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FOR UPSC CIVIL SERVICE EXAMINATION

DATE: 06/07/2026 (MONDAY)



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VIDHVATH IAS ACADEMY



1. Direct-Seeded Rice (DSR): A Sustainable Alternative to Traditional Paddy Cultivation

Key Highlights & Summary

- **Shifting Agri-Paradigms:** Amidst erratic monsoons and El Niño phenomena, Direct-Seeded Rice (DSR) is gaining rapid traction among basmati and non-basmati paddy farmers as a resilient alternative to traditional transplanting.
- **The Transplanting Challenge:** Traditional paddy cultivation relies on "puddling" (flooding fields and repeated tilling), which is highly water-intensive and labor-consuming, requiring extensive nursery rearing and transplantation.
- **Massive Water Footprint:** Puddling alone consumes water equivalent to three irrigations. Traditional fields require continuous irrigation every second day for the first three weeks to maintain a standing water depth of 4-5cm.
- **Resource Strain:** Depending on crop duration (e.g., 115-120 days for Pusa Basmati-1509), a traditional field needs 20 to 30 irrigations, with each irrigation consuming over 200,000 litres of water per acre.
- **Economic & Environmental Relief:** DSR bypasses the nursery and puddling stages, sowing seeds directly into the field via mechanization, thereby significantly reducing methane emissions, labor costs, and overall water usage.



Essential Definitions

- **Puddling:** The mechanical churning of water-logged soil to break down soil clods, plug macropores, and create a soft, impermeable seedbed that retains standing water.
- **Direct-Seeded Rice (DSR):** A method of rice cultivation where seeds are sown directly into the main field, eliminating the resource-heavy transplantation phase.

Legal and Constitutional Framework

- **Seventh Schedule:** Agriculture (Entry 14) and Water (Entry 17) fall under the State List, making state-level policy incentives crucial for adopting water-saving technologies like DSR.
- **Article 48 (DPSP):** Directs the State to organize agriculture on modern and scientific lines, which aligns with promoting resource-efficient techniques like DSR.
- **Environmental Mandate:** Article 48A and Article 51A(g) emphasize safeguarding the environment, relevant here given DSR's potential to curb groundwater depletion and reduce agricultural greenhouse gases.

Conclusion & UPSC Relevance

UPSC Relevance: GS Paper III (Major crops, cropping patterns, irrigation systems, land reforms, and agricultural technology). **Conclusion:** As climate volatility intensifies, transitioning from water-guzzling puddling methods to Direct-Seeded Rice is no longer just an option but an ecological necessity. Scaling up DSR requires robust policy support, localized mechanization, and targeted power/water subsidy restructuring to ensure sustainable food security.



2. INS Sudarshini Participates in US Independence Celebrations

- **Historic Participation:** Indian Navy's sail training ship, INS *Sudarshini*, participated in the International Naval Review and Sail 4th 250 celebrations on the Hudson River in New York to mark the 250th anniversary of United States independence.
- **Geopolitical Significance:** The vessel's presence highlights the "enduring friendship, mutual respect, and expanding maritime partnership" between India and the United States amid evolving Indo-Pacific dynamics.
- **Transoceanic Mission:** The port call in New York is a key milestone of the ship's ongoing 10-month-long transoceanic expedition, named *Lokayan 2026*, aimed at fostering global maritime bridges.
- **Symbol of Soft Power:** Flying the Indian tricolour past iconic landmarks like the Statue of Liberty serves as a potent exercise in naval diplomacy and projection of India's maritime heritage.
- **Interoperability and Bonding:** The grand event brought together naval and sail vessels from the US and multiple partner nations, enhancing person-to-person ties and cooperative training frameworks among seafaring nations.



Essential Definitions

- **Sail Training Ship:** A specialized vessel used by navies to train officers and cadets in foundational seamanship, navigation, and endurance under sail, fostering leadership and team spirit.
- **Naval Diplomacy:** The use of naval forces to achieve diplomatic objectives, project soft power, and build cooperative international relationships through port visits, joint exercises, and ceremonial events.
- **Transoceanic Expedition:** A long-distance maritime voyage across major oceans designed to test endurance, undertake training, and carry out strategic diplomatic engagements globally.

Legal and Constitutional Framework

- **Article 51 of the Indian Constitution:** Under the Directive Principles of State Policy (DPSP), Article 51 directs the State to promote international peace and security, maintain just and honorable relations between nations, and foster respect for international law and treaty obligations.
- **United Nations Convention on the Law of the Sea (UNCLOS):** India and the US actively cooperate to ensure freedom of navigation, overflight, and unimpeded commerce in international waters, aligning with rules-based maritime order principles.
- **Bilateral Defense Architecture:** This deployment strengthens the foundational defense agreements signed between India and the US (such as LEMOA and COMCASA) by enhancing operational familiarity and strategic alignment.

Conclusion

The participation of INS *Sudarshini* in the 250th American independence celebrations transcends a simple ceremonial visit. It underscores India's growing role as a responsible maritime stakeholder committed to global partnerships. By blending traditional seamanship with modern naval diplomacy



through the *Lokayan 2026* expedition, India effectively projects its maritime soft power while solidifying its strategic convergence with the United States.

UPSC Relevance

- **Syllabus Linkage:** 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) and GS Paper III (Security challenges and their management).

