CHECK PARTIES

April 07-13, 2024

Rare Solar Eclipse in North America



India-EU Collaboration on EV Battery Recycling



HIGHLIGHTS

- PMLA
- Higgs Boson
- India's EarlyWarningSystem

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1



Gulf Cooperation Council Vision for Regional Security

Why in News?

Adoption of a comprehensive regional security framework called the Vision in December 2023.

Key Highlights

- Principles: Based on shared destiny and indivisible security, treating threats to any member state as a threat to all.
- Conflict Resolution: Prioritizes negotiation and dialogue over force.
- Counterterrorism: Urges combat against terrorism, extremism, and money laundering.
- Non-Proliferation: Supports efforts for a region free of weapons of mass destruction.
- Arab Peace Initiative: Calls for activating the two-state solution for the Palestinian cause.

Priority Areas

- Addressing security concerns like climate change, water and food security, and energy security.
- Creating investment opportunities for economic growth.



Significance

- A proactive approach to regional stability and prosperity.
- Provides a platform for resolving longstanding conflicts, especially the Palestinian issue.

Implementation Strategies

- Formulating action plans and initiatives for effective implementation.
- Establishing mechanisms for ongoing dialogue and cooperation among member states.

Conclusion

Adoption of the Vision marks a significant step towards cooperation and stability, emphasizing conflict resolution and shared prosperity.



Rare Solar Eclipse in North America

Occurrence

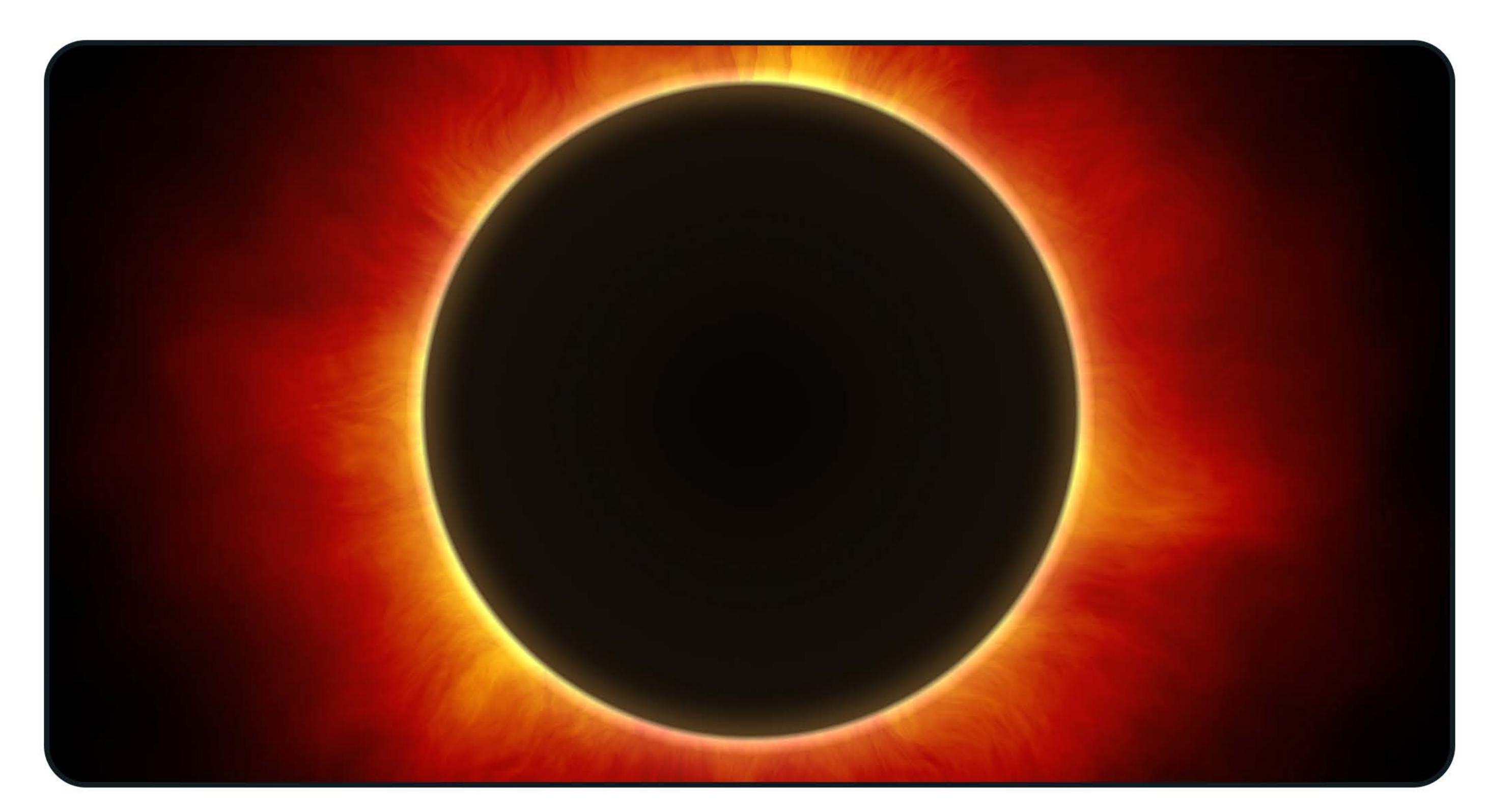
A total solar eclipse traversed North America, passing over Mexico, the United States, and Canada. This event, although not visible in India, is considered rare for any specific location.

Understanding Solar Eclipses

Definition: A solar eclipse occurs when the Moon moves between the Earth and the Sun, blocking the Sun's light either fully or partially, and casting a shadow on some parts of the world.

Types of Solar Eclipses:

- Total Solar Eclipse: Moon completely blocks the Sun, witnessed in the center of the Moon's shadow.
- Annular Solar Eclipse: Moon passes in front of the Sun but is near the farthest point from Earth.
- Partial Solar Eclipse: Moon blocks only a portion of the Sun, creating a crescent shape.
- Hybrid Solar Eclipse: Eclipse shifts between annular and total solar eclipses as the Moon's shadow moves across the globe.



Frequency of Solar Eclipses

- Occurrence: Solar eclipses happen only during a **new Moon phase**, which occurs approximately every 29.5 days. However, solar eclipses happen between two to five times annually due to the inclination of the Moon's orbit relative to Earth's orbit around the Sun.
- Nodes: Nodes are points where the Moon's orbit intersects Earth's orbit around the Sun. Solar eclipses occur when the new Moon crosses one of these nodes.

Rare Occurrence of Total Solar Eclipses

Frequency: Total solar eclipses at a specific location on Earth happen approximately once every 400 years. This rarity is because the umbral shadow, the darkest part of the lunar shadow where a total eclipse is visible, covers less than 1% of the Earth's surface during an eclipse.



