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THE HINDU
INDIA'S NATIONAL NEWSPAPER SINCE 1878

Daily News Analysis

The Hindu Important News Articles & Editorial For UPSC CSE

Thursday, 01 Dec, 2026

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Page 04 : Prelims Exam

The second edition of the India–UAE Joint Military Exercise, DESERT CYCLONE-II, concluded at Al-Hamra Training City, Abu Dhabi. Conducted from December 18 to 30, the exercise marked another significant milestone in the expanding defence cooperation between India and United Arab Emirates, reinforcing their strategic partnership in the West Asian region.

Second edition of India-UAE military exercise concludes in Abu Dhabi

The Hindu Bureau
NEW DELHI

The exercise DESERT CYCLONE-II concluded with a closing ceremony at Al-Hamra Training City, marking the successful culmination of intensive joint training between the Indian Army and the UAE Land Forces.

Conducted from December 18 to 30 in Abu Dhabi, the second edition of the India-UAE Joint Military Exercise reaffirmed the deepening defence partnership between the two nations and highlighted their shared commitment to regional peace, security and stability.

The exercise featured classroom instruction and field-based training aimed at enhancing interoperability, mutual trust and operational synergy in an urban environment, with emphasis on sub-conventional operations under a United Nations mandate. The troops carried out progressive practical drills in built-up areas, covering room intervention and building clearance, heliborne operations, air assault missions and platoon-level joint assault exercises. Both armies exchanged and rehearsed drills on room intervention and clearance, enabling standardisation of tactics, techniques and procedures.

The Indian contingent comprised 45 personnel, primarily from a battalion of The Mechanised Infantry Regiment, while the UAE Land Forces were represented by the 53 Mechanised Infantry Battalion.

Brothers in arms: The Indian contingent and UAE Land Forces carried out progressive practical drills during the joint training at the Al-Hamra Training City. ADGPI/ANI

Key Highlights

Nature of Exercise: Bilateral joint military exercise between the Indian Army and UAE Land Forces.

Edition: Second edition (DESERT CYCLONE-II).

Location: Abu Dhabi, UAE.

Indian Contingent: 45 personnel, primarily from the Mechanised Infantry Regiment.

UAE Contingent: 53 Mechanised Infantry Battalion of the UAE Land Forces.

Training Environment: Urban and built-up areas.

Operational Focus:

Sub-conventional operations

Missions under a United Nations mandate

Urban warfare scenarios

Operational and Strategic Significance

Interoperability: Joint drills on room intervention, building clearance, heliborne operations, and air-assault missions enhanced operational compatibility between the two forces.

Standardisation of TTPs: Exchange and rehearsal of tactics, techniques, and procedures (TTPs) improved coordination during joint and coalition operations.

Capacity Building: Platoon-level joint assault exercises strengthened small-unit leadership, tactical planning, and execution in complex urban settings.

UN Peacekeeping Context: Emphasis on sub-conventional operations under UN mandates aligns with India's long-standing role in UN peacekeeping missions.

Strategic Context for India

West Asia Engagement: The exercise reflects India's growing defence footprint in the Gulf region, complementing strong economic, energy, and diaspora ties with the UAE.

Defence Diplomacy: Military exercises like DESERT CYCLONE reinforce trust, signal strategic convergence, and contribute to regional stability.

Indo-Pacific and Extended Neighbourhood: Though geographically in West Asia, such partnerships support India's broader vision of cooperative security across its extended neighbourhood.

Conclusion

DESERT CYCLONE-II underscores the maturation of India–UAE defence relations from transactional cooperation to structured military interoperability. For UPSC Prelims, the exercise is important as it highlights India's bilateral military engagements, focus on urban and sub-conventional warfare, and the use of joint exercises as instruments of defence diplomacy aimed at regional peace, security, and stability.

UPSC Prelims Exam Practice Question

Ques: DESERT CYCLONE-II was conducted at which of the following locations?

(a) Jebel Ali Military Base

(b) Al-Dhafra Air Base

(c) Al-Hamra Training City

(d) Zayed Military City

Ans: (c)

Page 06 : GS II : Governance / Prelims Exam

The Union government has pre-published the draft Rules for the four Labour Codes—Code on Wages, Code on Social Security, Industrial Relations Code, and Occupational Safety, Health and Working Conditions Code—inviting public comments within 45 days. This step by the Union Labour Ministry marks a significant move towards operationalising long-pending labour law reforms aimed at rationalising India's complex labour regulatory framework and adapting it to contemporary labour market realities, including gig and platform work.

Centre pre-publishes draft Rules for four Labour Codes

Public has been given 45 days' time to file response; Rules lay down provisions in workplaces where women do night shifts, and social security measures for gig workers; mandate 48-hours work week; defines workers, wages, gratuity, and bonus

A.M. Jigeesh
NEW DELHI

The draft Rules for the four Labour Codes, pre-published on the Union Labour Ministry's website on Tuesday, mandate 48 hours of work per week and lay down the measures to be put in place in workplaces where women work in night shifts. The Rules define workers, wages, types of employment, gratuity, bonus and social security of workers, including gig workers. The public has been given 45 days' time to respond to them.

The Rules for Code on Wages include 18 past Rules such as the Payment of Wages (Procedure) Rules, 1937, the Payment of Wages (Nomination) Rules, 2009, the Minimum Wages (Central) Rules, 1950, the Minimum Wages (Central Advisory Board) Rules, 2011 and the Equal Remuneration Rules, 1976. Under the new draft Rules, the minimum rate of wages will be fixed on criteria of the standard working class family, which includes a spouse and two children apart from the earning em-

The draft Rules say representatives from the unorganised sector will be part of the decision-making on social security measures. PTI

ployee; an equivalent of three adult consumption units; a net intake of 2,700 calories per day per consumption unit; 66 metres of cloth per year; housing rent expenditure to constitute 10% of food and clothing expenditure; fuel, electricity and other miscellaneous items of expenditure to constitute 20% of minimum wage; expenditure for children's education, medical requirement, and recreation; and expenditure on contingencies to constitute 25% of minimum wage. While fixing the minimum rates of wages, the Union government will take into account the geographical area, experience in the

area of employment, and level of skill required for working under the categories of unskilled, semi-skilled, skilled, and highly skilled.

