

Editorial of the Day – 20.03.2026

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1. Losing the way- On ISRO and issues with its NavIC constellation (TH)

General Studies Paper- GS III (Science and Technology)

Topic- Achievements of Indians in science & technology; indigenization of technology and developing new technology.

Sub-Topic- Space Technology, IRNSS/NavIC, Satellite Navigation Systems, and Strategic Autonomy.

1. Introduction

In March 2026, India's indigenous regional navigation system, NavIC, entered a state of operational crisis. Despite a decade of launches starting in 2013, the constellation has seen a rapid decline in its functional capacity. With the recent failure of the atomic clock on IRNSS-1F, the system has fallen below the minimum threshold required to provide reliable Position, Navigation, and Timing (PNT) services. This decline highlights a growing gap between India's space ambitions and its execution capabilities.

2. The Operational Crisis- Falling Below the Threshold

For a satellite navigation system to work, "the power of four" is the absolute minimum requirement.

1. **Minimum Functional Requirement-** At least four operational satellites are needed to calculate a 3D position (latitude, longitude, altitude, and time).
2. **Current Status (2026)-** Only three satellites remain fully functional for PNT services. This makes the entire constellation technically ineffective for real-time user applications.
3. **Constellation Attrition-** Since 2013, 11 satellites have been launched, but the combined impact of decommissioning, orbital failures, and clock malfunctions has hollowed out the system.

3. Technical Failures- The Atomic Clock Crisis

The "heart" of a navigation satellite is its atomic clock; if the clock fails, the satellite is essentially "blind."

1. **Rubidium Clock Failures-** First-generation satellites utilized rubidium atomic clocks from *SpectraTime* (Europe), which have shown a recurring pattern of failure.
2. **The IRNSS-1F Setback-** On March 13, 2026, the clock onboard IRNSS-1F failed. Although the satellite had completed its design life, its failure was the "tipping point" that broke the minimum constellation requirement.
3. **Launch Setbacks-** The transition to the second-generation was hampered by the NVS-02 launch failure (2025), which failed to reach its intended orbit, further delaying the replenishment cycle.

4. Institutional and Structural Bottlenecks

The crisis is not just technical; it is deeply rooted in how India manages its space assets.

1. **The "Dual-Role" Burden-** ISRO currently handles both the design/R&D and the day-to-day operations of the navigation system. This overburdens the agency and dilutes its focus.
2. **Lack of Dedicated Agency-** Unlike the U.S. (GPS Directorate) or the EU (EUSPA), India lacks a dedicated civilian authority to manage navigation services, user adoption, and international coordination.

3. **Policy Gaps**– The absence of a comprehensive National Space Law creates uncertainty in governance, private sector integration, and long-term funding commitments.
4. **Strategic Origins**– NavIC was born from the denial of GPS during the Kargil War (1999). Its heavy defense focus has arguably slowed down its mass-market civilian adoption compared to systems like China's *BeiDou*.

5. Recovery Roadmap and Constraints

ISRO is attempting to steer the system back to health, but the path is cluttered with obstacles.

1. **Indigenous Advancement**– Since 2018, ISRO has shifted to indigenous atomic clocks, successfully deployed in NVS-01 (2023).
2. **Redundancy Plan**– New satellites are planned to carry five clocks each (up from three) to increase reliability and system lifespan.
3. **Feasibility Concerns**– Low Launch Frequency– Current PSLV launch rates are insufficient to replace aging satellites faster than they fail.
 1. **Budgetary Pressure**– Competing priorities (Gaganyaan, Chandrayaan missions) put a strain on the capital available for routine navigation maintenance.
 2. **Confidence Gap**– Repeated technical glitches have reduced commercial confidence in NavIC for integration into smartphones and logistics.

