

# AUGUST 1ST WEEK VITALS COMPILATION

**“The world faces increasing pressure not just to expand renewable energy use, but to improve the technologies behind it, as global energy demand rises and climate goals become more evident the world looks at better green technologies.” Justify the statement (250 Words)**

- » **Climate change and energy insecurity** are major global challenges. While **green technologies like solar, wind, and hydrogen offer promise**, their current limitations **show the need for innovation**.
- » As energy demand grows, it's crucial to expand, improve, and diversify renewable solutions to achieve **a sustainable and resilient future**.



## The Current State of Green Technology

- » **Solar power**, especially **silicon photovoltaics developed** in the 1950s, remains the most widely adopted renewable energy source due to its **scalability and affordability**.
- » **Green hydrogen is gaining traction** as a critical energy solution for **hard-to-electrify sectors like steel, aviation, and shipping**.
- » Despite these developments, **global carbon dioxide levels have surged from 350 ppm in 1990 to over 425 ppm in 2025**.
- » This rise highlights the **shortfall in the current pace of green technology deployment**, indicating that **existing solutions alone are insufficient to meet global net-zero targets**.



## Limitations of Present Green Technologies

**1. Solar Power Efficiency:** Silicon photovoltaic (PV) panels operate at just 15–18% efficiency, requiring large land areas—posing issues in urban or ecologically sensitive zones.

**2. Green Hydrogen Limitations:** Producing hydrogen through electrolysis consumes more energy than it generates. Its low density complicates storage and transport, and its sustainability hinges on the efficiency of the renewable electricity used.

**3. Infrastructure & Geopolitical Risks:** Heavy energy import reliance (like India's ~85%) and concentration of green tech manufacturing (e.g., China's dominance in solar production) expose countries to supply chain and investment risks.



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## Challenges in Transitioning to Better Technologies

- » Many next-gen technologies remain in laboratories **due to lack of long-term investment and policy support.**
- » New technologies often face the “**valley of death**” between **innovation and mass adoption due to high initial costs.**
- » Governments and institutions are often **slow to adapt to or incentivise new technologies.**
- » Consumers, businesses, and even policymakers are often attached to **familiar technologies and hesitant to change.**



## India's Opportunity and Responsibility

- » India, being one of the world's largest energy Consumers and importers, has a unique opportunity to lead in green technology innovation. With initiatives like the **National Green Hydrogen Mission, PM-KUSUM, and PLI schemes for solar manufacturing,** the groundwork is being done



## Conclusion

- » Merely deploying existing green technologies will not be enough; **it requires transformative innovation.**
- » It can be achieved by **embracing diversity in energy solutions** and **pushing the boundaries of science and engineering,** we can build a **sustainable, self-reliant, and equitable energy future.**

**The increasing use of trade protectionist measures by USA by imposing 25% tariff on India poses significant economic and strategic challenges for India. Discuss the impact of such policies suggest a comprehensive policy fir India (250 Words)**

- » **USA announced a 25% tariff** on Indian imports, **citing India's high tariff barriers and deepening ties with Russia** as India's military and energy purchases is on high.
- » This development **threatens to disrupt India-U.S. trade relations** and poses serious **implications for the Indian economy.**
- » USA labelled both Indian and Russian economies as “**Dead Economies**” & **unsustainable,** hinting at political motivations behind the economic policy.





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## Economic Consequences for India

- » **Export Dependency:** The U.S. constitutes nearly 20% of India's total exports. In contrast, India only accounts for around 3% of U.S. imports making exports tougher.
- » **Loss of Comparative Advantage:** A 25% tariff effectively nullifies India's edge in labour-intensive sectors like textiles, pharmaceuticals, and jewellery, where margins are tight.
- » **Impact on GDP:** If half of U.S. orders are lost, India could see a fall in exports, reducing GDP in near future.
- » **PLI Scheme Undermined:** The move particularly threatens India's growing electronics exports, including smartphones, and other technologies
- » **Currency and Inflation:** The rupee has depreciated, raising import costs and inflation, while foreign currency earnings face pressure.



## Risks of Trade Diversion

- » **American importers may shift to alternative suppliers like Vietnam or Indonesia.** This trade diversion **can crowd out Indian goods, especially in sensitive sectors** like seafood, garments, and consumer electronics.

