learning and preparing students for future job markets.

What is SWAYAM?

- SWAYAM is a **Open Online Course (MOOC) platform** that hosts educational content from Class 9 to postgraduate levels.
- The initiative provides free learning opportunities, while certificates earned through course completion are recognized

by the **University Grants Commission (UGC)**.

Key Features

- Courses developed by leading faculty across India.
- Covers a wide range of disciplines: **Engineering, Science, Humanities, Commerce, Arts, Mathematics, Management, Education, and Languages**.
- Certificates enhance academic records and employability prospects.

SWAYAM Plus

An advanced version of the platform, managed by **IIT Madras**, focuses on skill development and industry-relevant learning.

- Provides content in around **12 Indian languages**.
- Integrates **AI-enabled guidance** and credit transfer facilities.
- Offers sector-specific courses in **manufacturing, computer science, management, energy, and healthcare**.
- Aims to connect education with **employability and job creation**.

Significance

- **Bridging Gaps**: Helps overcome geographical and economic barriers by making education accessible in remote areas.
- **Skill-Oriented**: With the inclusion of AI and industry-focused courses, learners acquire practical skills relevant to the modern economy.
- **Inclusive Learning**: Provides opportunities for both students and professionals to upgrade their knowledge base.
- **National Impact**: Supports the vision of a **Digital India** and strengthens the educational ecosystem.

Way Forward

- Expand regional language content to improve inclusivity.
- Strengthen collaboration with industries to ensure skill alignment with job markets.
- Promote awareness among rural and disadvantaged groups for wider reach.
- Develop AI-driven personalized learning to improve learner engagement.

Conclusion

The SWAYAM initiative promotes inclusive, future-ready education by offering quality academic and skill-based courses. It bridges the digital divide, boosts employability, and strengthens human capital, supporting India's vision of a knowledge-driven society.

Mount Elbrus

Context

Kabak Yano, a mountaineer from Arunachal Pradesh, recently scaled **Mount Elbrus**, drawing attention to this peak which holds global geographical significance.

Location & Significance: Mount Elbrus, in Southwestern Russia's Caucasus Range, lies between the Black and Caspian Seas and is the tallest peak in Europe.

Geological Origin: Formed as a fold mountain from Eurasian–Arabian plate collision.

Volcanic Nature: An extinct volcano.

Associated Features

- **Rivers**: Important rivers such as the **Baksan, Malka, and Kuban** originate from or flow close to Elbrus.
- **Glaciers**: Prominent glaciers include **Bolshoy or Zau Glacier** and **Irik Glacier**, which act as vital freshwater sources.

Mount Elbrus in the Seven Summits

Elbrus is part of the **Seven Summits Challenge**, which includes the highest peaks of each continent:

- **Asia** – Mount Everest
- **South America** – Aconcagua
- **North America** – Denali
- **Africa** – Kilimanjaro
- **Antarctica** – Vinson Massif
- **Australia** – Mount Kosciuszko
- **Europe** – Mount Elbrus

Revival of Coral Reefs

Context

Coral reefs in the **Gulf of Mannar, Tamil Nadu**, are showing signs of recovery after nearly two decades of restoration efforts .

What are Coral Reefs?

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- Coral reefs are **marine ecosystems** built from calcium carbonate secreted by corals.
- Often called the **"rainforests of the sea"**, they:
  - Support nearly **25% of marine biodiversity**.
  - Act as **natural barriers**, protecting coastlines from erosion.
  - Provide livelihoods through **fisheries and eco-tourism**.
- The **Gulf of Mannar reefs** stretch across **21 islands** and host species such as *Acropora*, *Montipora*, and *Porites*.

Causes of Coral Degradation

Anthropogenic Factors:

- Coral mining (1960s–1990s).
- Overfishing, destructive gear, and pollution.
- Coastal development leading to sedimentation.

Climate Change Factors:

- **Rising sea surface temperatures** → large-scale coral bleaching.
- **Ocean acidification**, reducing coral resilience.

Restoration Efforts

- Initiated in **2002** by the **SDMRI (Suganthi Devadason Marine Research Institute)** and the **Tamil Nadu Forest Department**.
- **Methods**:
  - Artificial substrates (concrete frames, clay pots, cement slabs).
  - Artificial Reef Modules – **Triangular (TARs)** and **Perforated Trapezoidal (PTARs)**.
  - 20 coral species transplanted; *Acropora* recorded the highest survival rates.