PIVILA

Why in News?

The Congress party released its manifesto, titled "Nyay Parra," for the Lok Sabha election, which included promises to address issues related to the weaponization of laws and arbitrary arrests.

Congress's Manifesto Promises

- End to Weaponization of Laws: The Congress pledged to end arbitrary searches, seizures, and arrests, and promised to enact a law on bail that emphasizes bail as the rule and jail as the exception in criminal laws.
- Veiled Reference to Enforcement Directorate (ED) Actions: The manifesto's chapter on "Saving Democracy, Removing Fear, Restoring Freedom" in the section "Defending the Constitution" indirectly referred to the actions of the Enforcement Directorate (ED) and the Prevention of Money Laundering Act (PMLA), 2002.

Background on PMLA

- Enactment: The Prevention of Money-Laundering Bill, 1998, was introduced by the Atal Bihari Vajpayee government to combat money laundering and related activities.
- Amendments: Significant amendments in 2009 and 2012 granted the Enforcement Directorate (ED) powers to take coercive action against politicians accused of corruption.

Key Amendments and Impact

- 2009 Amendments: Included 'criminal conspiracy' under Section 120B of the Indian Penal Code (IPC) in the PMLA's schedule, granting ED jurisdiction over cases where conspiracy is alleged, even if the primary offense is not part of the PMLA's schedule.
- 2012 Amendments: Moved the Prevention of Corruption Act, 1988 (PC Act), to Part A of the PMLA's schedule, imposing stringent bail conditions on those accused of corruption. This resulted in extended pre-trial incarcerations for several politicians.





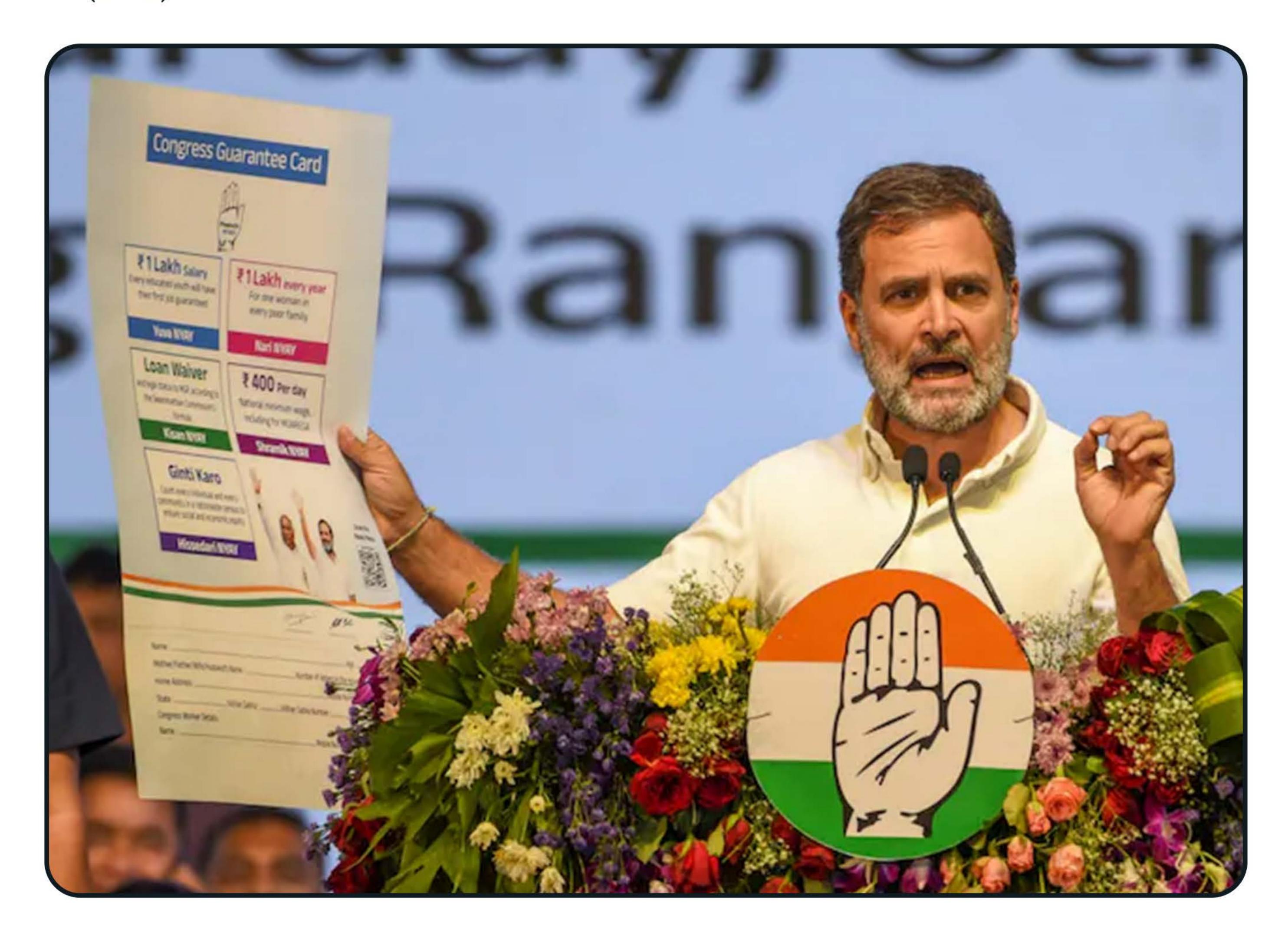
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Controversies and Criticisms

- **Extended Incarcerations:** The stringent provisions of the PMLA have led to prolonged incarcerations without trial for politicians, raising concerns about fairness and justice.
- **Expanded Definition of Money Laundering:** Amendments enlarged the definition of money laundering to include various activities, making individuals culpable even if unaware that funds were tainted.

Supreme Court Ruling

Constitutional Validity: In 2022, the Supreme Court upheld the constitutional validity of the PMLA, affirming the sweeping powers of the ED, including its authority to conduct searches, seizures, and arrests outside the purview of the Code of Criminal Procedure (CrPC).



India-EU Collaboration on EV Battery Recycling

Why in News?

- The collaboration took place under the India-EU Trade and Technology Council (TTC), which was established in 2023 following its proposal by the European Commission and India in 2022.
- Objective: The initiative aims to enhance cooperation between European and Indian Small and Medium-sized Enterprises (SMEs) and start-ups in the clean and green technologies sector, focusing particularly on electric vehicle (EV) start-ups.