The Rules add that the Central government will constitute a technical committee for advising it on skill categorisation of occupation and so on, headed by the Director-General of Employment, Ministry of Labour and Employment. On fixing floor wage, the Rules have proposed a Central Advisory Board and it will take into account the minimum living standard, including the food, clothing, housing and any other factors considered appropriate by the

Centre from time to time of the standard working class family.

Social security
The Rules for the Code on Social Security supersede 12 prior Rules, including the Employees' State Insurance (Central) Rules, 1950; Employees' Provident Funds Appellate Tribunal (Conditions of Service) Rules, 1997; Payment of Gratuity (Central) Rules, 1972; Building and other Constructions Workers' Welfare Cess Rules and the Unorganised Workers' Social Security Rules.

A National Social Security Board will be constituted with representatives of associations of unorganised sector workers and employers' associations of unorganised sector for the social security measures of unorganised workers. Five members from the gig workers and platform workers, on a rotation basis, representing the different types of gig workers and platform workers will be members of this Board.

They also propose that in every establishment where 50 or more employees are ordinarily em-

ployed, a creche for the use of children under the age of six years of employees is to be provided and maintained.

For night shift of women, the Rules have detailed guidelines to employers such as the consent of woman employee shall be taken in writing, and provision of adequate transportation facilities and closed-circuit television (CCTV) surveillance.

The Rules for Industrial Relations Code comprise the Industrial Disputes (Central) Rules, 1957, and the Industrial Employment (Standing Orders) Central Rules, 1946. They provide the details of trade unions' registration and functioning. They allow secret ballot for the verification of trade unions. The workers are classified as Permanent, Temporary, Apprentices, Probationers, Badlis, Fixed Term Employment and Casual under the Rules. Fixed term employment is defined as the engagement of a worker on the basis of a written contract of employment with the employer for a fixed period.

Key Provisions and Salient Features

Standardisation of Wages and Working Conditions

Mandates a **48-hour work week**, providing uniformity across sectors.

Introduces a scientifically defined **minimum wage formula** based on the concept of a standard working-class family (nutrition, clothing, housing, education, healthcare, and contingencies).

Classification of workers into unskilled, semi-skilled, skilled, and highly skilled categories with a proposed **technical committee** for skill categorisation.

Social Security Expansion

Establishes a **National Social Security Board** with representation from the unorganised sector, including **gig and platform workers**, thereby acknowledging new forms of employment.

Consolidates multiple legacy laws and Rules, aiming for administrative efficiency and wider coverage.

Provision of **crèches** in establishments with 50 or more employees strengthens maternity and childcare support.

Gender-Sensitive Workplace Measures

Detailed safeguards for **women working night shifts**, including written consent, employer-provided transportation, and CCTV surveillance—balancing flexibility with safety.

Industrial Relations Reforms

Streamlines **trade union registration and verification**, including the use of secret ballots.

Clearly defines employment categories such as **fixed-term employment**, which may enhance labour market flexibility while retaining statutory benefits.

Significance for India's Labour Ecosystem

Simplification and Codification: The consolidation of nearly 29 central labour laws into four Codes reduces compliance burden and legal ambiguity.

Formalisation of the Workforce: Clear definitions of wages and workers can aid in bringing informal and gig workers under formal social security nets.

Economic Competitiveness: Predictable labour norms support ease of doing business, potentially boosting investment and employment generation.

Social Justice Dimension: Inclusion of unorganised and gig workers in decision-making bodies reflects an attempt at participatory governance.

Concerns and Challenges

Federal Dimension: Labour is a Concurrent List subject; effective implementation depends on States framing compatible Rules.

Workers' Apprehensions: Trade unions have expressed concerns about dilution of job security and collective bargaining strength, particularly around fixed-term employment.

Administrative Capacity: Extending social security to gig and unorganised workers requires robust digital infrastructure, funding clarity, and enforcement mechanisms.

Consultative Deficit: Critics argue that prior stakeholder consultation has been limited, raising issues of legitimacy and acceptance.

Conclusion

The pre-publication of draft Rules for the four Labour Codes represents a decisive step towards modernising India's labour governance architecture. While the reforms promise simplification, inclusivity, and adaptability to emerging employment forms, their success will hinge on cooperative federalism, meaningful stakeholder engagement, and effective implementation on the ground.

UPSC Prelims Exam Practice Question

Ques: Fixed Term Employment, as defined under the Industrial Relations Code draft Rules, implies:

(a) Employment without entitlement to statutory benefits

(b) Employment through third-party contractors

(c) Employment based on a written contract for a fixed duration

(d) Employment limited to seasonal industries

Ans: c)

UPSC Mains Exam Practice Question

Ques: Evaluate the measures introduced in the draft Labour Code Rules to ensure women's safety and participation in night-shift employment. How far do these measures address structural barriers to women's workforce participation in India? (**150 Words**)

Page 07 : GS III : Indian Economy / Prelims Exam

India recently overtook China to become the world's largest producer and exporter of rice, exporting over 20 million metric tonnes annually. While this achievement strengthens India's position in global food markets and reinforces its food security credentials, it has also exposed a serious structural contradiction in India's agrarian strategy. The rice-led growth model, particularly concentrated in Punjab and Haryana, is increasingly being linked to severe groundwater depletion, raising concerns about long-term ecological sustainability and rural livelihoods.

There is concern that growing rice is draining India's aquifers. GETTY IMAGES/ISTOCKPHOTO

India's status as world's rice leader augurs a water crisis

Reuters

When India overtook China as the world's largest producer of rice this year, the country's politicians and agriculture lobby marked the moment by praising resilient farmers and innovative government policy. India has nearly doubled the amount of rice it exported over the past decade, with shipments crossing 20 million metric tonnes in the latest fiscal year.

But many rice farmers in the country's agricultural heartlands are in a less celebratory mood. There is widespread concern that rice crops are unsustainably draining India's already-low aquifers, forcing farmers to borrow heavily to drill ever-deeper borewells.