3. Rice-to-Ethanol Policy: Economic and Environmental Stress

- **Overproduction and Stockpiling:** India produced 154 million metric tonnes (MMT) of rice in 2025-26, becoming the world's largest producer. The Food Corporation of India (FCI) holds buffer stocks nearly five times the required norm, incurring massive carrying costs (\$Rs 10,712\$ crore in FY25).
- **Subsidized Diversion Dilemma:** To deplete overflowing grain stocks, the government diverts rice to ethanol production. However, FCI's economic cost for rice is \$Rs 44\$/kg while it is sold to ethanol plants at a subsidized rate of roughly \$Rs 23\$/kg, triggering a "food-versus-fuel" debate and major fiscal distortions.
- **Distorted Incentive Architecture:** Open-ended procurement at Minimum Support Price (MSP), combined with competitive state-level bonuses and free electricity/water, drives chronic over-cultivation of rice, which is highly water-intensive.
- **Severe Environmental Degradation:** Producing one kilogram of rice requires roughly 4,000 litres of irrigation water. Flooded rice fields emit substantial methane, while heavily subsidized urea application (with 85-90% of the cost absorbed by the government) causes high nitrous oxide emissions and groundwater nitrate contamination.
- **Health and Ecological Hazards:** The resulting environmental stress has directly led to groundwater depletion, soil degradation, and severe public health concerns like blue baby syndrome, thyroid disorders, and increased cancer risks due to nitrate leaching.
- **Policy Rationalization Needed:** Experts argue that while a 20% ethanol blending mandate is sound, mandating ethanol producers to source a fixed feedstock share from FCI rice is counterproductive. Policy must shift toward alternative feedstocks like maize and direct cash transfers to rationalise resource use.



Essential Definitions

- **Food-vs-Fuel Debate:** The socio-economic conflict arising from the diversion of arable land or food crops (like corn, sugarcane, or rice) for biofuel production, potentially compromising food security and inflating grain prices.
- **Carrying Cost:** The total financial expense incurred by public agencies like the FCI to store, manage, insure, and maintain surplus food grain buffer stocks over a specific period.
- **Blue Baby Syndrome (Methaemoglobinaemia):** A serious blood disorder, primarily affecting infants, caused by high nitrate contamination in drinking water (often due to excessive fertilizer runoff), which reduces the blood's capacity to carry oxygen.



Legal and Constitutional Framework

- **Article 47 of the Indian Constitution:** A Directive Principle directing the State to raise the level of nutrition and the standard of living of its people, and to improve public health, which is directly impacted by agricultural pollution.
- **Article 48A of the Indian Constitution:** Mandates the State to protect and improve the environment and to safeguard the forests and wildlife of the country, highlighting the need to curb soil and water degradation.
- **National Food Security Act (NFSA), 2013:** Provides a legal entitlement to subsidized food grains to nearly 800 million people under the Public Distribution System (PDS), forming the core legislative baseline for India's food procurement policies.

Conclusion

While India's transition from food scarcity to the world's leading rice exporter is a historic milestone, current subsidy structures have created an unsustainable surplus trap. Diverting subsidized food grains to ethanol plants provides a short-term outlet for overflowing stocks but fails to address root ecological and fiscal distortions. Transitioning to market-decontrolled fertilizer pricing, promoting water-saving direct-seeded rice, and utilizing non-food feedstocks like maize are vital steps to ensure long-term agricultural sustainability.

UPSC Relevance

- **Syllabus Linkage:** GS Paper III (Major crops, cropping patterns, technology missions, economics of animal-rearing; Issues related to direct and indirect farm subsidies and MSP; PDS objectives, functioning, limitations, revamping; Biofuels).
- **Prelims Focus:** Ethanol Blending Programme (EBP) targets, feedstocks authorized for biofuel generation, methane and nitrous oxide dynamics in agriculture, and conditions causing blue baby syndrome.

4. Role of Panchayats in Localized Climate Action Planning

- **Rising Climate Vulnerability:** With 97 Indian cities featuring among the top 100 hottest globally in May—with temperatures in regions like Bundelkhand and Varanasi hovering around 47-48°C—climate change is heavily disrupting rural livelihoods and shifting monsoon patterns.
- **Marginalization of Local Bodies:** Despite bearing the direct brunt of climate anomalies, Gram Panchayats remain at the periphery of mainstream climate mitigation and adaptation planning frameworks.
- **The Devolution Gap:** Although the 73rd Constitutional Amendment identified 29 subjects for local devolution, the Panchayat Advancement Index 2.0 (PAI) and Panchayat Devolution Index indicate a decline in functional devolution and actual planning autonomy.
- **Fiscal vs. Functional Powers:** While the 16th Finance Commission has pioneeringly integrated climate factors into its fiscal devolution recommendations, local bodies lack the corresponding procedural authority to effectively plan, rather than just spend.
- **Success of Grassroots Models:** Local initiatives like watershed management in Hiware Bazar (Maharashtra), ecological restoration using District Mineral Foundation funds in Bokaro (Jharkhand), and coastal weather-risk management in Kerala demonstrate the high impact of localized solutions.



- **Strategic Triad for Integration:** To make climate targets impactful, the National Action Plan on Climate Change (NAPCC) must formalize Panchayats as core planning partners, leverage PAI's thematic areas for lateral learning, and pair fiscal transfers with robust local execution authority.

Essential Definitions

- **Functional Devolution:** The actual transfer of decision-making powers, responsibilities, resources, and administrative control from central or state governments to local self-governing bodies.
- **Panchayat Advancement Index (PAI):** A comprehensive framework used to evaluate, score, and rank the performance of Panchayats across various thematic socio-economic and governance indicators to measure localization progress.
- **Carbon Sink:** A natural or artificial reservoir (such as forests, oceans, or soil) that absorbs and stores more carbon dioxide from the atmosphere than it releases, thereby offsetting greenhouse gas emissions.