Outcomes of Restoration

- **Survival Rate**: 55–79%, with some species reaching **89% survival**.
- **Biodiversity Growth**: Coral recruits in TARs rose from **1.23 (2004)** to **24.77 (2020)**.
- **Fish Density Increase**: From **14.5 (2006)** to **310 (2020)** per 250 m².

Challenges to Coral Reefs

- **Repeated Bleaching**: Global warming continues to stress corals.
- **High Costs**: Coral transplantation requires skilled divers, resources, and long-term monitoring.
- **Genetic Imbalance Risk**: Dependence on fast-growing species like *Acropora* may reduce ecosystem resilience.
- **Ongoing Pressures**: Plastic pollution, coastal projects, and unregulated tourism further threaten reef health.

Way Forward

- **Scaling Up**: Expand restoration to other sites like the **Andaman, Lakshadweep, and Lakpat reefs**.
- **Community Engagement**: Train fishing communities as **reef guardians** for monitoring and sustainable practices.
- **Technology Integration**: Use **AI, drones, and remote sensing** for reef mapping and bleaching alerts.
- **Assisted Evolution**: Develop **heat-resistant coral strains** to reduce bleaching risk.
- **Global Cooperation**: Strengthen partnerships under **SDG-14 (Life Below Water)** and the **Paris Agreement** for funding and best practices.

Conclusion

The revival of reefs in the **Gulf of Mannar** demonstrates that a blend of **science, policy, and community involvement** can bring degraded ecosystems back to life. As a model for **climate resilience and biodiversity conservation**, it shows that sustained and innovative interventions can ensure that India's coral reefs continue to thrive as both an **ecological treasure** and a **source of livelihood**.

Indian Cotton Industry

Context:

India, a major cotton producer, faces a shortfall in domestic supply. To meet demand and reduce prices, the government has temporarily suspended import duties until September 30, 2025.

Importance of Cotton in India

- **Economic Significance:** Cotton remains a vital raw material for the textile sector.
- **Employment Contribution:**

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    - Approximately **6 million farmers** are directly engaged in cotton cultivation.
    - Around **40–50 million people** are connected to the cotton value chain, including processing, trade, and textile manufacturing.
    - Within India, the cotton textile sector ranks as the **second-largest employer** after agriculture.
- **"White Gold":** Cotton is often referred to as "white gold" due to its economic value.

Cotton Cultivation in India

- **Global Position:**
    - India leads globally in terms of the **area under cotton cultivation**.
    - In terms of total cotton output, India ranks **second**, behind China.
    - India is also the **second-largest consumer** of cotton worldwide.
- **Productivity Challenges:** Despite large cultivation areas, India's yield per hectare is relatively low compared to countries like the USA, China, and Brazil. This necessitates occasional imports to meet demand.
- **Major Cotton-Producing Regions:**
    - **North:** Punjab, Haryana, Rajasthan
    - **Central:** Gujarat, Maharashtra, Madhya Pradesh
    - **South:** Telangana, Andhra Pradesh, Karnataka
    - Gujarat is the **largest cotton-producing state**, while nearly **two-thirds of cotton-growing areas** depend on rainfall, particularly in central and southern India.
- **Key Import Sources:** Australia, the USA, Brazil, and Egypt are the main countries from which India imports cotton.

Botanical Details and Varieties

- **Scientific Name:** *Gossypium spp.*
- **Cotton Species Worldwide:** Four primary species are cultivated globally, and India uniquely grows all four:
    - **Asian Cotton:** *G. arboreum* and *G. herbaceum*
    - **Egyptian Cotton:** *G. barbadense*
    - **American Cotton:** *G. hirsutum*
- **BT Cotton:**
    - A genetically modified (GM) hybrid derived from *G. hirsutum*.
    - Developed to resist the Pink Bollworm pest, which has historically caused major crop losses.
    - Uses **Bollgard-1 and Bollgard-2 technologies**.
    - Commercially approved for cultivation in India.
    - These technologies are referenced in GM crop development.

Government Initiatives

- **Mission for Cotton Productivity:**
    - Launched as a **five-year mission** in the 2025–26 budget.
    - Implemented by the **Ministry of Textiles**.
    - Focuses on improving cotton yield and promoting **extra-long staple (ELS) cotton**, reducing reliance on imports.
    - Includes the **"5F Vision"**: Farm to Fibre, Fibre to Factory, Factory to Fashion, Fashion to Foreign.