In the rice-basket states of Haryana and Punjab, groundwater was reachable at around 30 feet a decade ago, according to 50 farmers and eight water and agriculture officials. But drainage has accelerated in the past five years and borewells must now go between 80 and 200 feet, according to the farmers, whose accounts were corroborated with government data and research by Punjab Agricultural University.

At the same time, government subsidies that incentivise rice cultivation discourage farmers from switching to less water-intensive crops, said Uday Chandra, a South Asia politics expert at Georgetown University in Qatar. The subsidies include a minimum price for rice that has climbed by around 70% over the past decade, as well as heavy power subsidies that encourage extracting water

Key Issues Highlighted

Groundwater Depletion and Aquifer Stress

Rice cultivation is highly water-intensive, requiring **3,000–4,000 litres of water per kilogram**, significantly above the global average.

In Punjab and Haryana, groundwater levels have declined sharply—from around 30 feet a decade ago to 80–200 feet today—forcing farmers to invest in deeper borewells and powerful pumps.

Government data classifies large parts of these States as **"over-exploited" or "critical"**, with groundwater extraction exceeding natural recharge by **35–57%**.

Policy-Induced Distortions

The **Minimum Support Price (MSP)** for rice has increased by around 70% over the past decade, creating strong incentives to continue rice cultivation even in water-scarce regions.

Electricity subsidies for agriculture further encourage excessive groundwater extraction, effectively socialising the environmental costs of rice production.

According to experts from institutions such as the International Food Policy Research Institute, India is paradoxically subsidising the overuse of groundwater in one of the world's most water-stressed countries.

Regional and Climatic Vulnerability

Unlike many other regions that use a mix of surface and groundwater irrigation, Punjab and Haryana rely predominantly on groundwater, making them especially vulnerable to weak monsoons.

Producing a kilogram of rice consumes 3,000-4,000 litres of water. That is between 20-60% more than the global average

for farm use.

The net effect, said Avinash Kishore at the International Food Policy Research Institute think-tank in Washington, is that one of the world's most water-stressed countries is paying farmers to consume vast amounts of groundwater.

India grows far more rice than it needs to feed its domestic population, which overtook China's in 2023 to become the world's largest, at more than 1.4 billion people.

While farmers in much of India rely on a mix of surface and groundwater irrigation, growers in Punjab and Haryana typically depend on groundwater. That dependence makes rice farmers in both states particularly vulnerable to weak monsoons.

Even though monsoon rains have been strong for the last two years, farmers have been extracting so much water that aquifers in large parts of Haryana and Punjab are classified by the Indian government as either "over-exploited" or at "critical". The two States extract between 35% and 57% more groundwater annually than their aquifers naturally replenish, according to government data for 2024 and 2025.

Growers constrained to existing borewells are in turn spending more money on longer pipes and more powerful pumps, the farmers said.

Producing a single kilogram of rice consumes 3,000-4,000 litres of water, according to farm economist Ashok Gulati, who previously advised the government on crop prices. That is between 20-60% more than the global average, according to farm-policy experts.

There are some signs that Indian officials are hoping to break the vicious cycle between subsidies and groundwater extraction. Haryana last year began offering a subsidy of ₹17,500 per hectare to encourage farmers to switch to crops such as millets, which require less water. However, the incentive is available only for one growing season.

Even in years of good monsoon rainfall, extraction continues at unsustainable rates, indicating a **structural rather than climatic problem**.

Economic Burden on Farmers

Falling water tables increase input costs due to deeper drilling, longer pipelines, and higher energy use.

This creates a debt trap for farmers, undermining the very income security that MSP and subsidies aim to provide.

Government Response and Limitations

Some corrective measures are emerging, such as Haryana's incentive of ₹17,500 per hectare for shifting to less water-intensive crops like millets.

However, these schemes are **short-term, limited in scale, and lack assured procurement**, making them unattractive compared to rice.

Absence of a coherent **crop diversification policy**, weak market linkages for alternative crops, and political economy constraints limit reform effectiveness.

Broader Implications

Environmental Sustainability: Continued groundwater depletion threatens long-term agricultural productivity and drinking water security.

Food Security vs Ecological Security: India produces far more rice than required domestically, raising questions about export-led surplus production at the cost of natural resources.

Policy Coherence: The issue reflects a mismatch between agricultural pricing policy, water governance, and climate resilience strategies.

Conclusion

India's emergence as the world's leading rice producer is a short-term economic success but a long-term ecological warning. The crisis in Punjab and Haryana illustrates how input subsidies and price incentives, when misaligned with resource endowments, can lead to environmental degradation and farmer distress. For sustainable agriculture, India must urgently recalibrate its policy framework—by rationalising subsidies, promoting crop diversification, strengthening groundwater regulation, and aligning food security goals with ecological limits.

UPSC Prelims Exam Practice Question

Ques: The classification of groundwater blocks in India as "safe", "semi-critical", "critical" and "over-exploited" is primarily done on the basis of:

(a) Rainfall variability

(b) Percentage of groundwater extraction relative to annual recharge

(c) Cropping intensity

(d) Depth of borewells

Ans : c)

UPSC Mains Exam Practice Question

Ques: Discuss the linkages between minimum support prices, power subsidies, and groundwater over-extraction in India. How can crop diversification be made economically viable for farmers? **(150 Words)**

Page 08 : GS II : International Relations

The announcement by former U.S. President Donald Trump in September 2025 to impose a 100% tariff on branded and patented pharmaceutical imports from October 1, 2025, has introduced a major external shock for India's pharmaceutical sector. As the world's leading supplier of affordable generic medicines and a critical pillar of global health security, India now faces a strategic inflection point where trade protectionism, supply-chain geopolitics, and domestic reform imperatives intersect.

The U.S. tariff shock, India's pharma future

In September 2025, U.S. President Donald Trump's sweeping announcement imposing a 100% tariff on branded and patented pharmaceutical imports from October 1, 2025, saw India's pharmaceutical industry, which has long been hailed as the "pharmacy of the world", standing at a crossroads. The U.S.'s move, ostensibly aimed at bolstering domestic manufacturing, threatens to disrupt supply chains that have saved the U.S. health-care system billions of dollars while also fuelling India's export-led growth.