Legal and Constitutional Framework

- **73rd Constitutional Amendment Act, 1992:** Inserted Part IX and the Eleventh Schedule into the Constitution, defining 29 distinct subjects—including agriculture, water management, and social forestry—intended for devolution to Panchayats.
- **Article 243G of the Indian Constitution:** Empowers state legislatures to endow Panchayats with the necessary powers and authority to function as institutions of local self-government, specifically for preparing plans for economic development and social justice.
- **Article 48A (Directive Principles):** Instructs the State to protect and improve the environment, providing a constitutional basis that can be advanced effectively by empowering grassroots local administrations.

Conclusion

India's ambitious Nationally Determined Contributions (NDCs) require a solid, bottom-up foundation to succeed. Top-down climate frameworks cannot address the hyper-local variations of water scarcity and heat stress. Transforming Gram Panchayats from mere spending channels into active planning partners—supported by institutional finance and functional autonomy—is essential to build a climate-resilient rural India.

UPSC Relevance

- **Syllabus Linkage:** GS Paper II (Functions and responsibilities of the Union and the States, issues and challenges pertaining to the federal structure, devolution of powers and finances up to local levels and challenges therein) and GS Paper III (Conservation, environmental pollution and degradation).
- **Prelims Focus:** 11th Schedule subjects, 16th Finance Commission devolution criteria, Panchayat Advancement Index (PAI), and updated Paris Agreement NDC targets (such as reducing emissions intensity by 47% from 2005 levels by 2035).



5. AI Reshaping Warfare: How India Can Keep Pace

- **The New Trinity of Combat:** Modern warfighting and strategic deterrence are being fundamentally redefined by the integration of Artificial Intelligence (AI), military autonomy, and algorithmic precision, driving an exponential rise in battlefield lethality.
- **Global Theatres of Algorithmic Warfare:** Real-world applications have already shifted from concept to combat, highlighted by Ukraine's AI-driven *DELTA* battlefield data analytics platform, the US deploying autonomous unmanned fighter jets like the *YFQ-44A Fury*, and software-driven intelligence platform usage in high-stakes operations across Venezuela and Iran.
- **The Paradigm Shift to Software-Enterprise:** Breakthroughs in software innovations are occurring every three weeks compared to hardware timelines of three months. Traditional military complexes must shift from a platform-and-weapons factory approach to a highly agile software enterprise model to achieve "combat overmatch."
- **Asymmetric and High-Tech Threats:** Adversaries are rapidly advancing in offensive cyber capacities—such as the *Mythos* virtual cyber-nuke capable of disabling operating systems—and scaling hardware density, with major regional powers processing data and executing algorithmic targeting at machine speed.
- **Strategic Roadmap for India:** To maintain strategic deterrence against Pakistan and China, India must urgently field autonomous drone swarms (targeting 5 million drones by 2028), establish AI-driven "kill webs" along the Line of Control (LoC) and Line of Actual Control (LAAC), and heavily crowd Low-Earth Orbit (LEO) space with persistent surveillance arrays.
- **Fiscal Pivot for Modernization:** Bridging the gap requires an immediate cultural and structural overhaul. India's 2027 defense budget must structurally reflect this paradigm by allocating at least 40% of its \$Rs 2\$ lakh-odd crore modernization budget exclusively toward software and AI-driven tech solutions.



Essential Definitions

- **Algorithmic Warfare:** The strategic application of artificial intelligence, machine learning algorithms, and big data analytics to automate command decisions, speed up target identification, and orchestrate real-time combat maneuvers.
- **Digital Kill Web:** A network-centric warfare model where distributed sensors, AI processors, and autonomous weapons cross-communicate instantaneously to detect, track, and neutralize targets within fractions of a minute.
- **Asymmetric Deterrence:** A security strategy where a nation utilizes localized, cost-effective high-technology innovations (like drone swarms and cyber capabilities) to counter or neutralize an adversary's massive conventional military and hardware superiority.

Legal and Constitutional Framework

- **Article 51(c) of the Indian Constitution:** Mandates the State to foster respect for international law and treaty obligations, which increasingly encompasses the evolving global norms governing the deployment of Lethal Autonomous Weapon Systems (LAWS).



- **The Principle of Military Necessity under International Humanitarian Law (IHL):** Regulates the integration of algorithmic targeting, ensuring that AI-driven weapon operations comply with the core Geneva Convention tenets of distinction, proportionality, and precaution.
- **Union List (Seventh Schedule) - Entry 1 & Entry 2:** Grants the Parliament exclusive legislative jurisdiction over the Defense of India and the Armed Forces, providing the solid constitutional backing required to enact sweeping structural and fiscal modernizations.

Conclusion

The strategic military landscape has permanently shifted from a race for hardware dominance to a race for software and algorithmic supremacy. For India, building localized AI architectures, securing Low-Earth Orbit, and restructuring defense procurement away from slow-moving physical platforms toward high-speed software development are no longer optional. Only by committing substantial fiscal resources to autonomous technologies can India avoid preparing for past conflicts and effectively secure its borders against next-generation threats.