## Strategic Responses for India

- » **Market Diversification:** Expediting trade deals with the EU, Gulf, and emerging markets can reduce overdependence on the U.S.
- » **Boosting Competitiveness:** Indian industries must focus on lowering production costs to stay viable internationally.
- » **Sectoral Support:** Immediate fiscal relief—such as tax rebates, soft loans, or subsidies—should be extended to affected exporters.
- » **Legal Measures:** India can seek redress through the **World Trade Organization (WTO)**.
- » **Diplomatic Engagement:** Constructive negotiation over confrontation is vital for a sustainable solution.



## Conclusion

- » **US tariff move** may be rooted in **protectionist concerns**, its economic **ripple effects are sharpest for India**.
- » **Proactive diplomacy, legal action, and domestic economic reforms** will be key to mitigating the fallout and **safeguarding India's global trade posture**.



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Discuss how India is preparing against the risks of rising Glacial Lake Outburst Floods (GLOFs). Also explain the role of NDMA in mitigating the risks. (250 Words)

- » Glacial Lake Outburst Floods (GLOFs) are **sudden, high-magnitude floods** that occur when the **dam containing a glacial lake fails**.
- » With **climate change accelerating glacial retreat** in the Himalayas, **GLOFs pose a growing threat to lives, infrastructure, and ecosystems in India and its neighbouring countries**.
- » Recognizing the gravity of this hazard, **India has been ramping up its preparedness and mitigation strategies**

## India's Preparatory Measures Against GLOFs

India is actively working to address GLOF risks through a multi-pronged approach:

- » **Early Warning Systems (EWS):** The Indian Space Research Organisation (ISRO) and the Indian Meteorological Department (IMD) are deploying remote sensing technologies to monitor glacial lakes in real-time. Pilot EWS have been installed in Uttarakhand and Sikkim.
- » **Glacial Lake Inventory and Monitoring:** Scientific institutions like the Wadia Institute of Himalayan Geology and NRSC have mapped more than 5,000 glacial lakes across the Indian Himalayas using satellite imagery, identifying potentially dangerous ones.
- » **Structural Mitigation:** Engineering solutions, such as controlled lake draining and construction of outlet channels, are being explored. One such example includes the controlled breaching of South Lhonak Lake in Sikkim.

## Types of Glacial Lakes in the Indian Himalayas

Two most prominent types of glacial lakes found in the Indian Himalayan Region (IHR) are:

- » **Moraine-Dammed Lakes:** Formed behind glacial debris (moraine), these are the most common and most prone to outburst.
- » **Ice-Dammed Lakes:** Formed when meltwater accumulates behind a glacier or ice block, these are less frequent but equally hazardous.



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## NDMA's Role in GLOF Risk Mitigation

The **National Disaster Management Authority (NDMA)** has taken proactive steps:

- » **Guidelines (2020):** Issued a national framework for managing GLOF risks, including zoning, vulnerability assessments, and response planning.
- » **Capacity Building:** NDMA conducts training and simulation exercises for state disaster response forces in Himalayan states.
- » **Community Awareness:** Local communities are being sensitized through education and disaster preparedness programs.



## Conclusion

- » As climate risks intensify, **GLOFs threaten to become more frequent and destructive.**
- » India's strategic focus on **technology, monitoring, structural solutions, and community resilience**, led by institutions like **NDMA**, reflects a **growing commitment** to mountain hazard management.
- » However, **sustained funding, international collaboration, and local engagement remain crucial for long-term safety** in the fragile Himalayan ecosystem.

**What is Digital Sovereignty. How will India -UK FTA have profound consequences in the digital sector. Explain (250 Words)**

- » In the 21st century, **digital sovereignty**—the ability of a state to control and govern its **digital infrastructure, data, and technology**—has emerged as a cornerstone of national security, economic autonomy, and democratic integrity.
- » For India, with its fast-growing **digital economy and ambitions of becoming a global tech hub, safeguarding digital sovereignty is non-negotiable.** However, recent developments, especially commitments made under the **India-U.K. Free Trade Agreement (FTA)**, raise serious concerns.





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## What Is at Stake?

Digital sovereignty encompasses control over:

- » **Data localization and protection**
- » **Regulation of digital platforms and content**
- » **Access to source codes and algorithms**
- Cybersecurity policies and digital taxation**

Free trade agreements often **push for liberalization** in these areas, **favouring multinational corporations over national regulatory frameworks**. The India-U.K. FTA is no exception.

