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FOR UPSC CIVIL SERVICE EXAMINATION

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VIDHVATH IAS ACADEMY



1. India-Nepal Boundary Dispute: The Lipulekh Impasse

The longstanding territorial dispute over the Kalapani-Limpiyadhura-Lipulekh tri-junction has resurfaced following Nepal's formal "concerns" regarding India's planned Kailash Mansarovar Yatra. While Nepal asserts sovereign rights over the region, New Delhi maintains that the claims lack historical evidentiary backing, highlighting a complex diplomatic challenge in South Asia.

- **The Core Contention:** The dispute centers on the interpretation of the **Treaty of Sugauli (1816)**, specifically the origin of the Kali River. Nepal claims the river originates at Limpiyadhura (further west), making the entire block—including Lipulekh—Nepalese territory. India maintains the river begins at Kalapani, where the river actually takes its name.
- **Strategic Significance of Lipulekh:** Located at an altitude of over 5,000 meters, the Lipulekh Pass is a vital tri-junction point between India, Nepal, and China. For India, it is geostrategic for monitoring Chinese movements and provides the shortest trekking route for the Kailash Mansarovar Yatra.
- **The 2020 Map Controversy:** Tensions escalated in 2020 when India inaugurated an 80-km road to Lipulekh. In retaliation, Nepal passed the **Constitution (Second Amendment) Act, 2020**, updating its national emblem and political map to include the disputed 372 sq.km area, a move India termed an "artificial enlargement" of claims.
- **Diplomatic Protocol Hurdles:** Current friction is exacerbated by internal Nepalese politics. Prime Minister Balendra Shah's restrictive diplomatic protocols have complicated high-level engagements, potentially shadowing the upcoming visit of Indian Foreign Secretary Vikram Misri.
- **Bilateral Mechanism Status:** Both nations have established the **Boundary Working Group (BWG)** to resolve technical issues; however, the Kalapani and Susta segments remain "unresolved" as they require high-level political intervention rather than purely technical surveying.



Key Definitions

- **Cartographic Assertion:** The act of using maps to claim sovereignty over a territory, often used as a tool of political signaling in international relations.
- **Tri-junction:** A geographical point where the boundaries of three countries or sub-national entities meet.

Constitutional & Legal Framework

- **Treaty of Sugauli (1816):** Signed between the East India Company and the Kingdom of Nepal; it established the Mahakali River as Nepal's western boundary but left the river's source undefined.
- **Article 1 (Nepal Constitution):** Defines the territory of Nepal, which was amended in 2020 to include the disputed regions, making the claim a matter of constitutional law in Kathmandu.
- **Article 51 (Constitution of India):** Promotion of international peace and security, which guides India's preference for resolving border disputes through peaceful bilateral dialogue.

Important Key Points

- **China Factor:** Nepal's simultaneous protest to Beijing suggests an attempt to internationalize a bilateral issue, challenging the 2015 India-China agreement to expand border trade through Lipulekh.



- **Neighborhood First Policy:** The dispute tests India's "Neighborhood First" doctrine, balancing regional hegemony with the sensitivities of a smaller, landlocked sovereign neighbor.

Conclusion: The Lipulekh issue is a manifestation of "cartographic nationalism" clashing with established "administrative possession." While historical maps are subject to varied interpretations, the resolution lies in revitalizing the Joint Boundary Committee and moving beyond domestic political rhetoric. For India, maintaining the sanctity of the "Special Relationship" with Nepal is crucial to preventing a strategic vacuum that external powers might exploit.

UPSC Relevance

- **GS Paper II:** India and its Neighborhood Relations; Bilateral, Regional and Global Groupings and Agreements involving India and/or affecting India's interests.
- **GS Paper III:** Border Management; Security challenges and their management in border areas.
- **Prelims:** Mapping of the Mahakali/Kali River, Lipulekh Pass, and the geography of the Uttarakhand-Nepal border.

2. Demand for Sarna Religious Code: Identity and Constitutional Rights

The Jharkhand government has formally urged the Union to include a separate 'Sarna' religious code in the Census 2027. This demand seeks to provide a distinct identity to tribal communities who practice nature worship, ensuring their socio-religious uniqueness is reflected in official data for better policy targeting.

- **Core Demand and Context:** Chief Minister Hemant Soren has requested the President and Prime Minister to include a dedicated column for the 'Sarna' faith in the upcoming Census. This follows the Jharkhand Assembly's 2020 resolution seeking a separate code to distinguish tribal practitioners from other organized religions.
- **Demographic Evidence:** According to the 2011 Census, approximately 50 lakh people across 21 states manually identified themselves as 'Sarna' in the religion column despite the absence of a dedicated code. This highlights a significant population seeking a distinct religious identity.
- **Distinctive Features of Sarna Faith:** The faith is characterized by "Nature Worship" rather than idol worship. It centers on the protection of 'Jal, Jangal, Jameen' (Water, Forest, Land) and revolves around sacred groves (Sarnas), village deities, and rituals deeply tied to the ecological cycle.
- **Rationale for the Code:** The primary argument is that clubbing tribals under other religious categories (like Hindu or Christian) leads to the erosion of their unique cultural heritage and inaccurate demographic data. A separate code is viewed as essential for "fact-based" policymaking and balanced development.
- **Protection of Tribal Rights:** Proponents argue that a distinct identity is necessary to protect constitutional rights and ensure that welfare benefits reach the intended beneficiaries without religious ambiguity. It is also seen as a safeguard against forced or incentivized religious conversions.





- **Administrative Challenges:** While the state acknowledges that new classifications could complicate Census operations, it maintains that the long-term benefits of accurate socio-religious data outweigh these procedural hurdles, especially given the delay of the 2021 Census to 2027.

Key Definitions

- **Sarnaism:** An indigenous religious system practiced by several tribal groups (such as Munda, Oraon, Ho, and Santhal) in India, centered on the worship of nature and sacred groves.
- **Census Code:** A numerical identifier used during data collection to classify respondents into specific categories like religion, occupation, or language for statistical analysis.

