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Ganga Expressway: Regional Connectivity in Uttar Pradesh

The recently inaugurated Ganga Expressway marks a major milestone in India's push for infrastructure-led growth, emerging as a vital corridor that links the agrarian heartlands of eastern Uttar Pradesh with the more industrialised western regions. By significantly improving connectivity, reducing travel time, and enabling smoother movement of goods and people, the project is expected to unlock new opportunities in agriculture, industry, and regional trade. Developed under a Public-Private Partnership (PPP) model, it also showcases the growing role of private participation in large-scale infrastructure creation. At the same time, the project brings into focus important questions around sustainability, land use, and inclusive development, making it a compelling case study in balancing economic ambition with environmental and social considerations.

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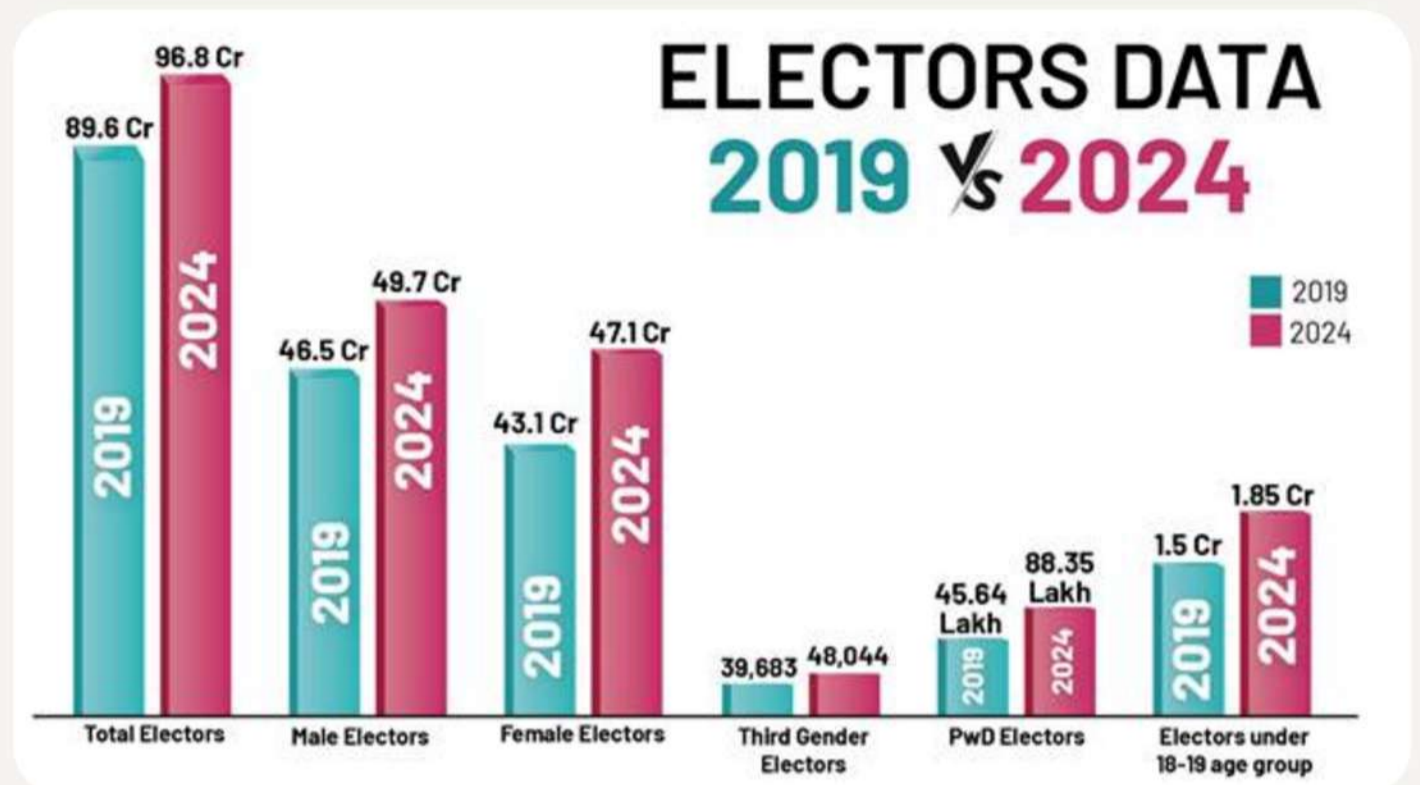


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Sun-Organon deal, mitigating future market risk

Electoral participation has been on a steady rise in India

India has witnessed a sustained rise in voter turnout across States over the past decade, indicating a deepening of electoral participation rather than a sudden surge. Data from multiple election cycles show that this increase is broad-based and not limited to specific regions or political contexts.