UPSC Relevance

- **Syllabus Linkage:** GS Paper III (Security challenges and their management in border areas; Linkages of organized crime with terrorism; Science and Technology-developments and their applications and effects in everyday life; Indigenization of technology).
- **Prelims Focus:** AI platforms in conflict zones (e.g., DELTA), specifications of indigenous drone defense frameworks, low-earth orbit (LEO) surveillance dynamics, and defense procurement policy mandates.

6. Strict Public Safety and Property Damage Laws in West Bengal

- **Sweeping Legislative Enactments:** The West Bengal Assembly passed two major law enforcement bills: the West Bengal Public Safety and Control of Anti-Social Activities Bill, 2026, and the West Bengal Maintenance of Public Order (Amendment) Bill, 2026, marking a significant structural shift in the state's internal security architecture.
- **Stringent Preventive Detention:** The Public Safety Bill empowers District Magistrates and Police Commissioners to order preventive detention for up to 12 months without trial for individuals classified as habitual offenders ("goondas") or those deemed desperate and dangerous to public safety.
- **Strict Judicial Review and Restrictions:** While an Advisory Board led by a serving or retired High Court judge must review detentions within three weeks, Section 10(4) of the Bill explicitly restricts detainees from being routinely represented by legal practitioners before the board, sparking intense civil liberty debates.
- **Strict Liability for Vandalism:** The Public Order Amendment establishes an aggressive property recovery mechanism targeting riots, arson, and protests. A statutory Claims Commission with civil court powers will assess damages and can recover up to three times the cost of destroyed assets.
- **Expansive Liability and Asset Auction:** Financial liability under the new recovery framework extends past actual perpetrators to encompass protest organizers, instigators, and financial backers. Unpaid damages will be extracted directly through the attachment and public auction of personal property as arrears of land revenue.



- **Adoption of Tough Governance Templates:** These legislative frameworks mirror the stringent anti-vandalism and preventive detention laws enforced in states like Uttar Pradesh and Gujarat, aiming to suppress organized crime while drawing sharp scrutiny over executive overreach.

Essential Definitions

- **Preventive Detention:** The pre-emptive confinement of a person by executive order without a formal trial or judicial conviction, based entirely on the administrative anticipation that they may commit acts prejudicial to public order or state security.
- **Strict Liability:** A legal doctrine that holds an individual or entity legally responsible for the damage or consequences of their actions or associations, regardless of active fault, criminal intent, or direct physical participation in the offense.
- **Externment:** An administrative enforcement measure that legally expels a designated habitual offender from a specified geographical area or district for a set period to prevent repeat disturbances.

Legal and Constitutional Framework

- **Article 22 of the Indian Constitution:** Provides essential safeguards against arrest and detention. While Clause 4 permits preventive detention laws, it mandates that an Advisory Board must review any extension of detention past three months, unless Parliament specifies otherwise.
- **Seventh Schedule (Article 246):** Places "Public Order" under Entry 1 and "Police" under Entry 2 of the State List (List II), granting state legislatures the exclusive constitutional authority to enact specialized penal and public safety laws.
- **The Principle of Natural Justice:** A core constitutional doctrine under Article 14 and Article 21 ensuring fair administrative procedures. Restrictions on legal counsel before statutory review boards face rigorous judicial testing against these fundamental rights.

Conclusion

The enactment of these stringent laws highlights a growing regional preference for hardline legislative measures to curb public disorder and organized crime. By institutionalizing 12-month preventive detentions and enabling the state to seize, attach, and auction the personal assets of protest organizers, West Bengal has significantly reinforced executive enforcement power. Balancing this expanded authority with constitutional protections against arbitrary detention and procedural fairness remains a critical challenge for the judiciary.

UPSC Relevance

- **Syllabus Linkage:** GS Paper II (Statutory, regulatory and various quasi-judicial bodies; Government policies and interventions for development in various sectors and issues arising out of their design and implementation; Fundamental Rights and Judicial Review).
- **Prelims Focus:** Constitutional provisions governing preventive detention (Article 22), the composition and timelines of state Advisory Boards, Seventh Schedule list divisions, and the operational scope of state-level Claims Commissions.

7. OPEC+ Production Hike: Easing Global Energy Crisis and Evolving Market Dynamics

- **Phased Rollback of Output Cuts:** Seven core members of the OPEC+ alliance—Saudi Arabia, Russia, Iraq, Kuwait, Kazakhstan, Algeria, and Oman—have agreed to raise collective oil production quotas by 188,000 barrels per day (bpd) from August 2026, marking the fifth consecutive monthly increase.



- **Geopolitical De-escalation:** This gradual unwinding of the voluntary 2023 supply curbs follows a diplomatic breakthrough via a memorandum of understanding between the US and Iran, which effectively lifted the naval blockade of Iranian ports and initiated a recovery of commercial traffic in the crucial Strait of Hormuz.
- **Price Correction Mechanics:** Following a severe wartime energy crisis that pushed Brent crude oil prices briefly above \$120 per barrel in early 2026, the combination of rising production quotas and a diplomatic thaw has successfully cooled the market down to pre-war baselines of approximately \$72 per barrel.
- **Structural Easing of Storage Gluts:** The effective closure of the Strait of Hormuz had previously forced Gulf states to drastically cut physical output due to localized storage capacity exhaustion; the reopening of maritime choke points allows producers to liquidate backed-up supplies.
- **Cautionary Flexibility Framework:** Despite the announced increases, the alliance maintains strict conditional oversight, reserving full tactical authority to pause, adjust, or completely reverse output rollbacks during regular monthly review cycles depending on Chinese demand recovery and global macroeconomic conditions.
- **Alliance Realignment:** This production schedule represents a recalibrated baseline for the alliance following the structural exit of the United Arab Emirates (UAE) from the OPEC+ framework on May 1, 2026, to independently align domestic capacity with its own export policies.