Significance of EV Battery Recycling

Significance	Details
Resource Recovery	EV battery recycling aims to recover non-renewable materials such
	as lithium, nickel, and zinc, contributing to resource conservation.
Environmental	Recycling batteries minimizes waste and reduces environmental
Protection	impact by promoting waste minimization and circular economy principles.
Cost Reduction	Promoting battery recycling reduces the cost of manufacturing new batteries, supporting economic efficiency and sustainability.
Regulatory	India has set ambitious recovery targets, aiming to achieve a 90%
Targets	recovery rate by 2026-27 under the Battery Waste Management Rules, 2022.

Challenges in EV Battery Recycling

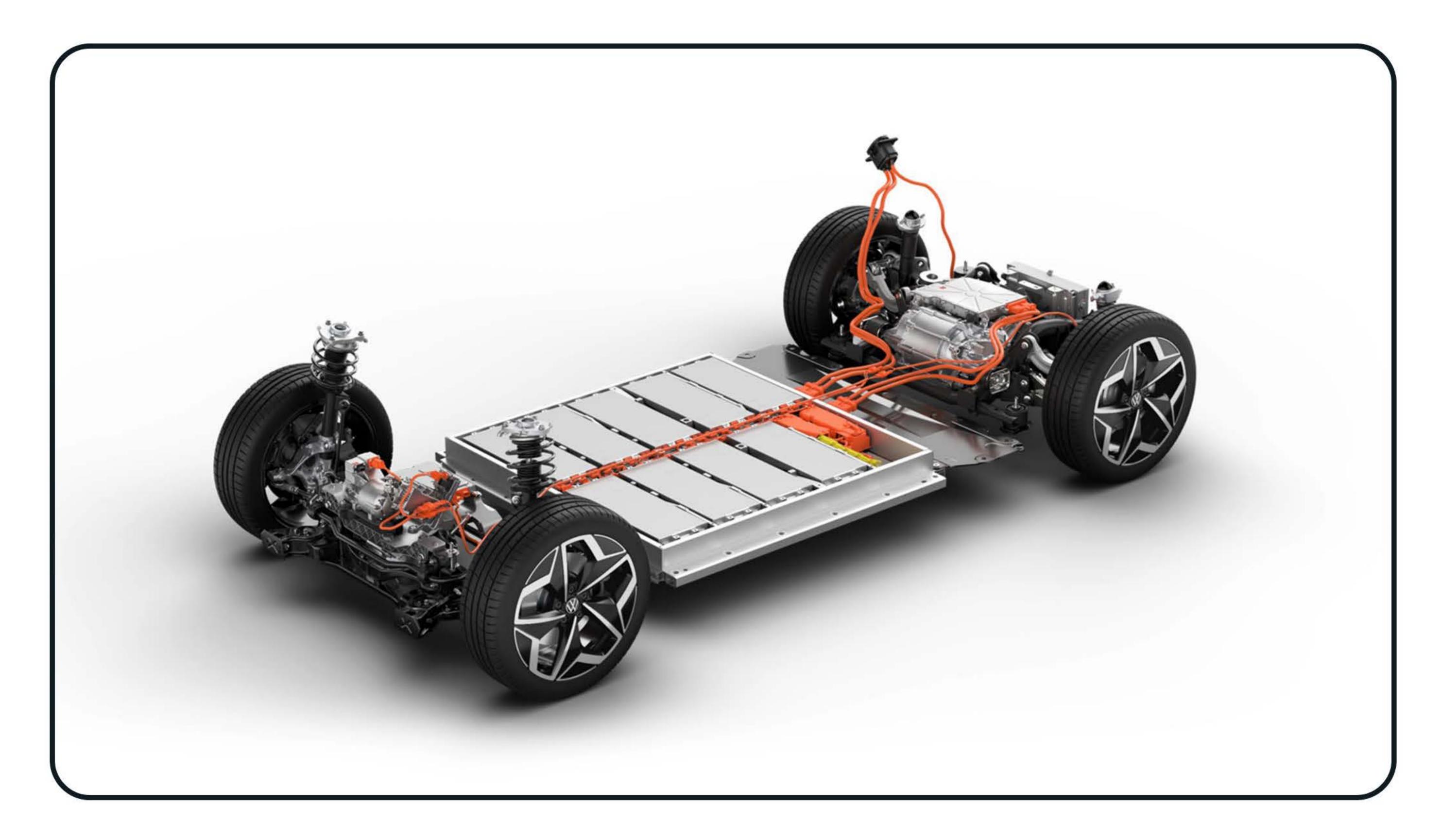
Challenges	Details
Lack of Proper Disposal Infrastructure	The majority of India's used batteries end up either in landfills or are processed by the unorganized sector due to the absence of a formal disposal and recycling program.
Infrastructure and Process Standardization	The absence of standardized processes and infrastructure complicates the recycling process.
Safety Concerns	The complexity of battery chemistry and flammability pose safety risks during recycling.
Economic Viability	High recycling costs impact the economic viability of recycling units, posing challenges to sustainable recycling practices.



India's Initiatives

Battery Waste Management (Amendment) Rules, 2023: The rules mandate phased targets for incorporating recycled material in new battery products, with the aim of achieving 20% usage by 2030-31 for both portable and EV batteries.

Extended Producer Responsibility: The rules provide for transactable Extended Producer Responsibility certificates for producers, incentivizing environmentally sound management of waste batteries based on the weight of batteries processed.



Peter W. Higgs and the Nobel Prize in Physics (2013)

Why in News?

Peter W. Higgs and Francois Englert jointly received the Nobel Prize in Physics in 2013 for their theoretical discovery regarding the origin of subatomic particle mass.

Discovery of Higgs Boson

- Theoretical Prediction: In 1964, Peter W. Higgs theorized the existence of the Higgs Boson, a fundamental particle associated with the Higgs field.
- Experimental Confirmation: The Higgs Boson was discovered in 2012 at the Large Hadron Collider (LHC) in Switzerland, the world's largest particle accelerator.

Understanding the Higgs Boson

Fundamental Particle: The Higgs Boson is intricately linked with the Higgs field, a concept that provides mass to other fundamental particles.

Interaction with Higgs Field:

Particles like electrons and protons interact with the Higgs field, acquiring mass as a result.

Photons, being massless, do not interact with the Higgs field.

The Higgs boson itself interacts with the Higgs field, contributing to its mass.

Conceptual Significance: The concept of the Higgs field and the discovery of the Higgs boson have profound implications for our understanding of the fundamental workings of nature.

Other Fundamental Particles

- Fermions: Fermions, comprising quarks and leptons, serve as the basic building blocks of matter.
- Bosons: Bosons, responsible for carrying energy and forces, play a crucial role in the universe's fundamental interactions.

Preliminary Signs of Fragmentation in Trade Flows

Why in News?