Understanding Voter Turnout and SIR

Voter turnout refers to the percentage of eligible voters who cast their vote in an election. The **Special Intensive Revision (SIR)** is an administrative exercise to update electoral rolls and ensure accuracy. While SIR may marginally raise turnout percentages by refining the voter base, it acts as a supplementary factor rather than the primary driver of increased participation.

State-wise Trends and Data Evidence

Several States show clear upward trends:

- Gujarat (59.77% → 64.84%), Uttar Pradesh (45.96% → 61.08%)
- Goa (70.51% → 81.89%), Manipur (86.73% → 90.28%)

Similarly, Karnataka, Madhya Pradesh, Rajasthan, and Chhattisgarh have recorded consistent increases. Even historically high-turnout States such as Kerala, Tamil Nadu, and West Bengal have further improved participation levels, indicating that gains are not limited to low-turnout regions.

Exceptions and Regional Variations

The upward trend is not uniform. States like Punjab and Haryana have witnessed declining turnout, while some northeastern States show stagnation. These variations highlight the role of local political dynamics, administrative efficiency, and voter engagement levels, suggesting that turnout growth is context-specific rather than automatic.

Long-term Structural Trend vs Recent Factors

The data suggests that rising turnout is part of a long-term structural trend driven by:

- Increased political awareness and mobilisation
- Improved electoral management and outreach
- Greater perceived significance of elections

Recent interventions like SIR may have amplified turnout figures, but the underlying momentum predates such measures.

Key Issues and Emerging Dimensions

- **Strengthened democratic legitimacy:** Higher participation enhances representativeness of electoral outcomes
- **Improved political accountability:** Greater voter engagement pressures parties to respond to public demands
- **Administrative challenges:** Rising turnout necessitates better electoral infrastructure and management
- **Policy relevance:** Understanding regional disparities is crucial for targeted electoral reforms

Overall, the steady rise in voter turnout reflects a maturing Indian democracy with expanding citizen engagement. While variations persist across States, the broader trend underscores the need to sustain this momentum through inclusive electoral practices, improved infrastructure, and continued voter awareness initiatives.

Ganga Expressway: Regional Connectivity in Uttar Pradesh

PM Narendra Modi inaugurated the Ganga Expressway on 29 April 2026, one of India's longest greenfield expressway projects. Developed by Uttar Pradesh Expressways Industrial Development Authority, the 594 km, six-lane (expandable to eight) corridor connects Meerut to Prayagraj, reducing travel time from 10–12 hours to about 6–8 hours. This project has successfully created a high-speed east–west corridor across the state of UP, connecting agrarian and industrial corridors

Key Features and Infrastructure Components

The expressway is designed for speeds up to 120 km/h and includes extensive infrastructure:

- 14 major bridges, including over the Ganga River and Ramganga
- 7 railway overbridges, 32 flyovers, 185 minor bridges
- 453 underpasses and 795 culverts ensuring seamless flow
- 21 interchanges and multiple toll plazas for connectivity
- Additionally, a 3.5 km emergency airstrip in Shahjahanpur enhances strategic and disaster-response capabilities.

PPP Model and Financing Structure

The project is implemented under the **Design-Build-Finance-Operate-Transfer (DBFOT)** model, a form of Public-Private Partnership (PPP):

- Private players finance and operate the project, recovering costs via tolls over 27 years
- The State ensures viability through mechanisms like revenue compensation during rebate periods
- This reflects the growing role of PPPs in mobilising private capital, reducing fiscal burden, and improving efficiency

The Ganga Expressway exemplifies India's push towards infrastructure-led growth through PPP models, balancing economic expansion with connectivity. Going forward, the focus must be on environmental sustainability and equitable regional benefits to ensure that such mega projects translate into inclusive and sustainable development outcomes.