Essential Definitions

- **OPEC+:** A loose diplomatic and economic alliance formed in 2016 between the 13 core members of the Organization of the Petroleum Exporting Countries (OPEC) and 10 major non-OPEC oil-exporting nations (led by Russia) to collectively regulate global crude supply and stabilize pricing.
- **Strait of Hormuz:** A highly critical maritime choke point connecting the Persian Gulf with the Gulf of Oman and the Arabian Sea, through which approximately one-fifth of the world's total petroleum and liquefied natural gas (LNG) consumption passes.

Legal and Constitutional Framework

- **Declaration of Cooperation (DoC):** The foundational global framework governing OPEC+ coordination, establishing a multilateral compliance and monitoring architecture via the Joint Ministerial Monitoring Committee (JMMC) to manage overproduction compensation parameters.
- **Strategic Petroleum Reserves (SPR) Mandates:** Domestic legal frameworks across major consuming nations (like India's ISPR under the Ministry of Petroleum and Natural Gas) that govern the emergency release or replenishment of crude stocks to protect national energy security against external trade supply shocks.

Conclusion

The latest OPEC+ decision to incrementally boost output signals a transition away from the high-inflation wartime conditions that characterized early 2026. While the reopening of the Strait of Hormuz resolves immediate distribution gridlocks, the underlying fragmentation within the cartel—exemplified by the UAE's exit—and a fragile global demand outlook mean that market stability remains highly volatile, requiring energy-importing nations to maintain strong macroeconomic vigilance.



UPSC Relevance

- **Syllabus Linkage:** GS Paper II (Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests) and GS Paper III (Infrastructure: Energy; Indian Economy and issues relating to planning, mobilization of resources, growth, development).
- **Prelims Focus:** Cartel composition of OPEC vs. OPEC+, geographical limits and border states of the Strait of Hormuz, and the institutional structure of the Joint Ministerial Monitoring Committee.

8. Passport and the Shifting Paradigms of Indian Citizenship

- **The Passport Controversy:** A Ministry of External Affairs (MEA) statement asserting that an Indian passport is merely a "travel document" rather than a "citizenship document" has sparked intense debate over what constitutes conclusive proof of citizenship in India.
- **Constitutional Intent and Secular Foundations:** During the Constituent Assembly debates, proposals to base citizenship on religious identity (such as those moved by P.S. Deshmukh) were explicitly rejected by leaders like Jawaharlal Nehru and Alladi Krishnaswami Ayyar, establishing a neutral, secular foundation for Indian identity.
- **Shift from Jus Soli to Jus Sanguinis:** India's citizenship framework has progressively shifted from the principle of *jus soli* (citizenship by birth and residence) toward *jus sanguinis* (citizenship based on descent), accelerated by statutory amendments in 1985, 2003, and 2019 that tightened eligibility and introduced exclusions.
- **Judicial Directives and the Burden of Proof:** Recent Supreme Court rulings, including the validation of the Election Commission of India's (ECI) Special Intensive Revision (SIR) of electoral rolls, have expanded executive scrutiny, shifting the onus onto residents to continuously prove their status.
- **The Crisis of Document Inadequacy:** Bureaucratic interpretations have increasingly created an evidentiary vacuum where standard official documents are deemed limited—with certain cards proving only residence, voter IDs proving prior registration, and passports restricted to travel rights.
- **Personhood Versus Paperwork:** Legal scholars argue that reducing citizenship to a continuously contested administrative process undermines basic human dignity, effectively threatening the "right to have rights" and compromising core democratic principles.



Essential Definitions

- **Jus Soli:** A legal principle by which nationality or citizenship is determined by an individual's place of birth, irrespective of the citizenship or ethnicity of their parents.
- **Jus Sanguinis:** A rule of law providing that a person's citizenship is determined by the nationality of one or both parents, rather than by their place of birth.
- **Right to Have Rights:** A political concept formulated by philosopher Hannah Arendt emphasizing that basic human protections require belonging to a structured political community that guarantees individual legal status.



Legal and Constitutional Framework

- **Part II of the Indian Constitution (Articles 5-11):** Establishes the constitutional baseline for citizenship, dealing with parameters at the commencement of the republic and addressing the realities of Partition.
- **Article 11 of the Indian Constitution:** Grants plenary power to Parliament to regulate the acquisition and termination of citizenship, subject to the basic structure of the Constitution, including secularism and equality.
- **The Citizenship Act, 1955:** The primary legislative text governing Indian citizenship, which has undergone extensive revisions (including the 1985 Assam Accord integration, the 2003 illegal migrant amendments, and the 2019 provisions).

Conclusion

The debate over whether a passport serves as definitive proof of nationality highlights a deeper structural crisis within India's citizenship architecture. As regulatory mechanisms shift the burden of proof onto the individual, standard official documentation is increasingly treated as insufficient. In a constitutional democracy, rights must be anchored in the principles of equal dignity and personhood rather than the hazards of shifting administrative paperwork.

UPSC Relevance

- **Syllabus Linkage:** GS Paper II (Indian Constitution—historical underpinnings, evolution, features, amendments, significant provisions and basic structure; Government policies and interventions for development in various sectors).
- **Prelims Focus:** Articles 5 to 11 of the Constitution, the Passports Act, 1967, statutory changes in the Citizenship Act, 1955, and the specific functions of Foreigners Tribunals and the ECI.