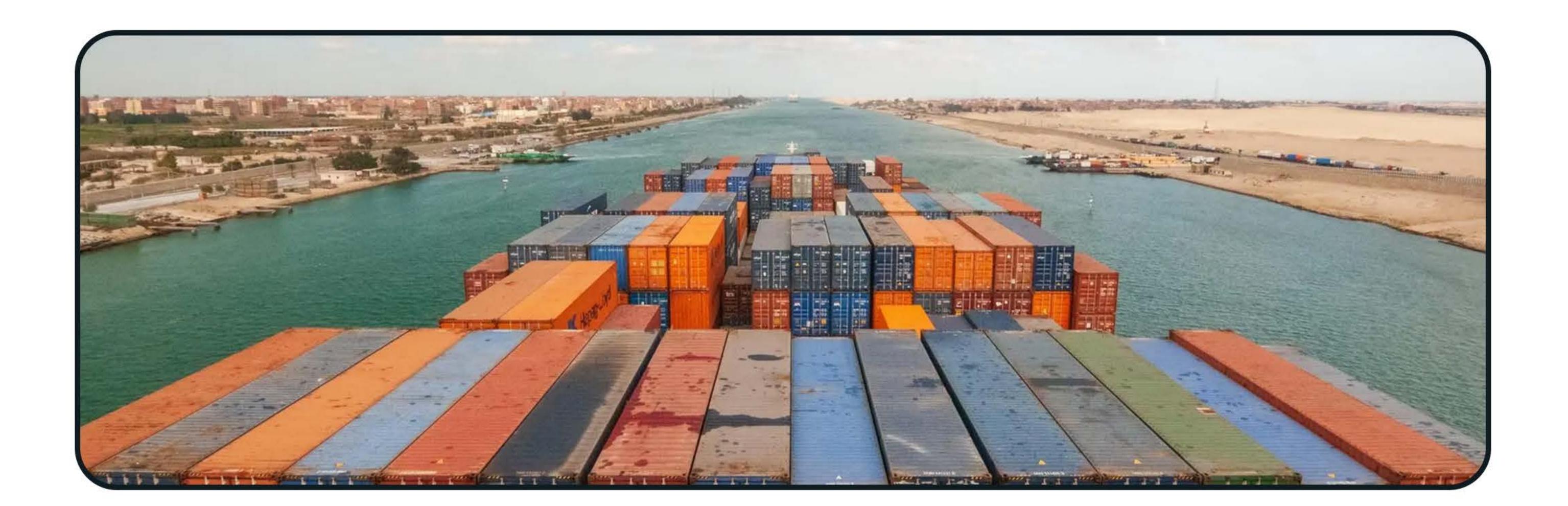
- Trade Trends: In 2023, there was a noticeable decline of 6% in the trade of intermediate goods, whereas trade in non-intermediates remained stagnant.
- Shift in Trading Partners: China's share of parts and accessories from Asian trading partners decreased slightly, dropping from 62.8% in 2019 to 60.2%.

Impact of Shipping Disruptions:

- Panama Canal: Responsible for handling 6% of global trade, it is currently operating at reduced capacity due to freshwater shortages.
- Suez Canal: Facilitating about 12% of global trade, it faces challenges due to vessel attacks, resulting in diversions around the Cape of Good Hope and adding approximately 10 days to Asia-Europe journeys.

Fragmentation in Services

- Potential Impact: Concerns arise regarding disruptions in data flow.
- Evidence of "Friendshoring": Notable shifts are observed in ICT services, with US imports from Asia (particularly India) decreasing to 32.6% from 45.1%, while those from North America have increased.
- Explanation of "Friendshoring": This trade practice involves a country's supply chain networks being concentrated on political and economic allies.



Initiatives to Boost Global Supply Chain and Trade

- Supply Chain Resilience Initiative (SCRI): Launched by India, Japan, and Australia to enhance supply chain resilience.
- India-Middle East-Europe Economic Corridor: Aimed at connecting India to the Gulf and further to Europe, fostering economic ties.
- Indo-Pacific Economic Framework for Prosperity (IPEF): Designed to strengthen economic engagement among partner countries in the Indo-Pacific region.



India's Efforts in Developing Early Warning Systems (EWS)

Why in News?

Initiative Overview: India is assisting Nepal, Maldives, Sri Lanka, Bangladesh, and Mauritius in establishing Early Warning Systems (EWS) to mitigate the impact of extreme weather events. This effort aligns with the 'Early Warnings for All (EW4All)' initiative, introduced by the UN in 2022.

About EW4AII:

Objective: The initiative aims to **safeguard individuals from hazardous weather,** water, or climate events by implementing EWS worldwide by the end of 2027.

Leadership: Spearheaded by the World Meteorological Organization (WMO) and the United Nations Office for Disaster Risk Reduction (UNDRR).

Financial Requirements: Requires investments totaling USD 3.1 billion between 2023 and 2027 to bolster four key pillars of EWS.

Importance and Need for EWS

Protection of Lives and Livelihoods: Data indicates that approximately 2 million deaths and economic losses amounting to USD 4.3 trillion occurred due to disasters between 1970 and 2021.

Enhanced Preparedness: EWS implementation improves readiness and helps mitigate the impact of natural hazards.

Addressing Climate Change Challenges: With climate change contributing to increased frequency of disasters, establishing robust EWS becomes imperative. Projections suggest the world may face up to 560 medium- to large-scale disasters each year.



Challenges Associated with EWS

- Coordination Issues: Lack of coordination between data collection and warning dissemination centers poses challenges.
- Communication Barriers: Language barriers hinder effective communication of early warnings to affected populations.

Way Forward for Strengthening EWS

- Improving Data Quality: Focus on enhancing the quality of data and ensuring global access to relevant information.
- Integration of Knowledge: Integrate scientific and technological advancements with local, traditional, Indigenous, and generational knowledge for comprehensive disaster preparedness.