Yet, as tariffs ripple through global markets, India's dominance in generics offers a vital buffer, even as it underscores the urgent need for diversified partnerships and domestic reforms. With pharma exports to the U.S. alone reaching close to $9 billion in fiscal 2025 – a 14.29% surge year-on-year – the stakes could not be higher for India's $50 billion pharmaceutical sector, which contributes nearly 1.72% to the nation's GDP.

A global perspective
Global pharmaceutical exports, valued at over $850 billion in 2024, thrive on aging populations, chronic diseases, and post-COVID-19 pandemic innovation. Germany ($119.85 billion), Switzerland ($99.08 billion), and the U.S. ($90.30 billion) were lead exporters in 2023-24, while the U.S. ($212.67 billion in imports in 2024), Switzerland, Germany, Belgium, and China top importers. The European Union (EU)'s €313.4 billion in medicinal exports in 2024, up 13.5%, reflects resilience amid geopolitical tensions. India, the third-largest exporter by volume, shipped $27 billion in 2023, rising to $30.47 billion in FY25.

Generics dominate, with 70% of exports to the U.S. and Europe. However, $5 billion in annual imports, mainly active pharmaceutical ingredients (API) from China (72% share), exposes supply chain risks. The sector's 10%-12% CAGR adds 0.5%-1% to GDP growth annually, bolstering

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For India, its strength in generics acts as a buffer, but diversification and reforms are a necessity

forex reserves. The U.S. tariff, which has spared generics for now, targets branded drugs unless made domestically. India supplies 40% of U.S. generics, saving payers $219 billion in 2022. Yet, the market jitters were immediate with the shares of pharma majors falling and erasing millions in market cap. An escalation to generics could cut export revenues by 10%-15%, trimming GDP growth by 0.2%-0.3% in FY26. Some firms with over 30% U.S. exposure, face rerouting costs, regulatory hurdles, API inflation (up 5%-7%), and stalled research and development. This could spur "China-plus-one" strategies, redirecting exports to Africa and Southeast Asia, potentially raising India's regulated market share from 3% to 3.5% by 2030.

India's Goods and Services Tax (GST) rationalisation, effective September 22, 2025, provides domestic ballast. Drug and medicine rates dropped from 12% to 5%, with 36 essential items at nil, saving consumers $1.2 billion annually. Medical device rates fell from 18% to 5%, easing $5 billion in imports. No re-labelling for pre-September stocks minimises disruptions. Aligned with Ayushman Bharat, this boosts consumption by 8%-10%, insulating markets from tariff-driven hikes.

On eastern scale
Global trade pits western innovation against eastern scale. Under the U.S.-EU pact, EU exports of medicinal and pharmaceutical products to the U.S. ($65.7 billion from Ireland in 2024), prioritises supply chain security. China's 2025 agreements, capturing 32% of Q1 global biotech deals, and $2.5 billion in U.S. molecule licensing in H1 2025, signal eastern strength. India's diplomacy has seen the signing of six memoranda of understanding (MoU) with Trinidad and Tobago in July 2025 (it includes cooperation in pharmaceuticals), a Singapore API pact, and Serum Institute's dengue treatment collaboration for low-middle-income nations. These, alongside

iPHEX (the international pharmaceutical exhibition) could double exports to Africa significantly. With 35% of pharmaceutical exports U.S.-bound, eastern alliances could offset 20%-25% of tariff risks.

Bullish forecasts
Forecasts paint a bullish canvas: India's pharma market, valued at $50 billion in 2023-24, has a goal of reaching $130 billion by 2030 (11%-12% CAGR), with exports surging to $120-$130 billion. Globally, spending could hit $1.5 trillion by 2029, fuelled by biosimilars and precision medicine. India's API sector could grow to ₹1.82 trillion by 2030 ($22 billion), with PLI schemes reclaiming 20% domestic production.

Challenges such as IP disputes and API dependency persist, but resilience shines through initiatives such as Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP). Under the PMBJP, a total of 16,912 Jan Aushadhi Kendras have been opened (June 2025), with 2,110 medicines and 315 surgicals, medical consumables and devices under the scheme product basket.

Tariffs threaten affordability, with U.S. cancer therapy costs potentially rising $8,000-$10,000 for a 24-week course, mirroring India's 60% out-of-pocket burden. Generics, 80% cheaper, enable 20 million treatments yearly, though quality concerns and disruptions risk delaying surgeries by 15%-20%. PMBJP's oncology basket, cutting costs by 70%, proves that domestic buffers work.

U.S. tariffs risk causing shortages if India's 40% generic supply frays. India must leverage MoUs, invest $10 billion in APIs via PLI 2.0, and push WTO reforms. With global pharma eyeing $450 billion for India by 2047, collaboration in the form of east-west hybrids, innovation, and equitable access is key. Policymakers must diversify boldly, reform swiftly, and secure India's pharma supremacy.

India's Pharmaceutical Sector: Strategic Context

India is the third-largest pharmaceutical exporter by volume, with exports rising to $30.47 billion in FY25.

The sector contributes ~1.72% to GDP and adds 0.5–1% annually to economic growth.

The U.S. market alone accounts for ~35% of India's pharma exports and nearly 40% of U.S. generic drug supplies, saving the U.S. healthcare system billions of dollars annually.

India's strength lies in generics, which constitute around 70% of exports to the U.S. and Europe. Crucially, these have been spared from the tariff for now, providing India with a short-term buffer.

Key Implications of the U.S. Tariff Decision

Trade and Supply-Chain Disruptions

Tariffs on branded drugs could disrupt global pharmaceutical value chains that rely on cost-efficient Indian manufacturing.

Firms with high U.S. exposure may face rerouting costs, regulatory delays, API inflation, and reduced R&D spending.

Macroeconomic Impact

A future extension of tariffs to generics could reduce export revenues by 10–15%, potentially shaving 0.2–0.3% off GDP growth in FY26.

Market reactions already reflect uncertainty, with pharma stocks losing significant market capitalisation.

API Dependency Risk

India imports nearly 72% of its APIs from China, exposing vulnerabilities in times of geopolitical stress and trade shocks.