Economic Significance and Growth Linkages

The expressway is expected to:

- Reduce logistics costs and transit time across Uttar Pradesh and improve movement of goods between western UP's industrial centres and eastern UP's agrarian regions
- Strengthen agro-industrial linkages, especially for crops like sugarcane, wheat, and dairy products, by enabling faster access to markets and processing hubs
- Catalyse industrial and logistics clusters along the corridor, particularly in relatively underdeveloped districts of central and eastern UP, aiding regional economic convergence.
- Enhance religious and cultural tourism, especially connectivity to Prayagraj (Kumbh Mela hub).
- Integrate with existing expressways (Yamuna, Purvanchal, Bundelkhand) to create a broader high-speed network, reinforcing Uttar Pradesh as a logistics backbone of North India.

SCIENCE

First-of-its-kind satellite by Indian start-up flies on SpaceX rocket

An Indian start-up, GalaxEye, has launched its first satellite 'Drishti' aboard a Falcon 9 from the Vandenberg Space Force Base. The satellite introduces a first-of-its-kind imaging system combining optical and radar technologies for simultaneous data capture.



What is Opto-SAR Technology?

Drishti uses Opto-SAR technology, integrating:

- **Optical imaging** – Provides clear, high-resolution, human-readable images.
- **Synthetic Aperture Radar (SAR)** – Enables imaging in all weather conditions, including clouds and night.

This combination overcomes the limitations of using each technology separately, ensuring both clarity and continuity in imaging.

Simultaneous Imaging

Unlike traditional systems that rely on separate satellites, Drishti captures optical and SAR images of the same location at the same time.

- Eliminates the need to manually combine datasets.
- Ensures consistent viewing angles and better accuracy.
- Uses AI to generate optical-like images from SAR data when visibility is poor.

This synchronisation is enabled by a proprietary technology stack developed by GalaxEye.

Problem Addressed

Conventional satellite imaging faces key challenges:

- Optical images fail in cloudy or night conditions.
- SAR images are complex and less intuitive.
- Data fusion from multiple satellites leads to time and angle mismatches.

The launch of Drishti marks a significant step in space imaging by combining clarity with all-weather reliability. It highlights India's growing capabilities in space technology and underscores the role of start-ups in driving innovation tailored to local and global needs.

Applications and Significance

The satellite has wide-ranging applications:

- **Civilian uses:** Agriculture monitoring, disaster management, urban planning.
- **Strategic uses:** Surveillance and defence intelligence.
- Enhances accessibility of space-based data for diverse users.

India's Emerging Space Start-up Ecosystem

India's space sector is witnessing a structural shift from a government-led model to a public-private partnership ecosystem, with start-ups playing a central role in innovation and commercialisation. This transition has been enabled by policy reforms such as the creation of IN-SPACE and NewSpace India Limited.

Key players illustrate the depth of this ecosystem:

- **Agnikul Cosmos** – Developed the world's first fully 3D-printed semi-cryogenic rocket engine, reducing manufacturing time and cost.
- **Skyroot Aerospace** – Successfully launched private rockets (Vikram series), marking India's entry into commercial launch services.
- **Pixxel** – Building high-resolution hyperspectral imaging satellites for advanced Earth observation.
- **Dhruva Space** – Focuses on satellite platforms and end-to-end space solutions.
- **Bellatrix Aerospace** – Developing green propulsion systems and advanced space mobility solutions.

The Indian EXPRESS

The next fuel shift: More ethanol in the tank

The proposal by the Ministry of Road Transport and Highways to introduce higher ethanol blends such as E85 and E100 marks a significant shift in India's fuel strategy beyond the existing E20 mandate. This move, enabled through amendments to the Central Motor Vehicles Rules, 1989, aims to promote flex-fuel vehicles and reduce dependence on imported crude, especially amid supply disruptions linked to the West Asia conflict and the Strait of Hormuz. Ethanol, currently cheaper than petrol, strengthens the economic case for such a transition. However, challenges remain in terms of vehicle compatibility, infrastructure readiness, and long-term sustainability of feedstocks. Over-reliance on water-intensive crops like rice and sugarcane raises environmental concerns, necessitating a shift towards more sustainable alternatives such as millets. The policy signals an inflection point in India's biofuel strategy, but its success will depend on balancing energy security and agricultural priorities.