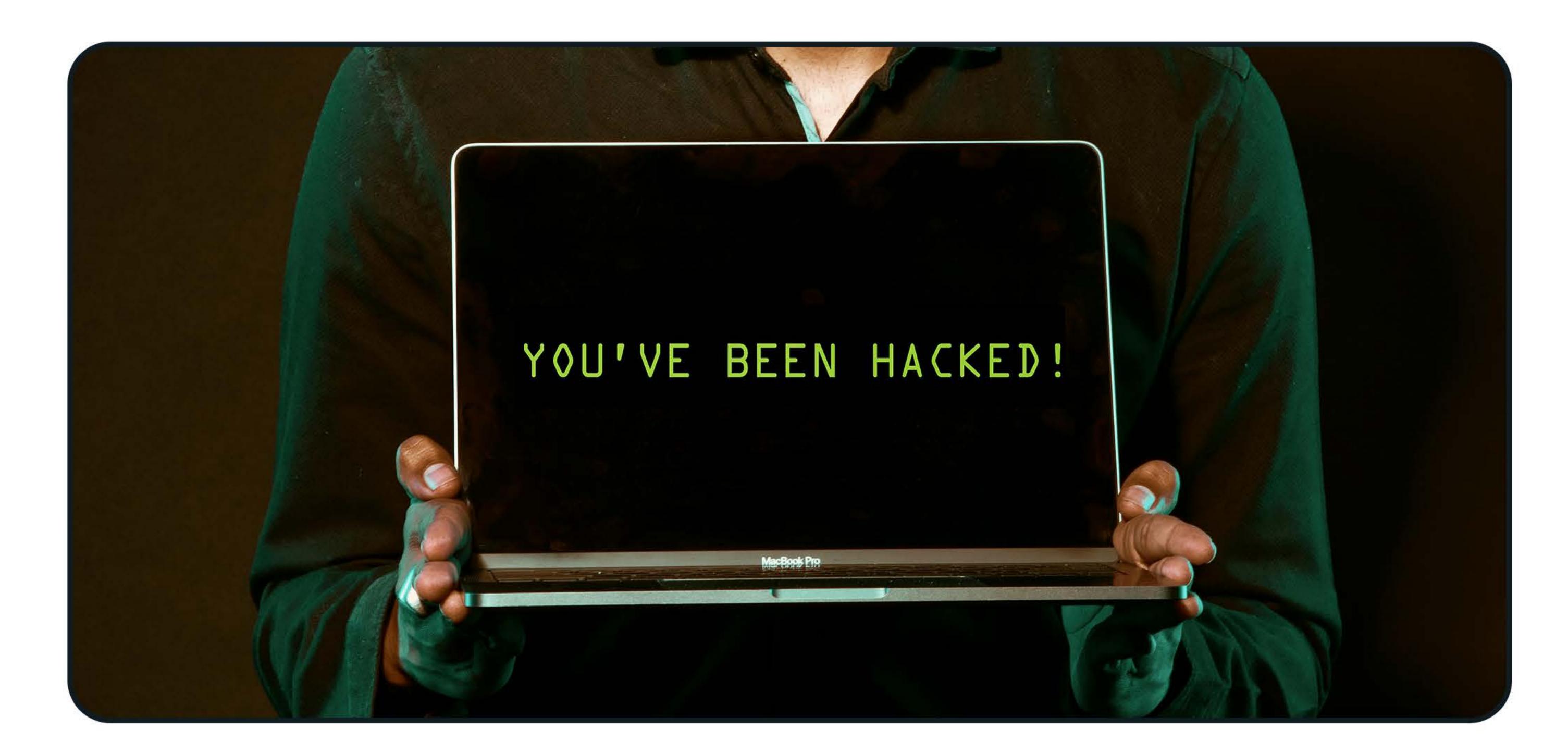
Rising Cybersecurity Risks in the Financial Sector

IMF Report Findings:

- Risk of extreme losses from cyber incidents has surged to \$2.5 billion.
- The number of cyberattacks has nearly doubled since the onset of the COVID-19 pandemic.
- Financial firms, particularly banks, are the primary targets, accounting for nearly one-fifth of all cyber incidents.

Reasons Behind Rising Cyber Incidents

- Increased Digital Financial Services: Expanded digital financial services create a lucrative target for hackers.
- Insider Threats: Users with authorized access to assets may misuse their privileges, either intentionally or accidentally, for personal gain.
- Cybersecurity Skills Gap: Financial firms face vulnerability due to a shortage of cybersecurity professionals.
- Geopolitical Tensions: Escalation in cyber-attacks often follows **geopolitical conflicts**, such as Russia's invasion of Ukraine.



Impact of Cyber Attacks on Macro-financial Stability

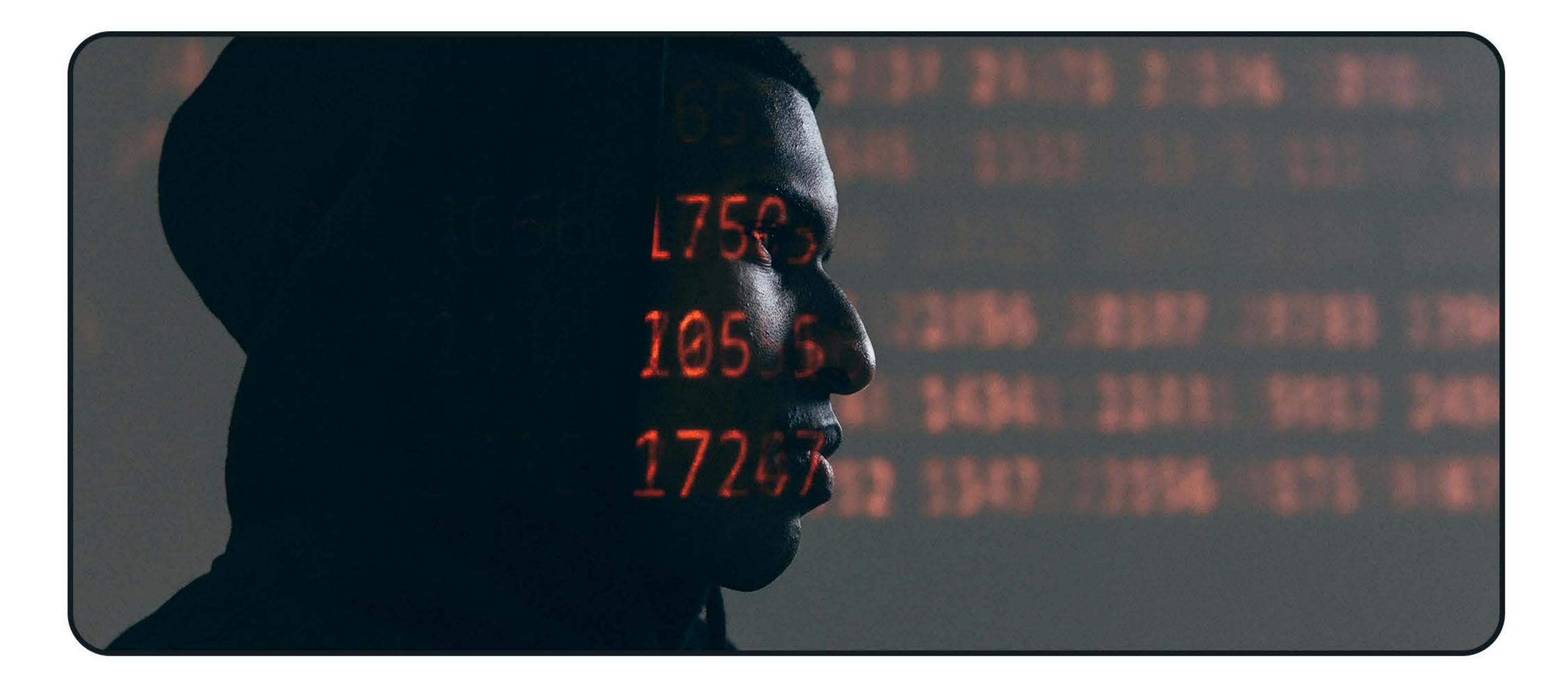
- Loss of Confidence: Data breaches can erode confidence in the affected institution, leading to significant deposit outflows.
- Disruption of Financial Services: Cyber-attacks on payment networks can disrupt trading, online banking, and undermine a country's financial stability.
- Propagation of Attacks: Cyber incidents spread rapidly within interconnected financial systems, affecting overall market stability.