9. Hormuz to Home: India's Strategic Resilience in Uncertain Times

- **Vulnerability to External Shocks:** India relies on imports for nearly 90% of its crude oil requirements and 65% of its liquefied natural gas (LNG), making its macroeconomic stability highly susceptible to disruptions in major maritime choke points.
- **The Strait of Hormuz Disruption:** The recent West Asia conflict, marked by military strikes and counter-strikes, caused suppliers to invoke force majeure clauses, temporarily interrupting traffic through the Strait of Hormuz—a crucial artery handling 1/5th of global oil consumption.
- **Proactive Security Interventions:** Through coordinated institutional mechanisms, the Indian government maintained continuous communication with maritime authorities and international partners, executing decisive interventions to protect Indian-flagged vessels and commercial seafarers.
- **Whole-of-Government Energy Strategy:** To counter supply constraints, the government invoked emergency powers under the Essential Commodities Act, calibrating natural gas allocation to prioritize fertilizer plants and City Gas Distribution networks while cutting supplies to non-priority sectors.
- **Macroeconomic and Fiscal Buffer:** Despite Brent crude surging toward \$119 per barrel, the government neutralized domestic inflationary pressures by slashing fuel excise duties by ₹10 per litre and encouraging supply diversification, allowing merchandise exports to grow by 16% in April-May FY27.



- **Monetary and Regulatory Support:** The Reserve Bank of India (RBI) complemented fiscal measures by stabilizing external flows through forex swap facilities, implementing schemes to raise foreign currency deposits from non-resident Indians, and rationalizing taxes for foreign portfolio investors.

Essential Definitions

- **Force Majeure:** A standard contractual provision that frees parties from obligation or liability when an extraordinary, unforeseeable event beyond their control (such as war, strikes, or natural disasters) prevents them from fulfilling commitments.
- **City Gas Distribution (CGD) Network:** An interconnected network of pipelines designed to supply cleaner, compressed natural gas (CNG) and piped natural gas (PNG) to domestic, commercial, and transport segments within a specified geographical area.
- **Forex Swap Facility:** A monetary policy tool used by central banks to exchange domestic currency for foreign currency (or vice versa) with commercial banks for a predefined duration to manage systemic liquidity and stabilize exchange rates.

Legal and Constitutional Framework

- **The Essential Commodities Act, 1955:** Provides the statutory architecture enabling the central government to regulate the production, supply, and distribution of critical commodities—such as petroleum and natural gas—during emergency supply disruptions.
- **Article 297 of the Indian Constitution:** Vests all lands, minerals, and other things of value underlying the ocean within the territorial waters, continental shelf, or exclusive economic zone (EEZ) of India in the Union, underscoring central sovereignty over resource management.
- **Union List (Seventh Schedule) - Entry 25 & Entry 53:** Grants the Parliament exclusive legislative authority over maritime shipping and navigation, as well as the regulation and development of oilfields, mineral oil resources, petroleum, and petroleum products.

Conclusion

The successful management of the Strait of Hormuz crisis highlights India's transition from passive emergency reaction to institutionalized resilience. By combining targeted legal interventions under the Essential Commodities Act with strategic energy diversification and astute monetary stabilizing tools, India effectively decoupled its domestic economy from severe external supply shocks. Sustained long-term investments in strategic storage, domestic gas grid expansions, and robust financial buffers will remain critical to securing macroeconomic growth on the path toward Viksit Bharat.

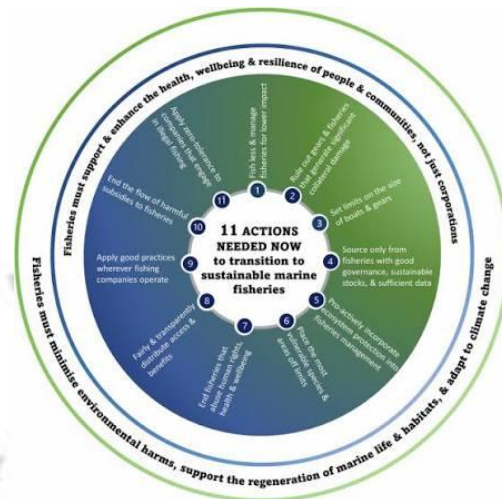
UPSC Relevance

- **Syllabus Linkage:** GS Paper II (Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests) and GS Paper III (Indian Economy and issues relating to planning, mobilization of resources, growth, development; Infrastructure: Energy).
- **Prelims Focus:** Geographical positioning and bordering states of the Strait of Hormuz, statutory triggers under the Essential Commodities Act, and RBI instruments like forex swap facilities.



10. Sustainability vs Degradation: The Crisis in India's Marine Fisheries

- **Divergent Sustainability Assessments:** The Government of India, citing Central Marine Fisheries Research Institute (CMFRI) data, claimed 91.1% of 135 evaluated fish stocks are sustainable. Conversely, the Food and Agriculture Organization (FAO) reports that Indian marine production has plateaued, with major stocks fully exploited.
- **Methodological Vulnerabilities:** Unlike advanced fishing nations that utilize direct, at-sea physical stock assessments, India's evaluation relies primarily on "landing data" (actual catch volumes), which can mask underlying ecological depletion.
- **Inshore Benthic Destruction:** The crucial inshore ecological zone—largely overlapping with the 12 nautical mile territorial sea limit and narrow continental shelf—is facing severe benthic degradation driven by river damming, mangrove destruction, and unregulated industrial runoff.
- **Unregulated Trawl Expansion:** The adoption of semi-industrial mechanised trawling has scaled to 64,414 vessels. The fleet continuously operates within the prohibited 5 nautical mile artisanal fishing zone due to severe deficits in state patrolling infrastructure.
- **Livelihood Displacement and Conflict:** The collapse of the inshore ecosystem forces both small-scale and mechanised fishers into expensive offshore waters. This driven overcapacity fuels international maritime friction, exemplified by the Palk Bay conflict with Sri Lanka.