Constitutional & Legal Provisions

- **Article 25:** Grants freedom of conscience and the right to freely profess, practice, and propagate religion. Tribal groups argue this includes the right to be recognized under their own distinct faith.
- **Article 29:** Mandates the protection of the interests of minorities, specifically those having a distinct language, script, or culture. Sarna followers seek protection under this cultural mandate.
- **Fifth & Sixth Schedules:** Provide for the administration of tribal areas. Accurate demographic data is vital for the effective functioning of Tribes Advisory Councils and the allocation of funds under these schedules.
- **The Census Act, 1948:** Provides the legal framework for conducting the Census. The Union Government holds the power to decide the format and categories included in the census questionnaire.

Important Key Points

- **Identity vs. Benefits:** While many tribals are categorized as Scheduled Tribes (ST) for reservation benefits, the Sarna code is specifically about religious and cultural identity, which they feel is missing in the current Hindu/Muslim/Christian/Sikh/Buddhist/Jain framework.
- **National Implications:** Though the movement is strongest in Jharkhand, it has resonance in Odisha, Chhattisgarh, West Bengal, and Bihar, making it a pan-Indian tribal identity issue.

Conclusion: The demand for a Sarna code represents a transition from "tribal identity" to "religious identity." While the administrative machinery fears fragmentation of data, the constitutional promise of pluralism supports the recognition of distinct cultural identities. A balanced approach would involve scientific data collection that respects the self-identification of indigenous communities while maintaining the integrity of the national census.

UPSC Relevance

- **GS Paper I:** Indian Society and Diversity; Salient features of Indian Society; Social Empowerment.
- **GS Paper II:** Welfare schemes for vulnerable sections; Functions and responsibilities of the Union and the States; Issues relating to the development and management of Social Sector/Services.
- **GS Paper IV:** Ethics in administration and the importance of inclusive data for distributive justice.



3. India's Cell Broadcast Alert System: Strengthening Disaster Resilience

India recently conducted a massive trial of its indigenous emergency alert system, reaching nearly 14 crore mobile users within seconds. Developed by the Centre for Development of Telematics (C-DOT), this multilingual broadcast technology aims to revolutionize the country's disaster management and public safety communication infrastructure.

- **Mechanism of Cell Broadcast:** Unlike traditional SMS, which delivers messages individually and can clog networks, Cell Broadcast sends a single message simultaneously to all handsets connected to specific mobile towers. This "one-to-many" approach ensures near-instantaneous delivery without being affected by network congestion or the absence of internet connectivity.
- **Core Features and Overrides:** The system is designed to bypass silent modes and user settings, emitting a loud, distinct buzz followed by a voice message. Its multilingual capability allows authorities to send alerts in local languages "on the fly," ensuring the message is understood by diverse populations during critical windows of time.
- **Strategic Utility:** Beyond natural calamities like earthquakes, cyclones, and floods handled by the NDMA and IMD, the system serves strategic purposes. It is equipped to provide rapid warnings during war-like situations, missile attacks, or other national security threats, similar to systems used in Israel and Ukraine.
- **Technological Sovereignty:** India has opted for an indigenously developed system by C-DOT rather than relying on global vendors. This ensures better data security, customization for Indian conditions (like regional language support), and lower long-term operational costs.
- **Future Roadmap:** The government plans to evolve this into a two-way communication tool, enabling users to request help via weblinks or Interactive Voice Response (IVR) systems. Plans are also underway to integrate this emergency alert technology into television broadcasting for wider reach.



Key Definitions

- **Cell Broadcast Service (CBS):** A mobile technology feature that allows a mobile network operator to send messages to all mobile phone users in a specific geographical area.
- **Model Code of Conduct (MCC):** A set of guidelines issued by the Election Commission of India to regulate the conduct of political parties and candidates during elections, which led to the exclusion of certain states from the recent alert trial.

Constitutional & Legal Provisions

- **Disaster Management Act, 2005:** Provides the legal framework for disaster management in India. The new alert system directly supports the mandate of the National Disaster Management Authority (NDMA) to ensure timely early warnings.
- **Article 21 (Right to Life):** The state has a constitutional obligation to protect the lives of its citizens. Providing timely alerts during life-threatening disasters is a functional extension of this right.



- **Indian Telegraph Act, 1885:** Regulates the use of telegraphs and telecommunications in India, providing the government with powers to take over or monitor networks during public emergencies.

Important Key Points

- **Global Precedents:** India joins a select group of nations like Japan (earthquake alerts), the US (Wireless Emergency Alerts), and Israel (missile warnings) that utilize broadcast tech for civilian safety.
- **Eliminating Panic:** While the loud buzz caused temporary panic among some users, the government emphasized that pre-trial SMS notifications and press releases are crucial for public sensitization to avoid chaos during real emergencies.

Conclusion: The rollout of the Cell Broadcast Alert System marks a shift from reactive to proactive disaster management in India. By leveraging indigenous technology to overcome the limitations of SMS and internet-dependent apps, India is building a robust digital fortress. The success of this system will ultimately depend on its seamless integration with state-level disaster agencies and the continuous upgrading of older mobile handsets to support this protocol.

UPSC Relevance

- **GS Paper II:** Governance and Role of Government Agencies (NDMA/C-DOT); Issues relating to development and management of Social Sector/Services.
- **GS Paper III:** Disaster Management (Early Warning Systems); Science and Technology-developments and their applications and effects in everyday life; Internal Security challenges.
- **Prelims:** Awareness of C-DOT, NDMA, and the technical difference between SMS and Cell Broadcasting.

4. Expansion of Samarth Panchayat Portal: Towards Fiscal Decentralization

The Ministry of Panchayati Raj is expanding the "Samarth Panchayat" portal to major states like Uttar Pradesh, Maharashtra, and Assam following successful pilot runs in Himachal Pradesh and Chhattisgarh. This digital initiative aims to enhance the financial autonomy of Gram Panchayats by streamlining the collection of Own Source Revenue (OSR) and ensuring transparent local governance.