Conclusion

The current distress of NavIC is a sobering reminder that strategic autonomy requires more than just successful initial launches—it requires sustained infrastructure management. While the shift to indigenous clocks and the planned 2026 launches offer a path forward, they must be accompanied by institutional reforms. Establishing a dedicated navigation authority and passing a Space Act are no longer optional; they are essential for ensuring that India's "wayfinder" doesn't lose its own way.

Source– <https://www.thehindu.com/opinion/editorial/losing-the-way-on-isro-and-issues-with-its-navic-constellation/article70758366.ece>

QUESTION

"The current operational crisis of the NavIC constellation highlights that technological 'indigenization' alone is insufficient without a robust institutional framework and a sustained replenishment cycle. Critically analyze the factors behind the declining efficiency of NavIC and suggest measures to secure India's navigation sovereignty." (250 Words, 15 Marks)

1. Introduction

NavIC (Navigation with Indian Constellation), established to ensure independent regional navigation, is currently facing its most severe operational crisis. As of March 2026, the constellation has fallen below the minimum threshold of four functional satellites required for accurate 3D Position, Navigation, and Timing (PNT) services. This decline from its original 7-satellite design reflects a mismatch between ambitious strategic goals and the practicalities of space-asset management.

2. Factors Behind Declining Efficiency

1. **Technical Attrition (The Atomic Clock Crisis)**– The primary failure point has been the rubidium atomic clocks. While early satellites used imported clocks that suffered repeated malfunctions, even the transition to indigenous clocks has been slowed by the aging of the initial constellation. The failure of IRNSS-1F in March 2026 was the tipping point that broke the functional minimum.
2. **Replacement and Launch Lag**– The "replenishment cycle" has not kept pace with satellite mortality. The failure of the NVS-02 mission in 2025 further delayed the deployment of second-generation satellites, creating a gap in service continuity.
3. **ISRO's Dual-Role Burden**– Unlike global peers (GPS or Galileo), India lacks a dedicated agency for navigation. ISRO currently manages both research and development (R&D) and daily operations.

This dual burden dilutes focus and delays the transition from a "defense-only" system to a "mass-market" civilian utility.

4. **Lack of Legislative Framework-** The absence of a comprehensive National Space Law hinders private sector participation and long-term budgetary predictability, leaving NavIC dependent on ad-hoc mission allocations.

3. Strategic and Economic Implications

1. **Strategic Vulnerability-** A non-functional NavIC forces India to rely back on foreign GNSS (like GPS or BeiDou), posing a risk during regional conflicts—the very scenario NavIC was designed to mitigate after the 1999 Kargil War.
2. **Economic Stagnation-** The lack of a stable signal reduces commercial confidence, hindering the integration of NavIC into the domestic logistics, drone, and smartphone industries.

4. Measures to Secure Navigation Sovereignty

1. **Establishment of a Dedicated Authority-** India should create a National Navigation Agency (on the lines of EUSPA) to handle operations, user-segment development, and international standard-setting, leaving ISRO to focus on core R&D.
2. **Accelerated Replenishment-** Increasing the launch frequency of GSLV/PSLV missions to deploy the remaining NVS-series satellites is non-negotiable to restore the 7-satellite baseline.
3. **Redundancy and Reliability-** New satellites should move toward a 5-clock redundancy (currently planned) and prioritize the L1 frequency band to ensure immediate compatibility with consumer electronics.
4. **Legislative Action-** Expediting the Space Act to provide a clear legal framework for satellite-based services and liability management.

5. Conclusion

NavIC is a cornerstone of India's Atmanirbhar Bharat in space. However, its current "distress" signals that technical success is not a one-time event but a continuous process of replenishment and institutional evolution. Restoring NavIC's operational health is essential to ensure that India's strategic "eyes in the sky" do not lose their way in an increasingly contested geopolitical landscape.

Source- <https://www.thehindu.com/opinion/editorial/losing-the-way-on-isro-and-issues-with-its-navic-constellation/article70758366.ece>

2. Why Supreme Court struck down the 3-month cap on maternity leave for adoptive mothers (IE)

General Studies Paper II- Governance, Constitution, Polity, and Social Justice.