Policy Recommendations

- Enhanced Reporting: Financial firms should strengthen the reporting of cyber incidents to supervisory agencies for better oversight.
- Response Procedures: Develop and test response and recovery procedures to ensure operational resilience in the face of cyber incidents.

World Cybercrime Index

- Developed in partnership between the University of Oxford and UNSW Canberra.
- India ranks 10th in cybercrime, with advance fee payment frauds being the most prevalent.
- Russia tops the list, followed by Ukraine and China.



Plastic Waste Management (Amendment) Rules 2024

Why in News?

The Environment Ministry has brought forth the Plastic Waste Management (Amendment) Rules 2024, aimed at modifying the Plastic Waste Management Rules of 2016.

Key Highlights

- Biodegradable plastics are defined as those capable of biological degradation and leaving no microplastics.
- The updated rules do not specify testing methods for microplastic absence or reduction thresholds.
- Manufacturers can utilize compostable or biodegradable plastics for carry bags and commodities, following FSSAI regulations for mandatory labeling.
- Before marketing compostable or biodegradable plastic products, manufacturers must obtain a certificate from CPCB.
- Manufacturers are required to process pre-consumer plastic waste and report to the relevant State Pollution Control Board or Pollution Control Committee.

Extent of Plastic Waste

- Annually, over 400 million tonnes of plastic are produced, with half designed for single use.
- Less than 10% of plastic is recycled, leading to an estimated 19-23 million tonnes entering water bodies yearly.
- Globally, 1 million plastic bottles are purchased every minute, and up to 5 trillion plastic bags are used annually.



Fertility Rate in India

Why in News?

- Recent studies in Lancet highlight a significant decline in India's total fertility rate (TFR).
- Global fertility rates are under scrutiny, with projections indicating a majority of countries falling below replacement levels by 2050 and beyond.

Total Fertility Rate (TFR) Overview

- TFR represents the average number of children a woman would have in her lifetime.
- Calculated by summing age-specific fertility rates across various age groups.

Global Fertility Trends

- By 2050, around 76% of countries globally are forecasted to dip below replacement fertility levels.
- By 2100, this trend is expected to escalate, with about 97% of countries and territories falling below replacement level.

Fertility Decline in India

- India's TFR dropped from 6.18 in 1950 to 1.91 in 2021.
- Projections foresee a further decline to 1.29 by 2050 and 1.04 by 2100.
- Live births, which numbered over 1.6 crore in 1950 and exceeded 2.2 crore in 2021, are projected to decrease to 1.3 crore by 2050.



Factors Influencing Fertility Decline

- Economic Factors: Cost of raising children, opportunity cost of parenthood.
- Sociocultural Shifts: Delayed marriage, changing family structures.
- Access to Education and Career Opportunities: Urbanization, changing lifestyles.
- Healthcare Advancements and Contraception Availability: Higher workforce participation, especially among women.
- Government Policies and Support: Family planning initiatives, maternity leave provisions.

Impact of Fertility Decline

- Implications on population growth, demographics, and social dynamics.
- Economic repercussions, workforce dynamics, and dependency ratios.

Conclusion

The declining fertility trend in India and globally has multifaceted implications, necessitating comprehensive policy responses and societal adaptations.



Predictive Al

Why in News?

The emergence of predictive Al is transforming the way businesses analyze data, make decisions, and maintain a competitive edge in their industries.

What is Predictive Al?

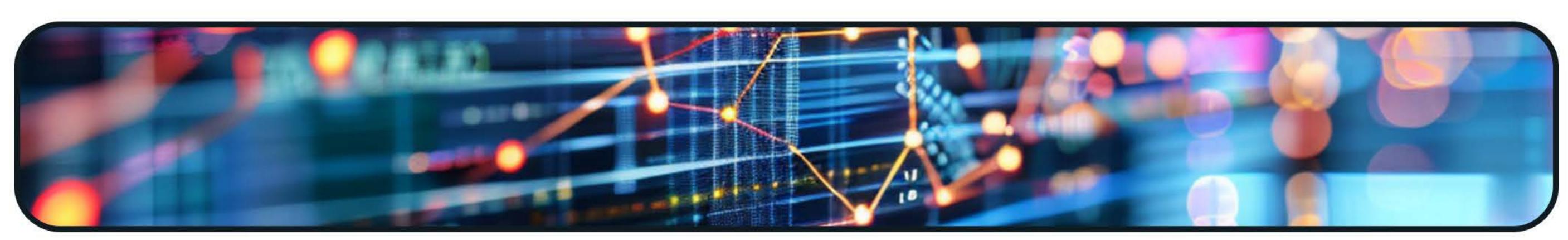
- Predictive Al utilizes machine learning to recognize patterns in historical data and forecast future events.
- lt transcends traditional data analysis, converting data into predictive assets.
- Organizations leverage predictive Al to anticipate outcomes and market shifts.
- Strategic decisions are made with unparalleled foresight thanks to predictive Al capabilities.

How does Predictive Al Work?

- Big data: Accessing extensive data sets is essential.
- Machine learning (ML): Applied to vast data collections in predictive Al.
- ldentifying patterns: Predictive Al examines hundreds or thousands of factors to detect recurring patterns indicative of future events.

Predictive Al Applications

- Predictive Al analyzes severe weather events like volcanic eruptions, aiding in predicting disruptions in air travel.
- Yandex, based in Moscow, has launched an interactive map for real-time monitoring of ash clouds post-eruptions.
- In oil and gas exploration, predictive Al uses historical geological data to forecast potential drilling locations.
- Saudi Aramco utilizes predictive Al, such as metabrain generative Al, to analyze drilling strategies and geological data for precise predictions.
- Predictive Al models are applied in medical research, especially in drug discovery, to foster collaboration and enhance data analysis.