Essential Definitions

- **Benthic Environment:** The lowest ecological zone of a body of water, including the sediment surface and sub-surface layers, which serves as a critical breeding and feeding habitat for marine organisms.
- **Exclusive Economic Zone (EEZ):** A maritime zone prescribed by international law extending up to 200 nautical miles from a nation's coast, over which the sovereign state has exclusive exploratory and resource management rights.
- **Landing Data:** Statistical records of the weight and species composition of marine catches discharged at ports, used indirectly to model ecosystem health in the absence of direct biomass assessments.

Legal and Constitutional Framework

- **Seventh Schedule (Article 246):** Divides fisheries jurisdiction, placing "Fisheries beyond territorial waters" under Entry 57 of the Union List (List I), and "Fisheries" within territorial waters under Entry 21 of the State List (List II).
- **Maritime Zones Act, 1976:** Provides the domestic statutory baseline defining India's legal rights, jurisdiction, and boundaries over its Territorial Waters (12 nautical miles), Contiguous Zone, and EEZ (200 nautical miles).
- **Article 48A of the Indian Constitution:** Directs the State to protect and improve the environment and safeguard public natural resources, providing a constitutional anchor for marine conservation and sustainable resource extraction.



Conclusion

The dichotomy between official statistical optimism and grassroots ecological degradation highlights an urgent governance gap in India's marine sector. Relying on landing data risks misinterpreting fleet overcapacity as resource abundance while the vital inshore benthic environment collapses. Transitioning from extraction-driven policies to decentralized, co-managed coastal monitoring, alongside strict enforcement of trawler boundaries, is essential to secure long-term maritime ecology and protect small-scale fishing livelihoods.

UPSC Relevance

- **Syllabus Linkage:** GS Paper III (Economics of animal-rearing; Technology missions; Conservation, environmental pollution and degradation) and GS Paper II (Government policies and interventions for development in various sectors).
- **Prelims Focus:** Mandate of CMFRI, UNCLOS maritime boundaries (Territorial waters vs EEZ), Seventh Schedule jurisdictional distribution of fisheries, and geographic limits of the Palk Bay.

11. ISRO Successfully Validates SOLVE Platform for Gaganyaan Mission

- **Successful Ground Test Firing:** The Indian Space Research Organisation (ISRO) successfully conducted the first ground static test of the solid motor for its new Sub-Orbital Launch Vehicle for Experiments (SOLVE) at the Satish Dhawan Space Centre, Sriharikota.
- **Purpose of the SOLVE Platform:** SOLVE is designed as a dedicated, cost-effective test vehicle to carry out Integrated Parachute Tests, validating the performance and sequencing of the Gaganyaan crew module's complex deceleration and recovery systems.
- **Simulated Recovery Flight Profile:** During planned operational test flights, the SOLVE platform will loft the crew module to altitudes between 10 km and 17 km before separation, initiating a highly choreographed deployment sequence of 10 parachutes to slow the craft ahead of a safe ocean splashdown.
- **Structural Lineage and Modifications:** Derived from the reliable Polar Satellite Launch Vehicle (PSLV) solid strap-on motor, the SOLVE propulsion stage has been heavily modified with a slow burn-rate propellant, a straight nozzle configuration, and secondary injection thrust vector control for precise atmospheric steering.
- **Ancillary Mission Milestones:** This propulsion milestone follows close on the heels of other critical phase trials, including the second Integrated Air Drop Test (IADT-02) and Mission MITRA, a week-long high-altitude psychological and behavioral assessment conducted for selected astronauts in Leh.



Essential Definitions

- **Sub-Orbital Flight:** A spaceflight trajectory where the launch vehicle or spacecraft reaches space or high atmospheric limits but its velocity remains insufficient to enter a sustained orbital path, resulting in a ballistic return to the surface.



- **Thrust Vector Control (TVC):** The technological ability of an aircraft or launch vehicle's propulsion system to manipulate the direction of its thrust to effectively control the attitude, angular velocity, and flight trajectory of the vehicle.
- **Deceleration System:** A multi-tiered safety assembly, typically using aerodynamic drag devices like drogue and main parachutes, designed to radically decrease the terminal velocity of a re-entering spacecraft to ensure structural survival during touchdown.

Legal and Constitutional Framework

- **Article 51A(h) of the Indian Constitution:** Prescribes a Fundamental Duty for every citizen to develop a scientific temper, humanism, and the spirit of inquiry and reform, which anchors national support for ambitious space exploration initiatives.
- **Space Foreign Direct Investment (FDI) Policy Guidelines:** Executive frameworks updated to allow up to 100% FDI in specific space components, easing technology transfers and encouraging indigenous private industry alignment for subsystem scaling.
- **The Geospatial Data Guidelines, 2021:** Deregulated domestic mapping protocols, providing ISRO and collaborating defense-aerospace entities with seamless high-resolution positional data necessary to map landing coordinates and recover ocean splashdown payloads.