Topic- Welfare schemes for vulnerable sections; Mechanisms, laws, institutions, and bodies constituted for the protection and betterment of vulnerable sections (Women and Children).

Sub-Topic- Fundamental Rights (Article 14, 21), Directive Principles (Article 42), Judiciary, and Gender Justice.

1. Introduction

In March 2026, the Supreme Court of India struck down a restrictive provision that denied maternity leave to mothers adopting children older than three months. The Court declared this age limit arbitrary and unconstitutional, citing a violation of the Right to Equality (Article 14). This judgment mandates that all adoptive mothers are entitled to 12 weeks of maternity leave from the date of adoption, regardless of the child's age.

2. Legal Framework- Maternity Benefits in India

India's legal landscape for maternity protection is built on welfare principles aimed at protecting women's employment and health-

1. **Maternity Benefit Act, 1961**- The foundational law providing paid leave to women workers, reflecting the state's commitment to humane working conditions.
2. **Code on Social Security, 2020**- While this code expanded coverage to adoptive and commissioning (surrogacy) mothers, it retained a three-month age cap for the child, which effectively barred many from accessing benefits.
3. **Directive Principles (Article 42)**- The Constitution mandates the State to make provisions for securing just and humane conditions of work and for maternity relief.

3. The SC Judgment- Constitutional Pillars

The Court's reasoning was anchored in several key constitutional doctrines-

1. **Article 14 (Equality)**- The Court ruled that the age-based classification lacked a "rational nexus." Since all adoptive mothers perform identical caregiving and bonding roles, there was no logical reason to discriminate based on the child's age.
2. **Article 21 (Life and Dignity)**- The judgment linked maternity leave to reproductive autonomy and the right to live with dignity, recognizing that motherhood is as much a social and emotional state as a biological one.
3. **Substantive Equality**- The Court moved beyond "formal equality" (treating everyone the same) to "substantive equality"-recognizing the specific hurdles adoptive mothers face and correcting them.
4. **Judicial Activism**- This ruling exemplifies the judiciary's role as a corrective force for legislative gaps in social justice.

4. Adoption Realities vs. Restrictive Caps

The Court noted that the three-month limit was practically impossible to meet due to the following-

1. **Juvenile Justice (JJ) Act, 2015**- Legal adoption is a rigorous process involving declaring a child "legally free" for adoption.
2. **Procedural Delays**- Biological parents are given a mandatory two-month reconsideration period, and tracing biological families takes time.
3. **Ineffectiveness of the Cap**- By the time the legalities are finalized, the vast majority of children are older than three months, rendering the previous law's "benefit" a nullity.
4. **Institutional Care Needs**- Children coming from institutional care often face higher stress and developmental needs, requiring more, not less, intensive bonding time with their new mothers.

5. Redefining Motherhood- Beyond Biology

The judgment pushed the boundaries of how the state perceives the family unit-

1. **Expanded Definition**- Maternity is now legally defined by the role of caregiving and bonding, not just the biological act of childbirth.
2. **Child Development**- The Court emphasized that early bonding is critical for a child's cognitive and emotional security, regardless of how they entered the family.
3. **The Wollstonecraft Dilemma**- The ruling addressed the persistent conflict women face between their caregiving roles and their participation in the workforce, seeking to alleviate the "double burden."

6. The Road to Social Security Reform

The judgment serves as a catalyst for broader discussions on parental rights in India-

Issue	Current Status	Proposed Reform / Goal
Paternity Leave	Lacks comprehensive national policy.	Recognize parenting as a joint responsibility.
Gender-Neutral Leave	Focus is almost exclusively on women.	Adopt global models (e.g., Sweden/Norway) for parental leave.