Misuse of Social Media

Supreme Court's Denouncement

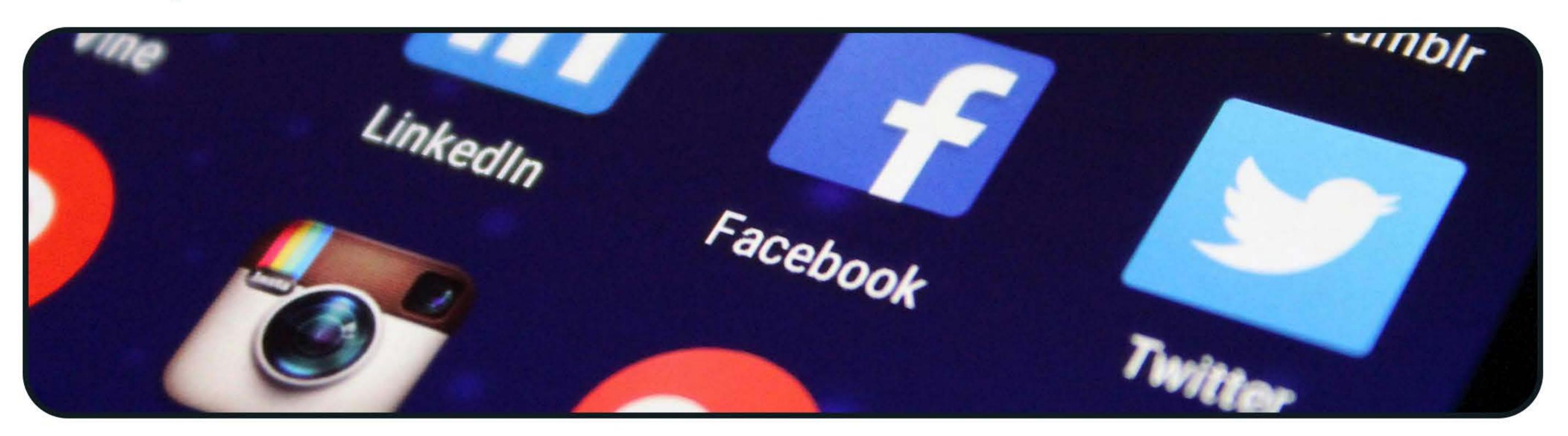
SC criticizes the spread of factually incorrect and unfounded statements regarding pending cases on social media platforms.

Reasons for Misuse of Social Media

- Internet Growth: Expansion of the internet, coupled with anonymity, facilitates the spread of misinformation.
- Increased User Base: Growing numbers of users contribute to the dissemination of false narratives.
- Ambiguity in Law: Lack of clarity on the responsibility of social media platforms in regulating content.
- Rise of Artificial Intelligence: Technologies like deepfake contribute to the proliferation of false information.
- Absence of Grievance Redressal Mechanisms: Inadequate systems for addressing complaints of misinformation.

Negative Impacts of Misuse

- Prejudiced Narratives: Spread of biased or incomplete information leading to misinformed public opinions.
- Excessive Trolling: Unjustified criticism and harassment directed at individuals or groups.
- Defamation and Invasion of Privacy: Morphed images, revenge porn, and disrespect for religious sentiments contribute to social discord.
- Fear of Bias in Judicial Decisions: Pressure on courts to align with public sentiment, potentially influencing fair trial procedures.
- Others: Incitement of violence, financial frauds, and dissemination of disharmony in society.



Steps Taken by Government to Curb Misuse

- IT Rules 2021: Introduction of Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules to regulate online content.
- Fact Check Unit: Establishment of PIB's Fact Check Unit under IT Rules 2021 to verify and counter misinformation.
- Advisories to Intermediaries: Government advisories mandating intermediaries to communicate prohibited content and take appropriate action.
- Regulation of OTT Platforms: Blocking of OTT platforms publishing obscene or vulgar content to uphold ethical standards.

Way Forward

- Investment in Research and Development: Funding research to enhance detection techniques for deepfake content.
- Collaboration: Foster collaboration between governments, tech companies, and civil society organizations to address the challenges of misinformation effectively.



Hydrogel for Microplastic Degradation

Innovation

Development of a hydrogel with a unique polymer network for binding and degrading microplastics using UV light irradiation.

Composition of Hydrogel

- Polymer Layers: Consists of three different polymer layers chitosan, polyvinyl alcohol, and polyaniline.
- Nanoclusters: Incorporates nanoclusters of copper substitute polyoxometalate (Cu-POM) acting as a catalyst for UV-induced degradation.

About Microplastics

Definition: Small plastic fragments typically less than 5 millimeters long.

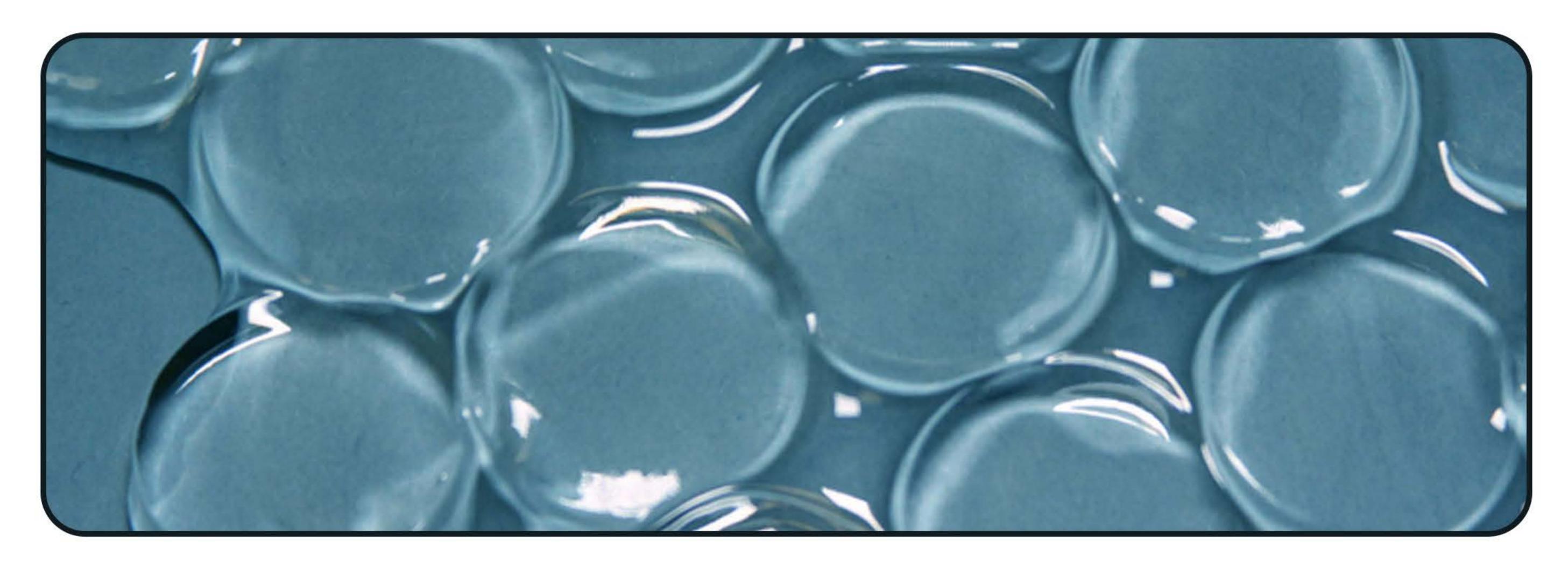
Categories:

Primary: Tiny particles designed for commercial use (e.g., microbeads in cosmetics), microfibers from textiles.