Editorial to Exam - Most probable question from this editorial

India's push towards higher ethanol-blended fuels reflects both energy security concerns and environmental considerations. Critically examine the opportunities and challenges associated with the adoption of flex-fuel vehicles and higher ethanol blending in India.



Doctors decide

The recent observations of the Supreme Court of India on abortion laws highlight the tension between reproductive autonomy and medical safety, particularly in cases involving minor rape survivors. While the Court has emphasised a woman's right to choose, even at advanced stages of pregnancy, concerns have been raised regarding the health risks of late-term termination beyond the legally permitted 24 weeks under the Medical Termination of Pregnancy Act. The debate underscores the importance of clinical assessment in determining the safety of such procedures, especially when gestational age significantly increases medical risks. While restricting access may push women towards unsafe alternatives, unregulated autonomy without adequate medical oversight could endanger health and life. The issue thus reflects a complex balance between safeguarding individual rights and ensuring evidence-based medical decision-making within a supportive legal and institutional framework.

Editorial to Exam - Most probable question from this editorial

The debate on abortion laws in India reflects a tension between reproductive autonomy and medical ethics. Critically examine the challenges in balancing women's rights with clinical safety in the context of the Medical Termination of Pregnancy framework.

thehindu **businessline.**

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Costly remedy

The \$11.75 billion acquisition of Organon by Sun Pharmaceutical Industries reflects strategic repositioning amid changing global trade and regulatory dynamics, particularly new U.S. tariff measures following Section 232 investigations. With a significant share of revenue tied to the U.S. generics market, the deal may help Sun Pharma secure market access, diversify geographically (including entry into China), and expand into segments like women's health and biosimilars. However, the acquisition carries financial and operational risks, including Organon's high debt levels, dependence on a limited product portfolio, and declining revenues due to patent expiries. Concerns over regulatory scrutiny, aggressive sales practices, and product safety further highlight potential challenges for both investors and consumers, especially in India. The development underscores the need for strong regulatory oversight to balance innovation, market expansion, and public health safeguards in the pharmaceutical sector.

Editorial to Exam - Most probable question from this editorial

Global pharmaceutical mergers and acquisitions are increasingly shaped by trade policies and regulatory environments. Critically examine the opportunities and risks such deals pose for India's pharmaceutical sector, with reference to market access, public health, and regulatory oversight.

Keeping India's carbon money at home

The **Carbon Border Adjustment Mechanism (CBAM)**, implemented by the European Union from January 1, 2026, imposes a carbon price on imports such as steel, aluminium, and cement.

CBAM intended to ensure fair competition by aligning import costs with domestic carbon pricing, its design creates asymmetries for developing countries like India, regarding trade competitiveness and climate justice.

Why is CBAM disruptive?

CBAM is linked to the EU's domestic carbon pricing under the EU Emissions Trading System, where European producers pay for emissions. However, they continue to receive subsidies and free allowances (to be phased out gradually by 2034), reducing their effective carbon cost. In contrast, Indian exporters face full CBAM charges without comparable state support, raising concerns about fairness and compliance with global trade norms like World Trade Organization principles (e.g., GATT Article III).

India-EU FTA and Limited Flexibility

The recently concluded India-EU Free Trade Agreement (2026) does not exempt India from CBAM. However, Annex 14-A provides a limited opening through:

- A technical dialogue on CBAM implementation
- Recognition of carbon pricing in the country of origin
- A most-favoured-nation clause ensuring parity with other countries

This creates a narrow but important pathway for India to negotiate credit for its domestic carbon pricing mechanisms.

India should leverage CBAM provisions and FTA mechanisms to ensure recognition of its domestic carbon pricing while designing IBAM as a calibrated response. A transparent, well-regulated carbon framework can help India transition from a passive recipient of global climate rules to an active rule-shaper, ensuring both economic resilience and climate responsibility.