- **Objective and Scope:** The Samarth portal is a unified digital platform designed to digitize the demand, collection, and management of both tax and non-tax revenues. It covers 2,66,999 panchayats across India, with a primary focus on making local bodies "Atmanirbhar" (self-reliant) by reducing their absolute dependence on Central and State grants.
- **Key Functional Features:** The platform enables online demand generation, digital payment collection (via UPI, cards, and net banking), and real-time revenue monitoring. It also includes an "Asset Management" module to track and monetize panchayat-owned properties like community halls, shops, and ponds.
- **Strengthening Fiscal Autonomy:** By providing a structured mechanism to collect House Tax, Water Charges, and License Fees, the portal helps Panchayats build their "Own Source Revenue" (OSR). This financial pool allows local bodies to address specific community needs that might not be covered under rigid central schemes.
- **Transparency and Accountability:** The portal features a real-time dashboard that tracks revenue performance. This "digitization of records" minimizes manual errors, prevents leakages, and fosters



trust among rural taxpayers by providing digital receipts and clear accounting of how local taxes are utilized.

- **Assam's Strategic Inclusion:** The expansion into Assam is significant as it serves as a gateway for digital governance in the Northeast. It addresses the unique administrative challenges of the region and integrates the traditional local governance structures with modern fiscal technology.

Key Definitions

- **Own Source Revenue (OSR):** Revenue generated by Panchayats through their own internal powers of taxation and non-tax levies (e.g., property tax, market fees, and user charges for sanitation).
- **Fiscal Decentralization:** The process of devolving taxing and spending powers to lower levels of government (like Panchayats) to ensure that local needs are met with local resources.



Constitutional & Legal Provisions

- **Article 243-H:** Specifically empowers State Legislatures to authorize Panchayats to levy, collect, and appropriate certain taxes, duties, tolls, and fees.
- **73rd Constitutional Amendment Act, 1992:** Mandated the creation of a three-tier Panchayati Raj system and provided the structural basis for financial devolution to local bodies.
- **Article 243-I:** Mandates the constitution of a State Finance Commission (SFC) every five years to review the financial position of Panchayats and recommend the distribution of taxes between the State and local bodies.

Important Key Points

- **The Finance Commission Link:** The 15th and 16th Finance Commissions have increasingly linked "Performance Grants" for local bodies to their ability to show an upward trend in OSR collection, making portals like Samarth a prerequisite for higher funding.
- **Atmanirbhar Panchayat Initiative:** This portal is a core component of the government's vision to transform Gram Panchayats into self-governing economic units rather than just implementing agencies for central schemes.

Conclusion: The expansion of the Samarth Panchayat portal represents a transition from "administrative" decentralization to "fiscal" empowerment. While the digital infrastructure is a leap forward, its ultimate success will depend on the "willingness to tax" at the local level and the capacity building of rural officials to manage these digital systems effectively.

UPSC Relevance

- **GS Paper II:** Functions and responsibilities of the Union and the States; Devolution of powers and finances up to local levels and challenges therein; e-Governance applications.
- **GS Paper III:** Inclusive growth and issues arising from it; Mobilization of resources.

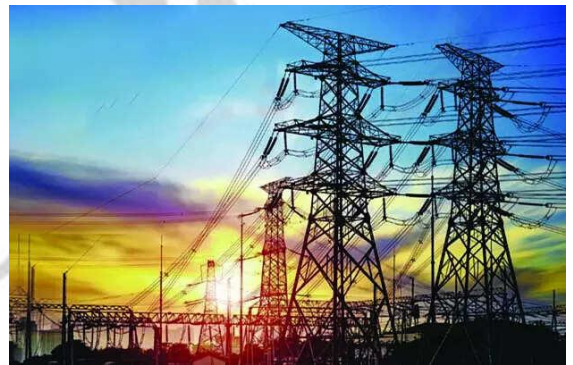


- **Prelims:** Powers of Panchayats under the 11th Schedule; Role of C-DOT or NIC in developing governance portals.

5. Indian Power Market: The Phenomenon of Zero-Price Electricity

On May 1, 2026, India's power exchange witnessed a historic event as electricity prices hit zero for the first time in specific time blocks. This occurrence, driven by record solar generation and a sudden dip in demand, highlights the growing complexities of grid management as India aggressively pursues its ambitious target of 500 GW non-fossil fuel capacity by 2030.

- **Supply-Demand Mismatch:** The price crash was triggered by a "perfect storm" of high supply and low demand. Record solar generation (reaching ~57.5 GW) coincided with cooler weather and light rains in Northern and Eastern India, which lowered cooling requirements. Additionally, industrial demand dropped significantly due to the Labour Day holiday.
- **Inflexible Thermal Base:** A critical factor in zero pricing is the "inflexibility" of thermal power plants. Unlike solar or hydro, coal-fired plants cannot be switched off and on rapidly. To maintain grid frequency at the mandatory 50 Hz, these plants continue generating even when demand is low, leading to a massive oversupply on the exchange.
- **Market Dynamics on IEX:** On the Real-Time Market (RTM) platform of the Indian Energy Exchange (IEX), sell bids reached 46 GW against purchase bids of only 6 GW during the affected blocks. While exchange-traded power accounts for only 13% of total supply (the rest being long-term PPAs), it acts as a crucial barometer for the health of India's energy ecosystem.
- **The Case for Negative Pricing:** Experts suggest that India may eventually need to follow the European and Australian models of "negative pricing." This mechanism essentially pays consumers or storage operators to take excess power off the grid, providing a financial incentive to balance supply and prevent grid instability.
- **Storage as a Solution:** The price crash is viewed not as a lack of demand for renewables, but as an urgent signal for Battery Energy Storage Systems (BESS) and Pumped Hydro Storage. Capturing excess daytime solar energy to meet evening peak demand is essential to prevent value erosion for renewable energy developers.