This reinforces the need for domestic API capacity and supply-chain resilience.

Opportunities Amid the Shock

Generics as a Strategic Shield

India's dominance in low-cost generics, which are 80% cheaper than branded alternatives, ensures continued relevance in global healthcare, especially for ageing populations and chronic diseases.

Market Diversification and South–South Cooperation

New MoUs with countries in the Caribbean, Southeast Asia, and Africa reflect India's shift towards export diversification.

"China-plus-one" strategies could increase India's regulated market share from 3% to 3.5% by 2030.

Domestic Policy Support

GST rationalisation (September 2025)—reducing tax rates on medicines and medical devices—strengthens domestic demand and cushions export shocks.

Schemes like Pradhan Mantri Bhartiya Janaushadhi Pariyojana enhance affordability, reduce out-of-pocket expenditure, and act as internal stabilisers.

PLI and Atmanirbhar Bharat Push

Production Linked Incentive (PLI) schemes aim to reclaim 20% domestic API production by 2030, addressing long-standing import dependence.

Geopolitical and Governance Dimensions

The tariff episode reflects a broader trend of trade nationalism vs global public health needs.

It raises concerns at multilateral forums such as the WTO regarding equitable access to medicines.

India's diplomatic outreach and regulatory credibility will be key to sustaining trust in its pharmaceutical exports.

Challenges Ahead

Intellectual property disputes, regulatory harmonisation, and quality assurance remain persistent hurdles.

Overdependence on a single export market (the U.S.) exposes structural fragility.

Rising healthcare costs globally underline the ethical dimension of trade barriers in essential medicines.

Conclusion

The U.S. tariff shock is both a warning and an opportunity for India's pharmaceutical sector. While protectionist measures threaten short-term exports and market confidence, India's strength in generics, expanding South–South partnerships, domestic policy reforms, and PLI-led manufacturing resilience provide strong counterweights. For India to retain its status as the "pharmacy of the world," policymakers must accelerate diversification, reduce API dependence, strengthen innovation ecosystems, and align trade diplomacy with global health equity.

UPSC Mains Exam Practice Question

Ques : India is often described as the "pharmacy of the world". Critically analyse how India's dominance in generic drugs both cushions and constrains its response to external trade shocks such as U.S. pharmaceutical tariffs. **(250 words)**

Page 10 : GS II : Governance / Prelims Exam

The Supreme Court of India, in Samiullah vs State of Bihar (2025), struck down certain sub-rules inserted into the Bihar Registration Rules, 2019, which allowed registering authorities to refuse registration of property transfer documents (sale/gift deeds) unless the seller produced proof of mutation (such as Jamabandi or holding allotment).

On property registration and title

What did the Supreme Court rule in *Samiullah vs State of Bihar*? Why did the court strike down Bihar's mutation-linked registration rules? Why is registration legally distinct from title or ownership? What structural flaws make land transactions 'traumatic' in India?

EXPLAINER

Girija Bhosale
Malini Mallikarjun

The story so far:

The Supreme Court of India, in its recent decision in *Samiullah vs State of Bihar*, described the process of buying and selling property as "traumatic" for many Indians. The observation resonates widely, reflecting the complex and often challenging realities of land transactions in the country.

What did the Supreme Court rule in the Samiullah case?

The Supreme Court examined the validity of sub-rules introduced under the Bihar Registration Rules in 2019, which empowered the registering authorities to refuse the registration of documents transferring property, such as sale or gift deeds, if the seller could not provide proof of mutation, including documents like a *Jamabandi* or holding allotment.

The court struck down these sub-rules as ultra vires and arbitrary for three reasons.

First, the rules went beyond the powers granted to the Inspector General of Registration under the Registration Act. Second, by making the sellers produce proof of mutation as a precondition for registering a document, the rules effectively demanded evidence of title. This was held to be contrary to the object of the Registration Act. It curtailed the ability to freely transfer property, thereby significantly impacting the constitutionally protected right to property. Third, with the Bihar Mutation Act and the Bihar Special Survey and Settlement Act far from completion, obtaining proof of mutation was virtually impossible.

The court reaffirmed that the registration of a transfer deed is distinct from establishing title or ownership. The enquiry into questions of title and ownership falls within the scope of civil courts and not registration offices. The court concluded that the preconditions for registration pertain to the identification of the property and the seller. References to maps or surveys are made only for this purpose, if it is practicable.

Why is registration different from title?

The State of Bihar argued that mandatory proof of mutation would ensure the integrity of sale transactions by aligning registration with the actual title. While the court acknowledged the merit in synchronisation, it cited the lack of nationwide land surveys since 1850 and insufficient digitisation of land records as significant obstacles.

The court observed that, until a conclusive titling is integrated with the registration process, it remains the responsibility of constitutional courts to strike a balance between individuals' freedom to buy and sell property and the government's obligation to maintain the integrity of property transactions.

In June, in *K.Gopi vs Sub-Registrar*, the Supreme Court had clarified the position of law on registration and title by holding that the Sub-Registrar is not concerned with the title of the property as he lacks the adjudicatory power to decide ownership-related questions. Thereby, it struck down a rule framed by the State of Tamil Nadu that empowered Sub-Registrars to refuse registration of

sale deeds on the ground that the seller had not established title or ownership. The rule mandated the seller to produce the original deed through which ownership was acquired.

A similar line of reasoning is evident in the court's successive judgment in *Samiullah*.

Both decisions underscore that the Registration Act is concerned only with the registration of documents. Registration creates only a rebuttable presumption of ownership, not conclusive proof. The forthcoming Registration Bill, 2025 – which seeks to replace the Registration Act of 1908 – is consistent with this position. The premise of these regulations is that the power to refuse registration cannot be construed as empowering registering officers to adjudicate upon questions of title or ownership of property, which are within the jurisdiction of a competent court.

While this position merely reinforces a long-established principle, it is still a timely reminder of the complexity of land administration and the need to reform it.

Why has buying and selling property become 'traumatic' in India?

Land governance in India is a mixture of colonial legislation, complex administrative set-ups, and an overburdened judiciary. This often results in prolonged battles for land, be it bureaucratic or judicial.