India's Domestic Preparedness: Carbon Pricing

India has already initiated the Carbon Credit Trading Scheme (CCTS), which establishes a domestic carbon market through tradable emission certificates. Under **CBAM Article 9**, carbon prices paid domestically can be deducted from EU border taxes.

If recognised, this avoids double carbon pricing and aligns environmental and trade objectives.

Core Issue: Climate Justice and Sovereignty

CBAM raises deeper concerns of:

- Climate justice: Shifting decarbonisation burden onto developing countries
- Sovereignty: Limiting India's control over carbon pricing on its exports
- Revenue asymmetry: Carbon revenues accrue to the EU rather than exporting nations

This risks making countries like India "rule-takers" in the global green transition.

Proposed Strategy: India Border Adjustment Mechanism (IBAM)

India could respond by introducing an India Border Adjustment Mechanism (IBAM), a domestic carbon levy on exports. Key features:

- Designed in coordination with EU under FTA Annex 14-A
- Recognised as a legitimate carbon price under CBAM Article 9
- Prevents additional burden on exporters by offsetting EU charges

Critically, IBAM would retain carbon revenues within India, unlike CBAM.

PRELIMS CORNER :

1) With reference to the Government of India, consider the following information :

	Organization	Some of its functions	It works under
I	Directorate of Enforcement	Enforcement of the Fugitive Economic Offenders Act, 2018	Internal Security Division-I, Ministry of Home Affairs
II	Directorate of Revenue Intelligence	Enforces the Provisions of the Customs Act, 1962	Department of Revenue, Ministry of Finance
III	Directorate General of Systems and Data Management	Carrying out big data analytics to assist tax officers for better policy and nabbing tax evaders	Department of Revenue, Ministry of Finance

In how many of the above rows is the information correctly matched?

- (a) Only one
 (b) Only two
 (c) All the three
 (d) None

2) Consider the following:

- I. Cigarette butts
 II. Eyeglass lenses
 III. Car tyres

How many of them contain plastic?

- (a) Only one
 (b) Only two
 (c) All the three
 (d) None



WONDERS OF INDIA

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Modhera Sun Temple

The Sun Temple at Modhera in Gujarat, built in the 11th century during the reign of Bhimadeva I of the Solanki dynasty, represents a pinnacle of Maru-Gurjara architecture and a refined synthesis of art, science, and spirituality. Dedicated to Surya, the temple complex is laid out along an east-west axis, comprising the main shrine (garbhagriha and gudhamandapa), an ornate Sabha Mandapa (assembly hall), and the grand stepped Surya Kunda, reflecting a unique integration of sacred architecture with a water structure. The temple's orientation is astronomically significant, designed so that the rising sun at equinoxes illuminates the sanctum, underscoring advanced knowledge of solar movement. Architecturally, it features a richly carved pitha (base), mandovara (wall), and a now-lost shikhara, with intricate sculptural bands depicting deities, dancers, and mythological scenes. The Sabha Mandapa, with its octagonal arrangement of pillars and elaborately tiered ceiling, also portrays episodes from the Ramayana and Mahabharata. The sculptural programme is highly sophisticated, prominently featuring the twelve Adityas (forms of Surya) rendered with iconographic precision—Surya depicted standing on a chariot drawn by seven horses. The Surya Kunda, with its geometric terraces and subsidiary shrines, adds ritual and aesthetic depth to the complex. The temple exemplifies both artistic mastery and technological ingenuity, particularly in its spatial planning, sculptural detailing, and symbolic alignment with cosmic principles.