Key Definitions

- **Real-Time Market (RTM):** A market segment on power exchanges that allows participants to buy or sell electricity just an hour before delivery, helping in managing last-minute demand-supply variations.
- **Grid Frequency:** Measured in Hertz (Hz), it represents the balance between power generation and load. In India, it must stay near 50 Hz; oversupply increases frequency, while undersupply decreases it, both risking grid collapse.
- **Open Access Consumers:** Large consumers (typically with a load of 1 MW or more) who are permitted to buy power directly from the market or private generators rather than relying solely on local Discoms.



Constitutional & Legal Provisions

- **The Electricity Act, 2003:** The foundational legal framework that de-licensed generation and introduced competition through power exchanges. It mandates the "Security of the Grid" as a primary responsibility of the Load Despatch Centers.
- **Article 246 (Seventh Schedule):** Electricity is a "Concurrent List" subject (Entry 38), meaning both the Union and State governments can legislate on it, necessitating coordinated efforts for grid balancing.
- **CERC Regulations:** The Central Electricity Regulatory Commission (CERC) frames the rules for market operations and grid codes that govern how prices are discovered and how surpluses are handled on the exchange.

Important Key Points

- **Impact on Investment:** Frequent zero-price events can discourage private investment in renewable energy if developers cannot realize value for the power generated during peak sun hours.
- **Optimization Opportunity:** For Distribution Companies (Discoms) and industrial users, these price dips offer a chance to significantly lower power procurement costs by shifting flexible loads to daytime slots.

Conclusion: The occurrence of zero-priced power is a "growing pain" of India's energy transition. It underscores that the challenge is no longer just about "adding capacity," but about "integrating flexibility." Moving forward, the focus must shift toward mandatory energy storage obligations, demand-side management, and potentially evolving market rules to include negative pricing to ensure a stable and financially viable green energy future.

UPSC Relevance

- **GS Paper III:** Infrastructure (Energy); Economic Development; Science and Technology (Renewable Energy and Grid Management); Environmental impact of energy transition.
- **GS Paper II:** Government policies and interventions for development in various sectors.
- **Prelims:** Understanding of Indian Energy Exchange (IEX), Grid Frequency (50 Hz), and India's NDC targets (500 GW non-fossil capacity by 2030).

6. Transition to VB-GRAM G: Analyzing the Decline in Rural Job Demand

The Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), recently rebranded as the **Viksit Bharat Guarantee for Rozgar and Ajeevika Mission Gramin (VB-GRAM G)**, witnessed a significant 36% year-on-year decline in work demand this April. This shift reflects a combination of structural transitions, seasonal agricultural cycles, and a strengthening broader economy that is beginning to absorb rural surplus labor.

- **Significant Quantitative Dip:** Only 17.5 million individuals sought work in April 2026, compared to 27.2 million in April 2025. This downward trend has been consistent since mid-2025, with monthly declines ranging between 11% and 36%, signaling a departure from the high-demand years of the early 2020s.
- **The "Automatic Stabilizer" Effect:** Economists view the scheme as an economic cycle tracker. The current decline is largely attributed to a robust 2025 monsoon and a productive Rabi harvest season, which naturally redirected the labor force toward active farm work and away from government-guaranteed manual labor.



- **Industrial Absorption:** A 4.1% growth in the Index of Industrial Production (IIP) for March 2026, driven by manufacturing and mining, suggests that secondary sector activities are picking up. This revival likely provided alternative employment opportunities, reducing the reliance on the rural safety net.
- **Structural Transition Challenges:** The rebranding and shift to the VB-GRAM G iteration in April 2026 may have introduced temporary implementation hurdles. As states transition to new digital and administrative frameworks, data reporting and work allocation might experience a stabilization period.
- **Demand-Driven Nature:** Despite the dip, the government maintains the scheme's demand-driven character. Officials have instructed states to maintain a "shelf of works" to ensure that should rural distress resurface, the infrastructure to provide immediate employment remains intact.



Key Definitions

- **Automatic Stabilizer:** An economic tool or program that naturally offsets fluctuations in an individual's or nation's economic activity without explicit government intervention.
- **Shelf of Works:** A pre-approved list of projects (like pond excavation or road building) kept ready by local authorities to be initiated as soon as workers demand employment.

Constitutional & Legal Provisions

- **Article 41:** Directive Principle of State Policy (DPSP) which mandates the State to secure the right to work, to education, and to public assistance in cases of unemployment.
- **Section 3(1) of the MGNREG Act, 2005:** Legally guarantees at least 100 days of wage employment in a financial year to every rural household whose adult members volunteer to do unskilled manual work.
- **Article 21:** The Right to Life has been interpreted by the Judiciary to include the Right to Livelihood, which provides the moral and legal bedrock for such guarantee missions.

Important Key Points

- **VB-GRAM G Transition:** The new iteration focuses on transforming the scheme from simple "work provision" to "Ajeevika" (Livelihood) mission, emphasizing asset creation that leads to long-term income.
- **Seasonality Factor:** Historically, demand for MGNREGS/VB-GRAM G peaks during the "lean period" (summer) but dips during the sowing and harvesting seasons (Kharif and Rabi).

Conclusion: The 36% drop in rural job demand should be interpreted as a sign of rural economic resilience rather than a failure of the scheme. As the labor force moves toward farm activities and the industrial sector, the VB-GRAM G is performing its intended role as a fallback mechanism. However, ensuring that the administrative transition to the new mission format does not exclude genuine seekers remains the primary challenge for the Rural Development Ministry.



UPSC Relevance

- **GS Paper II:** Government policies and interventions for development in various sectors and issues arising out of their design and implementation; Welfare schemes for vulnerable sections.
- **GS Paper III:** Indian Economy and issues relating to planning, mobilization of resources, growth, development, and employment; Poverty and Unemployment.
- **Prelims:** Features of MGNREGS/VB-GRAM G, Index of Industrial Production (IIP), and the concept of "Demand-driven" schemes.

7. Anti-Sanction Legislation: Protecting Domestic Interests from Extra-Territorial Laws

The Government of India is exploring the feasibility of enacting a law modeled after the European Union's "Blocking Statute" to protect domestic entities from the adverse effects of third-country sanctions. This move aims to prevent the disruption of critical digital infrastructure and services by foreign corporations that might comply with unilateral sanctions imposed by foreign jurisdictions like the US.