Secondary: Particles resulting from the breakdown of larger plastic items due to environmental factors.

Impacts

- Environmental: Consumption by marine organisms, leading to disruption of the food chain; reaching remote areas like Antarctica.
- Human Health: Gastrointestinal issues, endocrine disruption, respiratory problems, and allergies.



Initiatives Taken

Global

GPML: Global Partnership on Plastic Pollution and Marine Litter, launched at the Rio+20 Summit in 2012.

MARPOL: International Convention for the Prevention of Pollution from Ships, adopted by the International Maritime Organization in 1973.

India

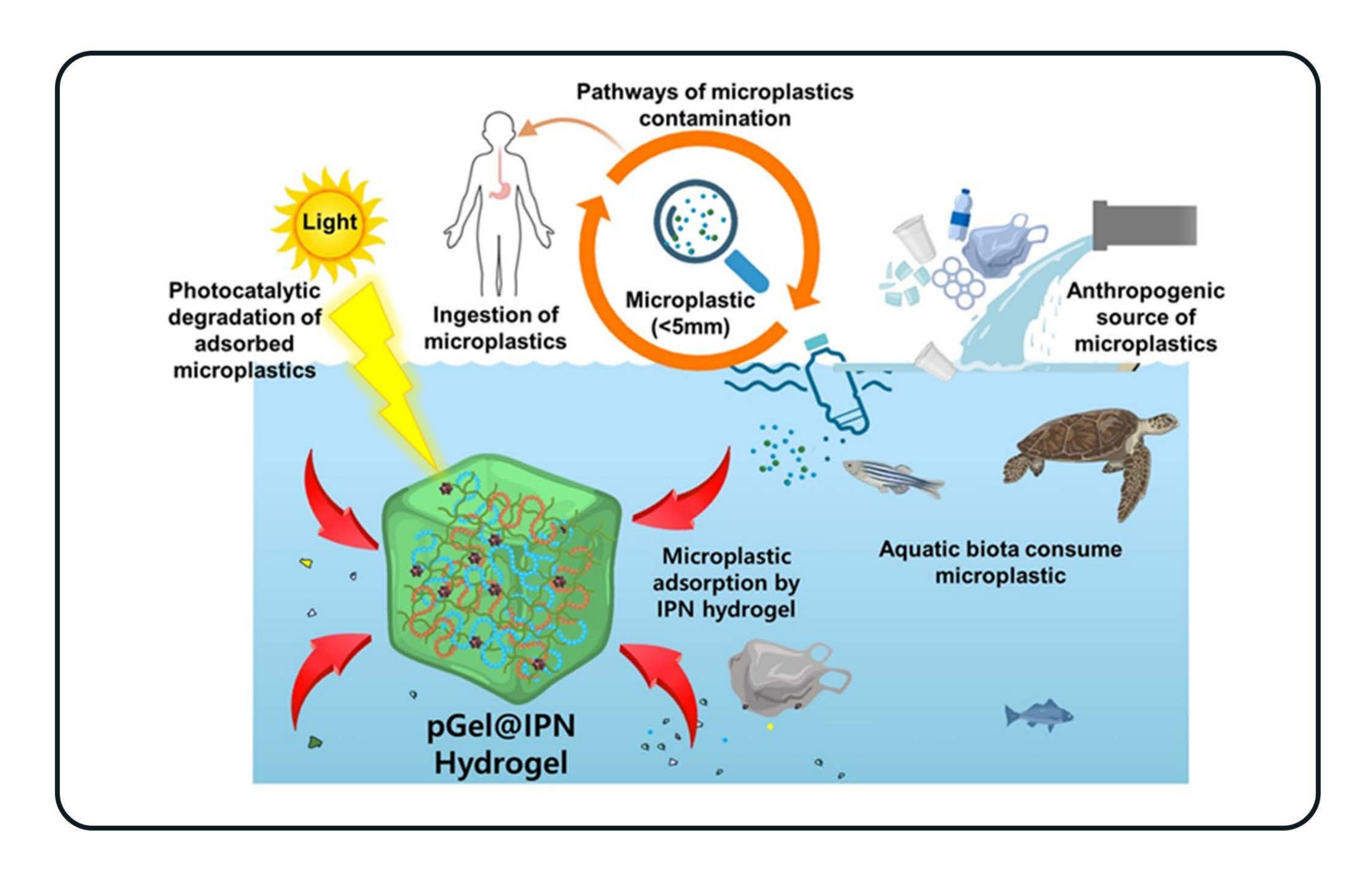
Single-Use Plastics Ban: Implemented from 2022.

Extended Producer Responsibility (EPR): Mandated for plastic under the Plastic Waste Management Rules, 2016.

Un-Plastic Collective: Co-founded by the Confederation of Indian Industry (CII), UNEP, and WWF-India.

Way Forward

- Research and Development: Further research into innovative solutions like hydrogels for effective microplastic degradation.
- Policy Implementation: Strengthen implementation of existing bans and regulations on plastic use and disposal.
- Awareness and Education: Raise awareness among the public about the environmental and health impacts of microplastics and the importance of sustainable practices.



Introduction of Home Voting Facility

Alignment with EC Motto

Aligned with the Election Commission (EC) motto 'No voter is left behind'.

Home Voting Facility

Procedure: Allows voting from home with the presence of a full contingent of polling staff and security personnel while ensuring the secrecy of voting.

Beneficiaries

- Persons with Disabilities (PwDs): Those meeting the 40% benchmark disability criteria.
- Senior Citizens: Aged above 85 years.

Other Inclusive Measures by EC

- Abolishing Form-M: Streamlining the voting process for Kashmiri migrants residing in Jammu and Udhampur.
- SVEEP Initiative: Systematic Voter's Education and Electoral Participation program to engage PwDs and sensitize various stakeholders.
- Proposed Multi-Constituency Remote Electronic Voting Machine (RVM): Enabling migrant voters to vote from their current place of residence.



Postal Ballot

Eligible Voters:

Special voters.

Service voters.

Voters on election duty.

Electors subjected to preventive detention.

Proxy Voting

- Eligibility: Registered electors can delegate their voting rights to a representative they nominate.
- Availability: Primarily for service voters.

Service Voters

Inclusion Criteria:

Members of the armed forces.

Members of police forces serving outside their home state.

Individuals employed under the Government of India in a post outside India.

Members of forces governed by the Army Act, 1950.





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