Three separate domains – Registration, Survey and Settlement, and Revenue – operate independently, making synchronisation of records a persistent challenge. Each department is governed by a separate legislative and administrative mandate. Further, the current system creates only a presumption of title, which can be challenged in court using evidence such as previous deeds, revenue receipts, mutation records, proof of possession, or even competing sale deeds. This places a heavy burden on buyers to conduct exhaustive due diligence before purchasing property.

Along with understanding legislative and administrative designs on land records, it is important to recognise the complexities that stem from the historical inconsistencies in land governance across

the Indian subcontinent. Over centuries, the region has been governed by various rulers, each implementing distinct revenue systems. The legacy of diverse administrative practices, colonial rule, separate rules applied in princely states, the creation of different types of titles, and significant post independence reforms, such as land ceiling acts, has resulted in a highly intricate and regionally varied socio-legal framework for land.

What is the way forward for land administration reform?

The solution lies in large scale administrative reform. The focus needs to be on creating an integrated and synchronised record-keeping system that minimises the risk of fraud. Efforts are under way at both the Union and State levels to digitise and modernise land records.

For instance, Karnataka's Bhoomi and KAVERI systems link records of rights with registration, automatically updating ownership records upon the registration of transfer deeds. Similar integration efforts are being attempted for spatial data and revenue records, though primarily for agricultural land.

Technology is playing a key role in these reform initiatives. From digitising records to making workflow processes tech-enabled, there is also growing discussion on the role of artificial intelligence and blockchain technologies. In fact, in its recent decision, the Supreme Court suggested exploring blockchain technology to create secure, transparent, and tamper-proof land records. Andhra Pradesh's pilot project using blockchain for land records has reportedly halved land disputes and improved transaction efficiency by 30%.

How would blockchains work?

Blockchain, as its moniker suggests, is a chain of blocks of data linked into an uneditable, digital chain. This information is stored in an open source, decentralised environment, in which each block's information is confirmable by every participating computer. Unlike traditional hierarchical systems, it's designed to have decentralised management, which is intended to build trust and stability.

Blocks are the ledgers that are being updated and added to, filled with permanently recorded data. Transactions are added to this database and synced across all nodes. These blocks operate on a distributed ledger, meaning that all information and transactions are shared between parties regardless of geography or status.

These ledgers can be permissioned or unpermissioned, depending on who is allowed to view them. The nature of this decentralised block database system keeps hackers from tampering with or changing information on the blockchain, as altering a single piece of code would be immediately recognisable. Attempting to double-spend, fraudulently duplicating the digital currency or asset, is difficult to do because of the distributed ledger transaction system.

In this way, the distributed ledger is an immutable record that is consistent and chronologically organised. If we apply this system to land records, we could create a block for a single piece of land containing all its historical records, title, heirs of title holders, geographic location, survey details, its map, water resources, crops, along with all registered documents associated with the particular land. Any further transactions of the same land will create another connected block of information, creating a constantly updated, transparent and immutable network of land records. However, we must also ensure that information stored in these blocks is accurate, else it would create an additional burden on owners to correct such data. More importantly, existing land administration and related structures need to be accounted for before the introduction of newer technologies.

The Supreme Court's recent decision highlights the urgent need for administrative and technological reforms. Understanding the deep-rooted complexities of India's land governance is the first step towards meaningful solutions that secure the right to property for all.

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THE GIST

▼
The Supreme Court struck down Bihar's mutation-linked registration rules as ultra vires and arbitrary, reaffirming that registration of a transfer deed is distinct from establishing title or ownership, which lies within the jurisdiction of civil courts.

▼
The rulings in Samiullah and K. Gopi underscore that the Registration Act is concerned solely with the registration of documents and creates only a rebuttable presumption of ownership, not conclusive proof.

▼
By describing property transactions as 'traumatic', the court said the deeper problems of fragmented land governance, unsynchronised records and the urgent need for administrative and technological reform, including integrated and digitised land records.

GETTY IMAGES

The Court held these sub-rules to be ultra vires, arbitrary, and unconstitutional for three core reasons:

Excess of delegated power: The Inspector General of Registration exceeded authority granted under the Registration Act by introducing substantive conditions not contemplated by the parent statute.

Conflation of registration with title adjudication: Making mutation proof a precondition effectively required sellers to establish title, which is outside the scope of registration authorities and contrary to the object of the Registration Act.

Practical impossibility and arbitrariness: Since Bihar's mutation and survey processes are incomplete, requiring mutation proof made lawful registration virtually impossible, violating the constitutional right to property (Article 300A).

Why did the Court strike down Bihar's mutation-linked registration rules?

Registration is procedural, not adjudicatory: Registering officers are meant to verify identity of parties and property, not determine ownership.

Title disputes fall within civil courts' jurisdiction, not executive offices.

Linking registration to mutation would curtail free transferability of property, causing serious civil and economic consequences.

The Court reaffirmed that references to maps or surveys during registration are only for identification, not for title verification.

Why is registration legally distinct from title or ownership?

The judgment reiterates a settled legal principle:

Registration:

Governed by the Registration Act

Records transactions

Creates only a rebuttable presumption of ownership

Title / Ownership:

Determined through civil adjudication

Based on evidence such as prior deeds, possession, inheritance, revenue records, etc.

This position was earlier clarified in K. Gopi vs Sub-Registrar (2024), where the Supreme Court invalidated a similar Tamil Nadu rule requiring sellers to prove title before registration.

Importantly, the forthcoming Registration Bill, 2025, which seeks to replace the Registration Act, 1908, maintains this clear separation between registration and title adjudication.

What structural flaws make land transactions 'traumatic' in India?

The Court's remark that property transactions are "traumatic" reflects deep-rooted systemic problems:

1. Fragmented Land Administration

Three parallel and poorly coordinated systems:

Registration Department

Revenue (Mutation) Department

Survey and Settlement Authorities

Each operates under separate laws, databases, and bureaucracies.

2. Presumptive, Not Conclusive, Titling

India follows a presumptive title system, unlike Torrens-style conclusive titling.