Conclusion

The successful validation of the SOLVE solid motor marks a major milestone in establishing the localized infrastructure required to human-rate India's space systems. By repurposing legacy PSLV hardware into a flexible sub-orbital testing asset, ISRO has streamlined the rigorous qualification protocols required for the atmospheric descent phase. Perfecting these automated parachute dynamics ensures that when crewed flights commence, the recovery architecture will be completely sound.

UPSC Relevance

- **Syllabus Linkage:** 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).
- **Prelims Focus:** Operational details of the Gaganyaan mission, specifications of the SOLVE test vehicle, propellant types (solid vs liquid), and geographic recovery locations in Indian territorial waters.

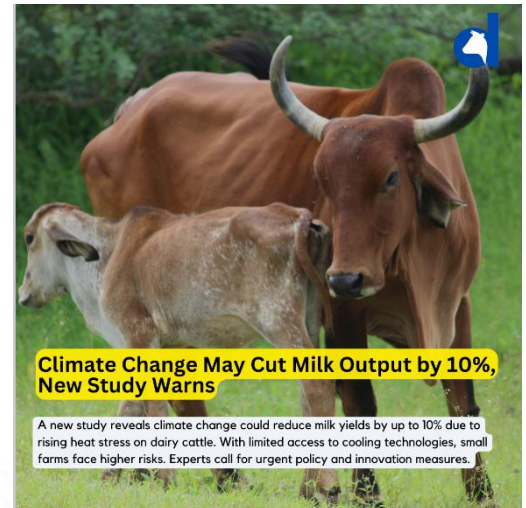
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12. Climate Change and the Decline in Indian Bovine Milk Production

- **Climate-Induced Yield Crisis:** A study published in *Scientific Reports* reveals that global warming acutely undermines dairy production across the Global South, specifically causing a massive drop in bovine milk yields within northwestern India's high-production trans-Gangetic plains.
- **The High-Stress Threshold:** Extreme ambient heat exceeding 38°C combined with relative humidity over 70% during July and August triggers a 20-30% decline in milk production, as lactating animals divert essential metabolic energy away from milk synthesis to regulate core body temperature.
- **Differential Breed Vulnerability:** Due to dark skin pigmentation and fewer sweat glands, buffaloes suffer a yield loss of 1.4 litres per day per unit increase in potential evapotranspiration. Cross-bred cattle also exhibit high vulnerability, whereas indigenous breeds like Sahiwal and Hariana maintain structural heat tolerance.



- **Physiological and Supply System Disruptions:** Elevated Heat-Humidity Indices elevate cortisol and stress hormone levels, impairing milk ejection and increasing mortality. Simultaneously, prolonged summers induce widespread water scarcity, degrade fodder biomass quality, and accelerate pest attacks.
- **Severe Macro-Nutritional and Fiscal Threats:** Climate stressors currently cause an annual loss of 3.2 million tonnes of milk (\$Rs 2,661\$ crore), which is projected to escalate to 15 million tonnes by the 2050s and hit a 25% production drop by 2085, endangering the livelihoods of 80 million smallholder dairy farmers.
- **Resilience and Strategic Mitigation:** While traditional farmers deploy adaptation measures like wallowing ponds, mist-sprinklers, and agroforestry, long-term national policy must prioritize thermo-tolerant breeding programs utilizing *Bos indicus* traits and integrate climate indices into regional agricultural early warning networks.



Essential Definitions

- **Temperature-Humidity Index (THI):** A single value combining ambient temperature and relative humidity used to measure the total heat stress load on livestock and assess its impact on animal physiology and productivity.
- **Potential Evapotranspiration (PET):** The maximum amount of water that would evaporate from the soil and transpire from vegetation if an unlimited water supply were available, serving as a critical metric for regional heat dryness.
- **Homeostasis:** The self-regulating physiological process by which biological systems maintain internal stability and equilibrium while adjusting to changing external environmental conditions.

Legal and Constitutional Framework

- **Article 48 of the Indian Constitution:** A Directive Principle mandating the State to organize agriculture and animal husbandry on modern and scientific lines, specifically preserving and improving livestock breeds and prohibiting the slaughter of cows and calves.
- **National Action Plan on Climate Change (NAPCC):** The foundational executive framework under which the National Mission for Sustainable Agriculture (NMSA) operates to catalyze climate-resilient farming techniques and livestock protection strategies.
- **Rashtriya Gokul Mission:** A statutory central sector scheme aimed at the scientifically modeled development and conservation of indigenous bovine breeds, enhancing milk productivity while preserving crucial thermo-tolerant genetic reservoirs.

Conclusion

The climate-induced drop in milk production across the trans-Gangetic plains marks a critical structural threat to India's status as the world's leading dairy producer. Relying on short-term microclimate adjustments cannot protect vulnerable cross-bred cattle and buffaloes from rising multi-decadal heat stress. Transitioning toward systemic resilience requires integrating real-time weather indices into rural extension models and establishing an institutionalized framework focused on the genetic conservation of heat-tolerant indigenous breeds.



UPSC Relevance

- **Syllabus Linkage:** GS Paper III (Economics of animal-rearing; Major crops and cropping patterns; Technology missions; Conservation, environmental pollution and degradation).
 - **Prelims Focus:** Physiological traits of *Bos indicus* vs. exotic breeds, parameters of the Temperature-Humidity Index (THI), features of the Rashtriya Gokul Mission, and key institutions like the ICAR-National Dairy Research Institute.
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