- **The EU Blocking Statute Model:** New Delhi is studying the 1996 EU framework which acts as a "shield" for domestic companies against the extra-territorial application of third-country laws. This statute nullifies the effect of foreign court rulings or administrative decisions within the domestic territory, ensuring that local firms are not forced to comply with external sanctions that conflict with national interests.
- **Trigger for Policy Action:** A major catalyst for this deliberation was a 2025 incident where Microsoft suspended IT services for Nayara Energy, an Indo-Russian oil refining firm, citing foreign sanctions. Such sudden disruptions highlight the extreme vulnerability of Indian critical infrastructure to the compliance policies of global technology giants.
- **Reducing Digital Dependency:** The proposal underscores deep-seated concerns regarding the over-dependence of Indian companies on foreign digital infrastructure. By creating a legal barrier, India seeks to ensure that critical IT and marketing services remain operational regardless of geopolitical shifts or foreign legislative maneuvers.
- **Sovereignty in Commerce:** The proposed law is envisioned as a mechanism to assert India's economic sovereignty. It intends to provide a legal basis for Indian companies to continue business operations with sanctioned nations (like Russia or Iran) without fear of being abandoned by foreign service providers operating within India.
- **Compelling Need for a Mechanism:** Senior officials have emphasized that having a "template" like the EU anti-sanctions law is on the table to mitigate risks to vital digital infrastructure. The focus is on preventing foreign companies from unilaterally withdrawing essential services provided to Indian entities based on foreign jurisdictions.



Key Definitions

- **Blocking Statute:** A law designed to prevent the application of foreign extra-territorial legislation within a domestic territory, essentially "blocking" the enforcement of foreign sanctions.



- **Extra-territorial Application:** When a country applies its laws to people, activities, or entities outside its own physical borders or jurisdiction.

Constitutional & Legal Provisions

- **Article 51:** A Directive Principle of State Policy that mandates the state to foster respect for international law and treaty obligations, while also promoting international peace and security based on sovereign equality.
- **Public Policy of India:** A legal doctrine used to refuse the enforcement of foreign judgments or contracts that are contrary to the fundamental interests of the nation or its legal system.
- **The Civil Procedure Code, 1908 (Section 13):** Governs when foreign judgments are not conclusive in India, providing a legal precedent for rejecting external legal dictates that violate domestic laws.

Important Key Points

- **Shielding Indo-Russian Trade:** Given India's significant energy and defense ties with Russia, an anti-sanction law would provide critical legal protection for Indian firms involved in these sectors against Western "secondary sanctions."
- **Global Precedents:** Apart from the EU, countries like China have also enacted "Anti-Foreign Sanctions" laws recently to counter Western economic pressure, indicating a global trend toward protecting economic sovereignty.

Conclusion: Enacting an EU-like blocking statute would be a bold step toward "strategic autonomy" in the economic and digital spheres. While it may create friction with global tech companies and Western regulators, it is a necessary safeguard to protect India's critical services from becoming collateral damage in geopolitical conflicts. Success will depend on balancing these protective measures with the need to remain an attractive destination for foreign direct investment.

UPSC Relevance

- **GS Paper II:** Effect of policies and politics of developed and developing countries on India's interests; International Relations; Bilateral groupings and agreements involving India.
- **GS Paper III:** Challenges to internal security through communication networks; Basics of cyber security; Indian Economy and issues relating to planning and mobilization of resources.
- **Prelims:** Concepts of Blocking Statutes, Extra-territoriality, and India's energy/digital trade dependencies.

8. Mission Drishti: Revolutionizing Earth Observation via OptoSAR Technology

The Indian space startup GalaxEye has achieved a global milestone by launching 'Drishti', the world's first satellite capable of capturing simultaneous optical and radar images of the same location. Launched via a SpaceX Falcon 9 rocket from California, this satellite addresses a critical gap in Earth observation by integrating two distinct imaging technologies onto a single platform.

- **The OptoSAR Innovation:** Drishti is the first satellite equipped with "OptoSAR" technology, which synchronizes optical sensors and Synthetic Aperture Radar (SAR). While optical sensors provide intuitive, high-resolution photos, they are limited by clouds and darkness; SAR uses microwave signals to penetrate these barriers but produces complex images that are difficult to interpret.
- **Overcoming Tropical Challenges:** Most global satellite companies cater to Western nations with clearer skies. Drishti is specifically engineered for tropical conditions like India's, where frequent



cloud cover and monsoon weather often blind traditional optical satellites, ensuring consistent data availability.

- **Simultaneous Data Synchronization:** Previously, users had to manually align data from different satellites taken at different times, often leading to inaccuracies due to ground-level changes. Drishti eliminates this by taking both image types at the exact same instant, providing a comprehensive and real-time view of any location.
- **AI-Driven Image Synthesis:** GalaxEye utilizes Artificial Intelligence to translate SAR data into optical-like images. This allows users to understand what is happening on the ground even when the optical sensor is blinded by smoke or heavy cloud cover, making space imagery accessible to non-experts.
- **Private Sector Prowess:** Developed by alumni of IIT Madras, this is the largest privately built satellite in India. It joins a growing list of Indian space-tech achievements by startups like Pixxel, Skyroot, and Agnikul Cosmos, reflecting the success of the government's space sector reforms.



Key Definitions

- **Synthetic Aperture Radar (SAR):** An active data collection method where a sensor transmits its own microwave signals and measures the reflection to create images, unaffected by weather or light.
- **OptoSAR:** A proprietary technology stack that allows optical and radar sensors to operate in perfect sync on the same satellite platform.

Constitutional & Legal Provisions

- **Article 51A(h):** Part of the Fundamental Duties, it mandates every citizen to develop the scientific temper, humanism, and the spirit of inquiry and reform, which is exemplified by indigenous space-tech innovation.
- **Space Policy 2023:** The legal framework that opened the space sector to private players (Non-Government Entities), facilitating startups like GalaxEye to lead missions previously reserved for ISRO.
- **The Geospatial Data Guidelines (2021):** Liberalized the acquisition and production of geospatial data, allowing Indian startups to operate Earth observation satellites with greater autonomy.