Workplace Barriers	Women face career setbacks due to caregiving.	Implement workplace flexibility and supportive infrastructure.
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7. Conclusion

The Supreme Court's intervention is a milestone for gender justice and inclusive social security. By removing the arbitrary age cap, the Court has reinforced that the dignity of a mother and the welfare of a child cannot be limited by biological timelines. It signals a shift toward a more empathetic and equitable legal system where family structures are recognized in all their diversity.

Source- <https://indianexpress.com/article/explained/explained-law/sc-maternity-leave-adoptive-mothers-3-month-rule-struck-down-10589099/>

3. Energy security and renewable energy (THE PIONEER)

General Studies Paper III – Environment & Economy

Topic- Energy security and renewable energy

Sub-Topic- Climate change mitigation and adaptation

Introduction

India is undergoing a major transformation in its energy sector, aiming to balance economic growth, energy security, and climate commitments. With ambitious targets in renewable energy and electric mobility, the country is transitioning from fossil fuels towards a sustainable and decarbonised energy system.

1. India's Energy Transition Pathway

1. India has significantly expanded its renewable energy capacity, especially solar and wind.
2. The transition is aligned with Nationally Determined Contributions (NDCs) and climate goals.
3. Focus is on reducing dependence on fossil fuel imports and improving energy efficiency.

2. Key Pillars of Energy Transition

Renewable Energy Expansion–Large-scale deployment of solar parks, wind energy, and hybrid systems.

Electric Mobility–Promotion of electric vehicles (EVs) to reduce oil consumption and emissions.

Green Hydrogen–Development of green hydrogen ecosystem for industrial decarbonisation.

Energy Efficiency–Improving efficiency across sectors to reduce overall energy demand.

3. Policy and Institutional Support

Government Schemes–Initiatives such as PLI schemes, solar missions, and EV incentives.

Distribution Sector Reforms–Strengthening power distribution through financial and operational reforms.

Infrastructure Development–Investment in grid expansion, storage systems, and transmission networks.

4. Socio-Economic Benefits

Energy Security–Reduced dependence on imports enhances strategic autonomy.

Economic Growth–Renewable energy sector creates jobs and investment opportunities.

Environmental Sustainability–Lower emissions contribute to climate change mitigation.

Inclusive Development–Expanding access to clean energy improves quality of life and rural development.

5. Challenges in Energy Transition

Grid Integration–Managing variability of renewable energy requires advanced grid systems and storage.

Financial Constraints–High initial investment costs for infrastructure and technology.



Dependence on Imports–Reliance on imported components for solar panels and batteries.

Policy and Regulatory Issues–Need for consistent policies and coordination across states.

6. Way Forward

Strengthening Grid Infrastructure–Invest in smart grids and energy storage technologies.

Domestic Manufacturing–Promote local production of renewable energy components.

Policy Stability–Ensure long-term policy consistency to attract investment.

International Cooperation–Collaborate globally for technology transfer and climate finance.

Conclusion

India's energy transition represents a critical step towards sustainable development and climate resilience. By strengthening infrastructure, promoting innovation, and ensuring policy coherence, India can achieve a secure, affordable, and clean energy future.

Source- <https://dailypioneer.com/news/towards-sustainable-energy-transition>

UPSC Mains Practice Question

Q. India's energy transition is essential for achieving sustainable development and climate goals.

Discuss the key challenges in this transition and suggest measures to ensure a balanced and effective energy transition. (250 words)

Introduction

India's energy transition aims to reduce dependence on fossil fuels while promoting renewable energy and sustainability. This transition is essential for addressing climate change and ensuring long-term energy security.

Challenges

1. Grid Integration Issues–Renewable energy variability creates challenges in power management.

2. Financial Constraints–High costs of infrastructure and technology.

3. Import Dependence–Reliance on imported components for renewable energy systems.

Measures

1. Strengthening Infrastructure–Invest in smart grids and storage systems.

2. Promoting Domestic Manufacturing–Encourage local production of renewable technologies.

3. Policy Stability–Ensure consistent and long-term policy support.

Conclusion

A balanced approach combining infrastructure development, domestic capacity building, and policy support is essential for a successful energy transition. This will help India achieve sustainable growth and energy security.