Any title can be challenged in court, increasing litigation risk and transaction uncertainty.

3. Historical and Regional Complexity

Multiple revenue systems (Zamindari, Ryotwari, Mahalwari)

Colonial legacies, princely state variations

Post-independence land reforms and ceiling laws → Resulting in inconsistent and overlapping records

4. Overburdened Judiciary

Title disputes take years or decades, raising transaction costs and discouraging formalisation.

5. High Due Diligence Burden on Buyers

Buyers must verify decades of records across departments, often without certainty.

What is the way forward for land administration reform?

1. Integrated Land Record Systems

Synchronisation of registration, mutation, and survey data

Example: Karnataka's Bhoomi–KAVERI integration

2. Digitisation and Technology Adoption

End-to-end digital workflows

Linking spatial (GIS) data with legal records

3. Blockchain-Based Land Records

The Supreme Court itself suggested exploring blockchain technology to create:

Immutable

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Transparent

Tamper-proof

  land records.

Andhra Pradesh's pilot project reportedly:

Reduced land disputes by ~50%

Improved transaction efficiency by ~30%

However, the Court cautioned that:

Technology cannot fix incorrect legacy data

Institutional and legal reforms must precede or accompany tech adoption

Conclusion

The Samiullah judgment is not merely about registration rules in Bihar; it is a constitutional reminder that administrative convenience cannot override property rights and due process. By reaffirming the legal distinction between registration and title, the Supreme Court has exposed the structural infirmities of India's land governance system. Meaningful reform now requires integrated administration, conclusive titling, judicial restraint in executive functions, and cautious use of technology. Only then can property transactions in India move from being "traumatic" to trustworthy.

UPSC Prelims Exam Practice Question

Ques: With reference to the Supreme Court judgment in Samiullah vs State of Bihar, consider the following statements:

1. The Supreme Court held that registering authorities can refuse registration if title is not conclusively proved.

2. The Court ruled that registration of a document creates only a rebuttable presumption of ownership.

3. Mutation is a fiscal entry and does not by itself confer title over property.

Which of the statements given above is/are correct?

(a) 1 only

(b) 2 and 3 only

(c) 1 and 2 only

(d) 1, 2 and 3

Ans: b)

UPSC Mains Exam Practice Question

Ques : Why has land governance in India resulted in high transaction costs and litigation? Examine the structural and historical causes. (150 words)

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THE HINDU
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Daily News Analysis

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India's space programme, a people's space journey

India's space journey has evolved beyond a string of spectacular missions. It has the national pulse and is a source of daily inspiration. In June 2025, when Group Captain Shubhanshu Shukla displayed the Tricolour aboard the International Space Station (ISS) and spoke to Prime Minister Narendra Modi, it was a moment of pride for every Indian. The Prime Minister called it a "defining chapter" of *Amrit Kaal* ('era of nectar'), and for many, that moment felt like India's ascent was a part of their own heartbeat. It was not just science. It was identity being reshaped through vision and purposeful programmes.

That same spirit has been echoed earlier, on August 23, 2023, when Chandrayaan-3 made India the first nation to land near the lunar south pole. "India is now on the Moon," declared Mr. Modi – words which rippled through classrooms, villages and living rooms alike. India's lunar programme has been truly path breaking: Chandrayaan-1 (2008) confirmed the presence of water molecules; Chandrayaan-2 (2019) mapped the moon with high precision and prepared the ground for Chandrayaan-3 (2023), which achieved the world's first soft landing near the south pole. When the Vikram lander and Pragyan rover explored the lunar surface for a full moon day, this led children to draw depictions of lunar landscapes in notebooks, it left researchers feeling vindicated, and inspired citizens who saw India's story in space as also their own future.

India has become a trusted global partner in space. Over 400 foreign satellites have been launched aboard Indian rockets. In 2014, India became the first Asian nation and only the fourth in the world to reach Mars orbit – and on its maiden attempt, with the Mars Orbiter Mission (Mangalyaan). The Aditya-L1 mission (2023), built through multi-institutional collaboration, is providing unprecedented insights into the sun's corona and its impact on space weather. XPoSat (2024) is studying black holes, while SpaDeX (2024) has demonstrated in-orbit docking for future space stations and lunar missions.

A new space vision

These milestones are reshaping policy, culture, and aspiration. The road map is bold: continuation of the Gaganyaan programme for human spaceflight, Chandrayaan-4 and 5 for deeper lunar exploration, a dedicated Venus mission, a Bharatiya Antariksh Station (BAS) by 2035, and an Indian human landing on the Moon

S. Somanath

was Secretary, Department of Space, and Chairman of the Indian Space Research Organisation (ISRO). He is now Distinguished Visiting Professor, Indian Institute of Science (IISc), Bengaluru, and Adviser (Space Technology), Government of Andhra Pradesh

India is not only an active participant in the space age but is also shaping it

by 2040. These are not distant dreams but national goals, aligned with the spirit of *Amrit Kaal*.

The Prime Minister has called for building a pool of 40 to 50 trained astronauts for future missions. On National Space Day 2025 (August 23), he urged young citizens to see themselves as participants in India's human space programme. Gaganyaan, with an approved outlay of over ₹20,000 crore, is advancing steadily. Four Indian Air Force test pilots are undergoing training, and a series of uncrewed and crewed flights will culminate in India's first indigenous human space mission, presently targeted for 2027.

Space technology today is woven into the fabric of governance and daily life. Satellites deliver disaster warnings, guide fishermen, assess crop yields and insurance claims, enhance railway safety, and power the geospatial backbone of the PM Gati Shakti programme. Space is no longer a distant luxury but a democratic utility – accessible to every citizen.

At the same time, space exploration fuels Science, Technology, Engineering and Mathematics (STEM) education, advanced research, and workforce development. Future-ready technologies in space operations autonomy, robotics, in-space manufacturing, surveillance and interplanetary travel are being developed, ensuring that India retains leadership in this strategic frontier.