Important Key Points

- **Strategic Utility:** Simultaneous imaging is vital for disaster management (floods/cyclones), defense surveillance (border monitoring through clouds), and precision agriculture.
- **Global First:** While SAR and optical sensors exist separately, the technological feat of putting them on one satellite and making them "look" at the same spot simultaneously is a first in global space history.

Conclusion: The launch of Drishti marks the transition of the Indian space sector from a state-led model to a vibrant, startup-driven ecosystem. By solving the "cloud cover" problem inherent to tropical geographies, GalaxEye has created a globally competitive product that enhances India's strategic and commercial capabilities in Earth observation.



UPSC Relevance

- **GS Paper III:** Science and Technology—developments and their applications and effects in everyday life; Achievements of Indians in science & technology; Indigenization of technology and developing new technology; Awareness in the fields of Space.
- **Prelims:** Understanding of SAR vs. Optical sensors, OptoSAR technology, and major private players in the Indian space sector (GalaxEye, Skyroot, Pixxel).

9. Indigenous Naval Strength: The Naval Anti-Ship Missile Short Range (NASM-SR)

The Defence Research and Development Organisation (DRDO) and the Indian Navy recently achieved a milestone by successfully test-launching a salvo of Naval Anti-Ship Missiles Short Range (NASM-SR) from a helicopter off the Odisha coast. This indigenously developed system is designed to replace aging foreign stockpiles, providing the Navy with a highly adaptable and lethal edge in littoral warfare.

- **Successful Salvo Capability:** The recent test involved a "salvo launch," where two missiles were fired in quick succession from the same helicopter. This capability is critical in modern naval combat to overwhelm the sophisticated air defense systems of hostile vessels through sheer volume and precision.
- **Superiority over Sea Eagle:** The NASM-SR is set to replace the British-origin Sea Eagle missiles currently used on Sea King helicopters. While a single Sea Eagle weighs 580 kg, the NASM-SR is significantly lighter at 380 kg, allowing helicopters to carry a higher number of missiles and strike from a safer standoff range of 55 km.
- **Advanced "Man-in-the-Loop" Tech:** Unlike older "fire-and-forget" missiles, the NASM-SR features a two-way data link that allows a human operator to adjust the missile's path mid-flight. This minimizes the risk of collateral damage in crowded maritime corridors and ensures the missile can hit moving or decoyed targets effectively.
- **Lethal Waterline Hit Precision:** The missile is designed for a "waterline hit," striking a vessel at the point where the hull meets the water. Damage at this vulnerable location causes rapid flooding, which can quickly disable or sink a ship, a capability that was largely absent in the previous generation of short-range naval missiles.
- **Sophisticated Subsystems:** The missile utilizes a solid propulsion booster for initial thrust and a long-burn sustainer engine for extended flight. It is equipped with an advanced seeker for target tracking, a radio altimeter for sea-skimming, and a proximity fuse that detonates when the missile is at an optimal distance from the target.
- **Collaborative Development:** The project highlights the strength of the domestic defense ecosystem, with premier DRDO labs in Hyderabad, Pune, and Chandigarh partnering with private sector entities, MSMEs, and startups to ensure the mass production of these high-tech assets.



Key Definitions

- **Salvo Launch:** The firing of multiple missiles or projectiles in rapid succession at a single target or multiple targets to saturate enemy defenses.



- **Sea-Skimming:** A flight profile where a missile flies at a very low altitude, just above the water surface, to evade enemy radar and point-defense systems.

Constitutional & Legal Provisions

- **Seventh Schedule (Entry 1, Union List):** "Defence of India" is an exclusive Union subject, mandating the Central Government to ensure the modernization and self-reliance of the Armed Forces.
- **Article 51A(d):** Fundamental Duty of every citizen to defend the country and render national service when called upon to do so, which is supported by the development of indigenous defense technology.
- **Defence Acquisition Procedure (DAP) 2020:** The policy framework that prioritizes "Make in India" (IDDM - Indigenously Designed, Developed, and Manufactured) categories for defense procurement.

Important Key Points

- **Standoff Range:** The missile's 55-km range allows Navy helicopters to engage hostile fast-attack crafts or smaller vessels without entering the effective range of their surface-to-air defenses.
- **Strategic Autonomy:** By replacing 1980s-era British missiles with homegrown technology, India reduces its dependence on foreign Original Equipment Manufacturers (OEMs) for spares and upgrades during conflict.

Conclusion: The NASM-SR is not just a technological upgrade but a strategic necessity for the Indian Navy's ship-borne aviation wing. Its lighter weight, "man-in-the-loop" flexibility, and specific waterline hit capability transform standard utility helicopters into potent anti-access/area-denial (A2/AD) platforms. This success reinforces India's commitment to "Aatmanirbharta" in high-end missile technology.

UPSC Relevance

- **GS Paper III:** Science and Technology—developments and their applications; Achievements of Indians in science & technology; Indigenization of technology; Security challenges and their management in border areas.
- **GS Paper II:** Government policies and interventions for development in various sectors.
- **Prelims:** Features of NASM-SR, understanding "Man-in-the-loop" vs. "Fire-and-forget," and the role of DRDO in naval indigenization.

10. Artificial Intelligence and Global Security: The Gathering Storm of Unchecked Power

The rapid integration of Artificial Intelligence (AI) into warfare, surveillance, and economic structures has triggered a global debate on the erosion of democratic safeguards. As tech giants prioritize "hard power" and autonomous weaponization, the lack of binding international regulation poses a fundamental threat to human rights and national sovereignty.

- **Shift to Hard Power:** Leading tech firms like Palantir now argue that the survival of democratic societies depends on "hard power" built on software rather than moral appeal. This philosophy shifts the focus from "whether" AI will be used for weaponry to "who" will control these tools and for what purpose.
- **AI in Modern Warfare:** The deployment of AI-powered systems, such as the Maven Smart System, has already led to devastating consequences. Reports indicate its use in target selection for military



strikes, including an incident in Iran resulting in significant civilian casualties, underscoring the lethal risks of algorithmic warfare.