Conclusion:

This temporary measure supports affordability and availability, stabilizing the cotton market. It underscores the government's commitment to the textile sector, farmers' welfare, and meeting domestic demand while enhancing India's global cotton competitiveness.

Regulation of Coal Operations

Context:

In August 2025, a report highlighted that coal will remain central to India's energy system, emphasizing environmental and health challenges, the need for Health Impact Assessments, and active community participation in mining regions.

India's Dependence on Coal

Reasons for Heavy Reliance

1. **Energy Security:** Coal accounts for over 70% of India's power generation capacity (2022–23). Domestic coal reserves (~350 billion tonnes) provide energy sovereignty

compared to imported oil and gas.

2. **Industrial Support:** Thermal power underpins key industries like steel, cement, aluminium, fertilisers, and railways. Coal-based energy remains cost-competitive amid global energy price volatility.
3. **Affordability & Infrastructure:** Coal-fired plants are relatively inexpensive to build and have long operational lifespans. Existing transport networks, coal-handling systems, and state utilities create a strong dependency.
4. **Employment:** Millions of livelihoods depend on coal mining, especially in Jharkhand, Chhattisgarh, Odisha, and West Bengal, making a rapid transition politically sensitive.
5. **Renewables Limitations:** Solar and wind face intermittency issues and require grid storage solutions. Coal remains the reliable baseload source.
6. **Transition Challenges:** Limited financing, technology gaps, and lack of social adaptation plans hinder rapid decarbonisation.

Environmental and Health Impacts

- **Air Pollution:** PM10 levels in coal towns like Jharia and Ennore exceed safe limits fivefold.
- **Water Contamination:** Fly ash seepage affects rivers and soil fertility.
- **Biodiversity Loss:** Mining disrupts forests and wildlife corridors.
- **Public Health:** Respiratory disorders, silicosis, and neurological problems have been linked to coal-related pollutants.
- **Livelihood Disruptions:** Farming, fisheries, and livestock are severely impacted, causing poverty and migration.

Governance and Regulatory Challenges

- **Weak Enforcement:** Manipulation of emissions at some power plants has been observed.
- **Inconsistent Compensation:** Farmers in mining regions often receive delayed or inadequate payouts.
- **Neglect of Forest Rights:** Tribal and forest communities are frequently excluded from decision-making under the Forest Rights Act (2006).
- **Limited Community Involvement:** Local voices are rarely represented in oversight or restoration committees.

Recommendations from the Report

1. **Health Impact Assessments (HIAs):** Should be integrated with Environmental Impact Assessments in coal regions.
2. **Community Participation:** Establish local oversight committees including villagers, NGOs, and experts.
3. **Continuous Monitoring:** Independent audits of air, water, soil, and health indicators.
4. **Mission-Mode Restoration:** Ministries and states should prioritise environmental clean-up.
5. **Just Transition Strategy:** Plans should ensure social equity, livelihood alternatives, and skill development for coal workers.

Way Forward

- **Diversify Energy Mix:** Expand solar, offshore wind, and green hydrogen to reduce coal dependence.
- **Just Transition Fund:** Provide financial support for worker rehabilitation and alternative livelihoods in mining regions.
- **Health-Centric Planning:** Institutionalise HIAs in project approvals.
- **Strengthen Accountability:** Empower NGT and Pollution Control Boards with community oversight powers.
- **Circular Economy:** Encourage fly ash reuse in construction, bricks, and cement.
- **International Climate Finance:** Leverage global funds and partnerships like the Green Climate Fund and JETPs.

Conclusion

Coal will remain central to India's energy system, but sustainable energy, public health, and social equity require strict regulation, community participation, and a just transition balancing economic growth with environmental responsibility.

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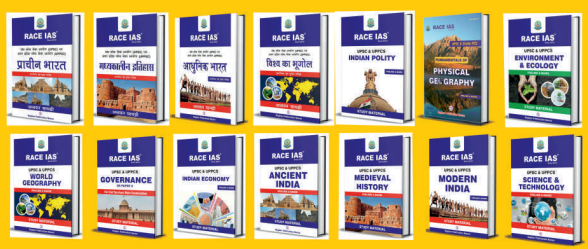

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