Source- <https://dailypioneer.com/news/towards-sustainable-energy-transition>

4. Merge state oil firms to absorb price shocks (THE PIONEER)

General Studies Paper III – Economy

Topic– Energy economics and pricing

Sub-Topic– Public sector enterprises and reforms

Introduction

Volatility in global crude oil prices has significant implications for India's economy, affecting inflation, fiscal stability, and energy security. Public Sector Oil Marketing Companies (OMCs) play a key role in cushioning such shocks. The idea of merging state-owned oil firms and reforming subsidy mechanisms aims to improve efficiency and better absorb price fluctuations.

1. Structure of India's Oil Sector

1. India's oil sector includes major public sector companies engaged in exploration, refining, and marketing.
2. Key entities operate across different segments, often functioning independently.
3. This fragmented structure limits coordinated response to global price shocks.

2. Rationale for Merging Oil Companies

Economies of Scale—Mergers can create larger entities capable of better financial resilience.

Integrated Operations—Combining upstream and downstream activities improves operational efficiency.

Better Risk Management—Integrated firms can balance losses in one segment with gains in another.

Global Competitiveness—Larger firms can compete more effectively with international oil majors.

3. Price Shock Absorption Mechanism

1. Oil price fluctuations directly affect fuel prices and inflation.
2. Stronger, integrated firms can absorb short-term shocks without passing full costs to consumers.
3. This helps maintain price stability and economic balance.

4. Issues with Current Subsidy Framework

Inefficient Targeting—Subsidies such as LPG support are often not well-targeted, leading to leakages.

Fiscal Burden—High subsidy expenditure strains government finances.

Market Distortions—Subsidies can distort pricing signals and consumption patterns.

5. Proposed Reforms

Targeted Subsidy Delivery—Link subsidies to income criteria and direct benefit transfer mechanisms.

Gradual Subsidy Rationalisation—Phase out universal subsidies while protecting vulnerable sections.

Pricing Reforms—Allow fuel prices to reflect market conditions with limited intervention.

6. Challenges in Implementation

Market Competition Concerns—Mergers may reduce competition and create monopolistic tendencies.

Operational Integration Issues—Aligning different organisational structures can be complex.

Political Sensitivity—Fuel pricing and subsidy reforms have significant socio-political implications.

Conclusion

Merging public sector oil companies and rationalising subsidies can enhance India's ability to manage global oil price volatility. However, reforms must balance efficiency, competition, and social welfare to ensure sustainable and equitable outcomes.

Source- <https://dailypioneer.com/news/merge-state-oil-firms-to-absorb-price-shocks>

UPSC Mains Practice Question

Q. Discuss the role of public sector oil companies in managing fuel price volatility in India. Evaluate the proposal to merge such companies and rationalise subsidies. (250 words)

Introduction

Global crude oil price volatility significantly impacts India's economy. Public sector oil companies play a crucial role in stabilising fuel prices and ensuring energy security.

Role of Oil Companies

1. Price Stabilisation—Absorb fluctuations to prevent sharp increases in fuel prices.

2. Supply Security—Ensure continuous availability of petroleum products.

3. Fiscal Support—Help manage subsidy burdens through operational adjustments.

Evaluation of Merger Proposal

Advantages

1. Economies of scale and improved efficiency.
2. Better ability to absorb price shocks.

Concerns–Reduced competition and operational complexities.

Conclusion

Merging oil companies and reforming subsidies can improve efficiency and resilience. However, careful implementation is necessary to balance market efficiency with consumer welfare.

Source- <https://dailypioneer.com/news/merge-state-oil-firms-to-absorb-price-shocks>