The transformation of India's space sector is deliberate and ambitious. The opening of the field to private players, creating a thriving ecosystem of more than 350 startups building satellites, launch vehicles, and ground systems. The space budget has nearly tripled – from ₹5,615 crore in 2013-14 to ₹13,416 crore in 2025-26 – and has been augmented by nearly ₹5,000 crore in user funds. India's space economy, currently valued at $8 billion, is projected to grow to $44 billion in the years ahead, creating jobs, industries and innovations that orbit around this sector.

Inspiring the next generation

The Prime Minister has challenged the ecosystem to deliver five space unicorns within the next five years and to scale up annual launches, nearly ten-fold, to 50 a year. With private participation, India is advancing technologies related to semi-cryogenics, electric propulsion, quantum communication and in-orbit servicing.

Youth are at the heart of this vision. The International Olympiad on Astronomy and Astrophysics hosted in India (August 2025) drew nearly 300 participants from over 60 countries, with Indian students winning medals. Initiatives such as the ISRO Robotics Challenge and Indian Space Hackathon/Bharatiya Antariksh Hackathon are bringing school and college students into direct contact with rovers, satellites and rockets, building confidence that the laboratories and launchpads of tomorrow are theirs to claim.

At the policy level, the National Meet 2.0 held just before National Space Day produced 5,000-plus pages of documentation across 300 user interactions. This 15-year road map aligns every mission with the vision of Viksit Bharat 2047.

Global collaborations and leadership

Space has been consistently projected as a global commons, where India's leadership translates into shared progress. The South Asia Satellite has provided neighbours with communication capacity, while during India's G-20 Presidency in 2023, India announced a "G20 satellite" for climate and environmental monitoring with data shared with all nations. Collaborative missions such as NASA-ISRO Synthetic Aperture Radar (NISAR) with the National Aeronautics and Space Administration (NASA), Thermal infraRed Imaging Satellite for High-resolution Natural resource Assessment (TRISHNA) with CNES (French space agency), Lunar Polar Exploration (LUPEX) with Japan Aerospace Exploration Agency (JAXA), and India's participation in the European Space Agency (ESA)'s Proba-3 demonstrate India's rise as a global partner, guided by the ethos of *Vasudhaiva Kutumbakam* ('the world is one family').

India's space journey is more than rockets and satellites. It is about a nation discovering new ways to see itself. The salute of Shubhanshu Shukla aboard the ISS, the landing of Chandrayaan-3, 350 startups from small towns designing space systems, young students competing in Olympiads, and satellites quietly serving national security and citizen services are all part of the same story.

In this *Amrit Kaal*, India is not simply participating in the space age. It is shaping it. With ambition, confidence, and purpose, Bharat looks to the stars knowing that the horizon belongs to it too.

The views expressed are personal

GS Paper III : Science and Tech

UPSC Mains Exam Practice Question : India's space programme has evolved from mission-centric achievements to a people-centric national endeavour. Critically examine this statement in the context of recent ISRO missions and policy reforms. **(150 words)**

Context :

India's space programme has entered a qualitatively new phase, evolving from a state-led scientific enterprise into a people-centric national mission. As articulated by former ISRO Chairman S. Somanath, recent milestones—from India's presence aboard the International Space Station to lunar and solar missions—have embedded space exploration into India's national consciousness. Under the leadership of the Indian Space Research Organisation, India's space journey today reflects not only technological capability but also social inspiration, strategic autonomy, and developmental utility, aligning closely with the vision of Amrit Kaal and Viksit Bharat 2047.

Key Milestones and Achievements

Human Presence and National Pride

- The symbolic moment of an Indian astronaut aboard the International Space Station reinforced India's arrival as a mature spacefaring nation.

- Such events have transformed space achievements into shared national experiences, strengthening scientific temper and public engagement.

Path-breaking Scientific Missions

- Chandrayaan-3 made India the first country to achieve a soft landing near the Moon's south pole, building on the scientific legacy of Chandrayaan-1 and 2.

- Missions such as Aditya-L1 (solar studies), XPoSat (black hole research), and SpaDeX (in-orbit docking) highlight India's expanding footprint in frontier space science.

- The Mars Orbiter Mission (Mangalyaan) demonstrated India's cost-effective and reliable space engineering.

Roadmap for the Future

- Flagship programmes include Gaganyaan, Chandrayaan-4 and 5, a Venus mission, the Bharatiya Antariksh Station (by 2035), and a human Moon landing by 2040.

- These goals position India among a select group of nations shaping the future architecture of space exploration.

Space as a Developmental and Governance Tool

Space technology now underpins disaster management, agriculture, fisheries, railway safety, urban planning, and logistics, notably through platforms such as PM Gati Shakti.

Satellites have democratised access to information, making space a public utility rather than an elite scientific pursuit.

This aligns space policy with Sustainable Development Goals (SDGs) and inclusive governance.

Economic and Industrial Transformation

Liberalisation of the space sector has catalysed a vibrant private ecosystem of over 350 startups, spanning launch vehicles, satellites, propulsion, and downstream services.

India's space budget has nearly tripled since 2013–14, while the space economy is projected to grow from $8 billion to $44 billion, generating employment and high-value manufacturing.

Strategic technologies such as semi-cryogenic engines, electric propulsion, quantum communication, and in-orbit servicing enhance India's strategic and commercial competitiveness.

Youth, Innovation, and Scientific Temper

Initiatives such as space hackathons, robotics challenges, and international astronomy Olympiads have made youth stakeholders in India's space future.

By integrating STEM education with live missions and real-world challenges, India is building a future-ready workforce for advanced technologies.

Global Cooperation and Leadership

India has positioned space as a global commons, reflected in initiatives like the South Asia Satellite and the proposed G20 climate satellite.

Collaborative missions with NASA (NISAR), CNES (TRISHNA), JAXA (LUPEX), and ESA demonstrate India's role as a trusted and equal global partner, guided by the ethos of Vasudhaiva Kutumbakam.

Conclusion

India's space programme today represents more than technological milestones; it embodies a national transformation where science, aspiration, governance, and identity converge. By combining cost-effective innovation, inclusive participation, private-sector dynamism, and global cooperation, India is redefining what it means to be a space power. In the Amrit Kaal, India is not merely reaching for the stars—it is ensuring that the benefits of space touch every citizen, making its journey truly a people's space journey.