Prelims Corner: Explanations

1) The correct answer is (a)

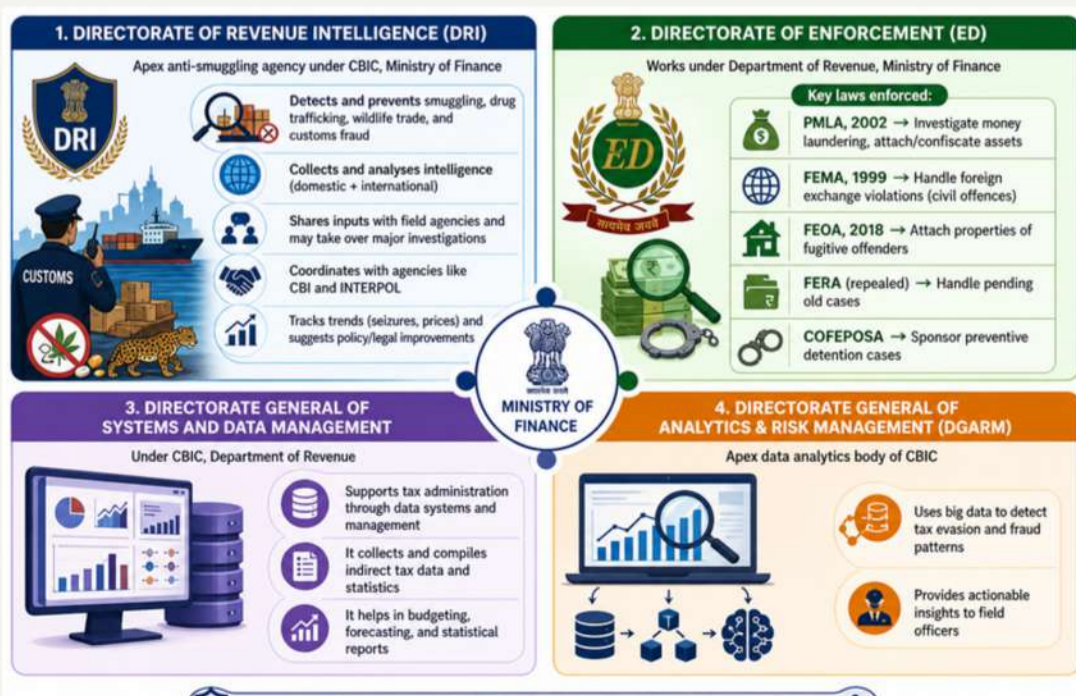
The question tests careful reading of institutional roles and parent ministries using only the given passage. A row is “correctly matched” only when both the function and the administrative control are accurate.

In Row I (Directorate of Enforcement), the function is correctly linked to the Fugitive Economic Offenders Act, 2018, as the passage clearly states that the agency can attach properties of fugitive offenders. However, the organisational placement is wrong—the ED functions under the Department of Revenue, Ministry of Finance, not under the Ministry of Home Affairs. Since one component is incorrect, the entire row is invalid.

In Row II (Directorate of Revenue Intelligence), both aspects align perfectly with the passage. The DRI enforces the Customs Act, 1962 and operates under the Central Board of Indirect Taxes and Customs (CBIC) within the Department of Revenue. Hence, this row is fully correct.

In Row III (Directorate General of Systems and Data Management), the administrative control is correctly identified under the Department of Revenue. However, the function mentioned—**big data analytics for detecting tax evasion**—actually belongs to a different body, the **Directorate General of Analytics and Risk Management (DGARM)**. This mismatch makes the row incorrect.

Therefore, only one row (Row II) is correctly matched.



2) Answer is option (C)

The question can be better understood by first grasping the concepts of critical minerals and the Mineral Security Partnership (MSP).

Critical minerals are essential raw materials used in electric vehicles, advanced batteries, and clean energy technologies, making them vital for economic growth and energy transition. However, their supply is often geographically concentrated, creating risks in global supply chains.

Mineral Security Partnership (MSP) - it is a global partnership of countries aimed at ensuring that critical minerals are securely sourced, sustainably processed, and efficiently recycled. It promotes investment, technology sharing, and resilient supply chains.

Statement I: Correct. The passage clearly states that India joined the MSP in June 2023, becoming one of its members to strengthen access to critical mineral supply chains.

Statement II: Incorrect. Although India has identified 30 critical minerals, the passage does not say that India is resource-rich in all of them. Identification does not imply abundance.

Statement III: Correct. The inclusion of 24 critical minerals in the MMDR Act gives the Central Government exclusive authority to auction mining leases for these minerals, reflecting a 2023 reform.

Conclusion: Only Statements I and III are correct.

Answer: (c) I and III only.