- **The "Constitutional" Mirage:** Some AI developers, like Anthropic, have implemented internal "constitutions" or moral precepts for their models (e.g., Claude). However, critics remain skeptical, viewing these as private attempts to bypass public accountability and state-led regulation.
- **Surveillance and Civil Liberties:** Beyond the battlefield, AI software is increasingly utilized for predictive policing and mass surveillance. These tools often rely on biased profiling and the exploitation of personal data, leading to a breach of privacy and the erosion of fundamental civil liberties.
- **The Regulatory Gap:** While the United States has been slow to legislate, international figures like Brazil's President Lula da Silva have called for mandatory regulation to protect human rights and creative industries. Current frameworks, such as the EU AI Act and India's 2025 Governance Guidelines, represent steps toward oversight but often lack binding multilateral enforcement.
- **Economic and Social Disruption:** The "Intelligence Age" is expected to fundamentally reshape work, knowledge, and production. Unchecked expansion threatens to deepen global inequalities by concentrating power within a few corporations and nations, further marginalizing the Global South.



Key Definitions

- **Hard Power:** The use of military or economic might to influence the behavior of other political bodies, now increasingly defined by superior software and AI capabilities.
- **Large Language Models (LLMs):** Advanced AI systems trained on vast datasets of human writing to generate text, perform coding, and simulate human reasoning, raising significant copyright and ethical concerns.
- **Predictive Policing:** The use of mathematical and analytical techniques by law enforcement to identify potential criminal activity, which has faced criticism for inherent racial and social biases.

Constitutional & Legal Provisions

- **Article 21 (Right to Life and Privacy):** In the Indian context, the Supreme Court has recognized privacy as a fundamental right. AI-driven surveillance and data exploitation directly challenge this constitutional protection.
- **EU Artificial Intelligence Act:** The world's first comprehensive legal framework for AI, which categorizes AI systems by risk level and prohibits certain intrusive practices, serving as a global regulatory template.
- **India's AI Governance Guidelines (2025):** A policy document recognizing AI-related risks but currently stopping short of legislative intervention, focusing instead on ethical voluntary adoption.

Important Key Points

- **The "Thatcherite Trap":** The dangerous societal assumption that "there is no alternative" to the current trajectory of AI development, which frames ideological corporate choices as historical inevitabilities.



- **Digital Sovereignty:** The imperative for nations to regulate big tech to prevent the erosion of national information integrity and the exploitation of domestic data by foreign corporations.

Conclusion: The rise of AI as a tool for warfare and surveillance represents a pivot point in human history. Relying on the "moral soul" of private corporations to regulate a technology that reshapes work and knowledge is a gamble with democratic accountability. A just future requires moving beyond "soft" guidelines toward binding, multilateral frameworks that prioritize human rights over technological expansion.

UPSC Relevance

- **GS Paper II:** Effect of policies and politics of developed and developing countries on India's interests; International Relations; Pressure groups and formal/informal associations and their role in the Polity.
- **GS Paper III:** Science and Technology—developments and their applications; Challenges to internal security through communication networks; Role of media and social networking sites in internal security challenges.
- **GS Paper IV (Ethics):** Ethical concerns and dilemmas in government and private institutions; Strengthening of ethical and moral values in governance.

11. EU's CBAM and India's Strategic Response: Navigating Carbon Diplomacy

On January 1, 2026, the European Union's Carbon Border Adjustment Mechanism (CBAM) became fully operational, imposing carbon-based charges on energy-intensive imports like steel, aluminum, and cement. While framed as a measure for "fair competition," the mechanism creates a significant disadvantage for Indian exporters who lack the heavy decarbonization subsidies and free allowances enjoyed by their European counterparts.

- **The "Level Playing Field" Imbalance:** European producers benefit from subsidized public finance and free emission allowances under the EU Emissions Trading System (ETS) until 2034. In contrast, Indian exporters face the full weight of CBAM charges, a tilt that challenges the spirit of GATT Article III, which prohibits using internal charges to protect domestic industries.
- **India-EU FTA and Annex 14-A:** The India-EU Free Trade Agreement, concluded on January 27, 2026, provides no specific exemption for India from CBAM. However, "Annex 14-A" establishes a formal technical dialogue to determine how carbon prices paid in India can be credited at the EU border, alongside a "Most-Favoured-Nation" commitment regarding any future flexibilities.
- **Climate Justice and Revenue Sovereignty:** A core concern is that CBAM shifts the burden of Europe's decarbonization onto developing nations while keeping the collected revenue in European hands. This risks turning India into a "rule-taker" in the global green transition rather than a sovereign "rule-maker" that directs its own carbon revenues.
- **Leveraging CCTS and CBAM Article 9:** India's Carbon Credit Trading Scheme (CCTS), notified in 2023, provides the legal basis for offsetting CBAM charges. Under Article 9 of the CBAM Regulation, EU importers can deduct carbon prices already paid in the country of origin, making India's domestic carbon market a critical tool for international compliance.





- **The "IBAM the CBAM" Strategy:** India is exploring an "India Border Adjustment Mechanism" (IBAM) to collect carbon charges at the point of export. By coordinating this through the FTA's technical dialogue, India can ensure these domestic payments are recognized as offsets by the EU, effectively keeping carbon tax revenues at home to fund indigenous green projects.

Key Definitions

- **Carbon Border Adjustment Mechanism (CBAM):** A landmark EU tool that puts a fair price on the carbon emitted during the production of carbon-intensive goods entering the EU, encouraged to prevent "carbon leakage".
- **Carbon Credit Trading Scheme (CCTS):** India's domestic compliance-grade market where industries hold tradable certificates against measured emissions, establishing a rupee-denominated carbon price.