## Compromises in the India-U.K. FTA

Though details of the agreement **remain partly confidential, leaks and expert analysis** suggest India has made several **key compromises**:

- » **Restrictions on Data Localization:** India has reportedly agreed to limit mandatory data localization requirements, which could allow foreign companies to store Indian users' data abroad—undermining the country's jurisdiction over critical personal and financial information.
- » **Source Code Disclosure Waivers:** India may have agreed not to demand source codes or algorithms from foreign digital firms, which restricts its ability to audit or regulate platforms on issues like bias, surveillance, and misinformation.
- » **Dilution of Digital Taxation Rights:** Provisions against imposing digital services taxes on foreign firms may restrict India's fiscal autonomy in the future.

## Implications for Digital Sovereignty

These concessions could have **long-term ramifications**:

- » **Weakened regulatory control** over foreign Big Tech firms operating in India
- » **Vulnerability to data breaches and surveillance**, impacting national security
- » **Loss of leverage** in future multilateral digital trade negotiations
- » **Reduced incentives** to build domestic data infrastructure and cloud services



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## Balancing Trade and Sovereignty

While FTAs bring economic benefits, India must strike a **careful balance** between market access and sovereign control. Upholding digital sovereignty does not mean isolation but ensuring **strategic autonomy** in setting the rules that govern its cyberspace.



## Conclusion

- » India's digital future **must not be negotiated** away in the fine print of trade deals.
- » As the digital economy becomes **central to national development and security**, **protecting digital sovereignty is not just a policy choice—it is a national necessity.**

**India's economic and technological progress is closely linked to its geopolitical strategy. Analyze the challenges and opportunities, measures India faces in reshaping its geopolitical approach . (250 Words)**

- » A unified global order are fading, giving way to multipolarity, regional strife, and weakened international institutions. The unsettled geopolitical climate presents both challenges and openings for India.
- » With a dynamic economy, youthful population, and high-tech ambitions, India must respond with smart, balanced diplomacy to establish a stable foundation for future growth in economic and technological fields.



## The Shattered Geopolitical Order: A New Global Reality

### **Major Geopolitical Rivalries:**

- » **US-China** competition reshapes global alliances
- » **Russia's military assertiveness** (e.g., Ukraine war) adds polarization

### **Weakening of Global Institutions:**

- » **UN, WTO**, and **WHO** criticized for lack of effectiveness
- » Regional blocs like **EU** and **ASEAN** face internal challenges

### **Rise of National Interests:**

- » Countries prioritize sovereignty over global rules
- » **Economic** and **tech interdependencies** are now used as strategic leverage



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## India's Economic and Technological Aspirations

- » India aims to become a **\$5 trillion economy**, a **global electronics manufacturing hub**, and a leader in **digital innovation, space, and defense technology**.
- » **Key government initiatives like Make in India, Digital India, Atmanirbhar Bharat, Semiconductor Mission, Startup India, and Gati Shakti** boost domestic capabilities and global competitiveness.



## Why Geopolitics Matters for Economic and Technological Growth

- » **Technology Transfer & Strategic Partnerships: Defense, AI, and space sectors** need international cooperation with countries like the **US, France, and Japan**.
- » **Supply Chain Resilience:** India's stability attracts companies relocating from China amid global supply chain vulnerabilities.
- » **Access to Capital and Markets:** Geopolitics shapes **FDI** and trade agreements with the **EU, UK, and Canada**.
- » **Energy Security:** Stable ties with **Russia, the US, and Gulf nations** are crucial for energy imports.
- » **Climate Diplomacy and Green Tech:** India's leadership in green energy depends on global support for funding and technology.



## Strategic Autonomy and India's Global Role

India's foreign policy centers on strategic autonomy—engaging multiple powers without strict alliances. This allows India to balance relations, such as participating in **QUAD** while maintaining ties with **Russia**, and being part of **BRICS** while countering **China's** moves. This approach helps India access diverse partnerships and investments

India is also actively reshaping the global order through leadership roles like the **2023 G20 Presidency**, advocating for the **Global South**, and showcasing soft power via initiatives like **Vaccine Maitri**. These efforts boost **India's diplomatic influence**, supporting its economic and technological goals.



## Conclusion

- » Geopolitics is no longer just a foreign policy concern—it is a critical pillar of national development.
- » A stable, strategically autonomous, and globally engaged India can not only secure its own future but also contribute meaningfully to a more equitable world order