Constitutional & Legal Provisions

- **GATT Article III:** A foundational principle of international trade law that requires "National Treatment," barring countries from applying internal taxes or regulations to imports in a way that protects domestic production.
- **CBAM Regulation Article 9:** A legal provision allowing for the reduction of CBAM certificates based on the carbon price already effectively paid in the country of origin.
- **Article 253 of the Indian Constitution:** Empowers Parliament to make any law for the whole or any part of India for implementing any treaty, agreement, or convention with any other country, which would govern the implementation of the India-EU FTA and any reciprocal carbon measures.

Important Key Points

- **Ring-fenced Revenues:** Any funds raised through an Indian counter-adjustment (IBAM) would be restricted to green projects, such as modernizing blast furnaces and scaling hydrogen-based steelmaking.
- **Technical Dialogue:** Annex 14-A is the primary lever for India to negotiate the monitoring, verification, and exchange-rate conversion of its domestic carbon prices to ensure they are fully credited by the EU.

Conclusion: India's strategy must evolve from protesting CBAM to constructively "internalizing" it through domestic mechanisms like IBAM and CCTS. By ensuring that carbon payments made by Indian producers stay within the country to finance its own green transition, India can maintain its economic sovereignty and climate justice principles while engaging with a carbon-priced global trade order.

UPSC Relevance

- **GS Paper II:** Bilateral, regional, and global groupings and agreements involving India and/or affecting India's interests; Effect of policies and politics of developed and developing countries on India's interests.
- **GS Paper III:** Conservation, environmental pollution and degradation, environmental impact assessment; Indian Economy and issues relating to mobilization of resources.
- **Prelims:** Understanding CBAM, CCTS, GATT Article III, and the role of the 15th Finance Commission in green financing.



12. Iran's Nuclear Ambiguity: Threshold Status and Global Security

The geopolitical standoff over Iran's nuclear program has intensified as Tehran maintains its status as a "threshold state." While Iranian leadership has historically cited religious prohibitions against nuclear weapons, the shifting security landscape in West Asia and the collapse of previous diplomatic agreements have created a high-stakes environment of "strategic ambiguity."

- **The NPT and the "Fuzzy Barrier":** The Treaty on the Non-Proliferation of Nuclear Weapons (NPT) allows for civilian nuclear programs—such as power generation and medical isotope production—but prohibits the development of weapons. This creates a "capability gap" where a nation can legally acquire the technology needed for a bomb (like uranium enrichment) under the guise of peaceful use, provided they do not cross the line into actual weaponization.
- **Iran as a Threshold State:** A "threshold state" is a country that possesses all the technical components and fissile material required to build a nuclear weapon but stops just short of final assembly. Experts estimate Iran's "breakout time"—the period needed to produce enough weapons-grade material for a warhead—is now measured in mere weeks.
- **Enrichment and the 90% Hurdle:** While civilian reactors require uranium enriched to less than 20%, weapons-grade material requires 90%. Iran currently possesses stockpiles enriched to 60%; technically, the transition from 60% to 90% is much shorter and faster than the initial enrichment stages, placing Tehran on the literal cusp of nuclear capability.
- **Religious Jurisprudence vs. Strategic Expediency:** Iran reconciles its nuclear stockpile with its religious stance through a "fatwa" (Islamic ruling) by former leader Ayatollah Khamenei, which forbids nuclear weapons as *haram* (prohibited). However, the doctrine of *Maslahat-e-Nizam* (Expediency of the System) allows leadership to supersede previous rulings if the state faces an existential threat, providing a theological loophole for policy shifts.
- **The Consequences of Uncertainty:** The lack of clarity regarding a state's nuclear intent often leads to a "nuclear cascade," where neighboring countries feel compelled to arm themselves to maintain a balance of power. This uncertainty limits diplomatic options and increases the risk of "pre-emptive" military strikes by adversaries, such as the U.S. or Israel, aiming to eliminate the threshold capability.

Key Definitions

- **Breakout Time:** The duration required for a state to produce enough weapons-grade fissile material (90% enriched uranium) for a single nuclear weapon.
- **Uranium Enrichment:** The process of increasing the percentage of the isotope Uranium-235. Low-enriched uranium (LEU) is used for power, while highly-enriched uranium (HEU) is used for research (20%) or weapons (90%).
- **Downblending:** The technical process of mixing highly enriched uranium with natural or slightly enriched uranium to reduce its concentration for civilian use.

Constitutional & Legal Provisions

- **The NPT (Treaty on the Non-Proliferation of Nuclear Weapons):** An international treaty whose objective is to prevent the spread of nuclear weapons and weapons technology, to promote cooperation in the peaceful uses of nuclear energy.
- **JCPOA (Joint Comprehensive Plan of Action):** The 2015 "Iran Deal" which placed significant restrictions on Iran's nuclear program in exchange for sanctions relief; the U.S. unilaterally withdrew from this agreement in 2018.



- **IAEA Safeguards:** Agreements that allow the International Atomic Energy Agency to verify that a state is living up to its international commitments not to use nuclear programs for weapons purposes.

Important Key Points

- **The Iran-Iraq War Legacy:** Iran's refusal to use chemical weapons during the 1980s war was a "moral victory," but the failure of the UN to punish Iraq for using them led Tehran to reconsider the necessity of a robust deterrent.
- **Existential Threats:** Current Iranian leadership views regional aggression and the assassination of its scientists as existential threats that may justify "valorous duty" to defend the nation using all available means.

Conclusion Iran has mastered the art of "nuclear hedging"—staying within the technical limits of the NPT while building the capacity to breakout at will. This strategy serves as a potent diplomatic lever and a security shield. However, as the gap between "ability" and "possession" narrows, the traditional tools of the non-proliferation regime—sanctions and inspections—face diminishing returns, leaving the world in a fragile state of nuclear anxiety.

UPSC Relevance

- **GS Paper II:** Effect of policies and politics of developed and developing countries on India's interests; International Relations; Important International institutions (IAEA, UN Security Council).
- **GS Paper III:** Science and Technology—developments and their applications; Role of external state and non-state actors in creating challenges to internal security.
- **Ethics (GS Paper IV):** Ethical dilemmas in international relations; The morality of nuclear deterrence.