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GS Paper II – International Relations

Will completely close Hormuz Strait: Iran after Trump's threat

U.S. President had threatened to 'obliterate' Iran's power plants if Tehran did not fully reopen the Strait within 48 hours; hitting back, Iran's Parliament Speaker says critical infrastructure in West Asia could be 'irreversibly destroyed' if attacked

Reuters
Agence France-Presse
WASHINGTON/TEHRAN

The Iranian military on Sunday threatened to completely shut down the strategic Strait of Hormuz and attack U.S. infrastructure, including energy facilities in the Gulf, if U.S. President Donald Trump acts on threats to target the country's power plants.

Mr. Trump on Saturday threatened to "obliterate" Iran's power plants if Tehran did not fully reopen the Strait of Hormuz within 48 hours, suggesting a significant escalation barely a day after he talked about "winding down" the war, now in its fourth week.

Treasury Secretary Scott Bessent said that the U.S. may need to "esca-



Assessing damage: People inspecting the site of an Iranian missile strike in Dimona, Israel on Sunday. AFP

late" its attacks against Iran to be able to wind down the war. Asked if Mr. Trump was winding down or escalating the war, he said: "They're not mutually exclusive. Sometimes you have to escalate to de-escalate."

The strait has been ef-

fectively closed since the start of the war, sparked by U.S.-Israeli bombardment of Iran. The conflict has since spread across West Asia, with Iran responding with attacks on Israel and U.S. interests in the region.

"If the U.S.'s threats regarding Iran's power plants

PM chairs meet to review impact of conflict on India

The Hindu Bureau
NEW DELHI

As tensions continue to mount in West Asia, Prime Minister Narendra Modi on Sunday chaired a meeting of the Cabinet Committee on Security (CCS) to review the

situation and suggest mitigating measures.

A government statement said that the conflict's impact over the short, long and medium term were assessed.

FULL REPORT ON
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are carried out... the Strait of Hormuz will be completely closed, and it will not be reopened until our destroyed power plants are rebuilt," military's operational command Khatam Al-Anbiya said.

Iran's Parliament Speaker Mohammad Baqer Gha-

libaf wrote on X that critical infrastructure in West Asia could be "irreversibly destroyed" should Iranian power plants be attacked.

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GS Paper II – International Relations

NEWS IN NUMBERS

Number of trips under free bus travel scheme since inception

898 crore. Tamil Nadu Chief Minister M. K. Stalin on Sunday hailed the success of the 'Vidiyal Payanam' free bus travel scheme for women, stating that the initiative has recorded nearly 898 crore trips since its inception. **PM**

Number of dog-bite cases in Rajasthan in 2025

900 An RTI application revealed that the State reported more than 460 dog-bite cases in 2024, which rose to over 900 in 2025. Jaipur recorded the highest numbers both years, with cases surging from 307 in 2024 to 633 in 2025. **PM**

GS Paper II – Polity

Is compulsory voting feasible in the Indian context?

How can voter turnout be increased without making voting mandatory?

Rangarajan R.

The story so far:

The Election Commission has announced the poll schedule for five Assembly elections to be held in April-May 2026. In a separate hearing before the Supreme Court on a poll-related matter, the court raised questions regarding mandatory voting in elections.

What is the right to vote in India?

Article 326 of the Constitution grants every citizen the right to vote without any discrimination. It provides that any citizen who is not less than 18 years old and is not otherwise disqualified under the Constitution or any law on certain grounds is entitled to be registered as a voter.

Section 19 of the Representation of the People Act, 1950, requires a citizen to be at least 18 years old and ordinarily resident in a constituency to be registered as an elector. Section 62 of the Representation of the People Act, 1951, provides the right to vote to every person whose name is entered in the electoral roll of a constituency. In various cases, the Supreme Court has held that the right to vote is a statutory right.

Should voting be made compulsory?

Voting is essential for a functional democracy, but it is neither a fundamental duty nor a legal duty in India. Proposals for compulsory voting have long been debated.

The Dinesh Goswami Committee on electoral reforms, set up in 1990, did not favour compulsory voting, citing practical

difficulties in implementation. Instead, it recommended improving voter participation through awareness campaigns.

The Law Commission, in its 255th report (2015), discussed the issue in detail. Compulsory voting does result in increased voter turnout by an average of about 7%. Nevertheless, this increase in participation is a direct corollary of the severity and strict enforcement of penalties for not voting.

Some democracies, such as Australia and several Latin American countries, have provisions for compulsory voting. In Australia, Argentina, and Brazil, voters may be fined if they fail to vote without valid reasons. In Peru, certain public goods and services are denied to non-voters.

Penalising non-voters by imposing fines

or restricting their access to government services is an extremely harsh measure that will not work in the Indian context. From a constitutional perspective, compulsory voting could be seen as violating the fundamental right to freedom of expression under Article 19(1).

What can be the way forward?

Low voter turnout can result in candidates winning by securing a minority of the total votes in a constituency.

However, as discussed in the Law Commission report, compulsory voting is neither desirable nor feasible in India. The solution lies in fostering enthusiasm amongst voters to exercise their right to vote through innovative campaigns, especially using social media.

For migrant workers, stricter implementation of the statutory holiday on the day of polling, coupled with an increase in transport facilities by running special buses and trains, can effectively increase participation. With the advent of newer technologies, robust and secure methods acceptable to all stakeholders for remote voting should be considered. (Rangarajan R. is a former IAS officer and author of 'Courseware on Polity Simplified.' He currently trains at Officers IAS academy. Views expressed are personal)

THE GIST

The right to vote in India is a statutory right under Article 326 and the Representation of the People Act, and compulsory voting is neither a fundamental duty nor a legal duty.

While higher voter turnout shows a more representative democracy, compulsory voting is neither desirable nor feasible, and the focus should be on awareness, enthusiasm, and better access for voters.



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GS Paper II – Polity

Bill to amend Transgender Persons Act faces criticism

The Hindu Bureau

NEW DELHI

† Opposition leaders and activists on Sunday spoke out against the Bill to amend the Transgender Persons (Protection of Rights) Act, 2019, which proposes to remove the right to a self-perceived gender identity and introduces the requirement for a medical board to determine whether a person is transgender based on a new definition of “transgender person”.

At a public hearing held at the Press Club of India, Rajya Sabha members from the RJD, Congress, and the CPI(M) spoke against the Bill and said there was an attempt to coordinate a strategy to oppose it within Parliament.

RJD MP Manoj Kumar Jha said the only explanation for such a “regressive” Bill was that “this government’s thinking is regressive”.



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GS Paper II – Polity

'Double engine' – cute slogan, a serious federal question

Every election season produces memorable slogans. Most fade once the votes are counted, but some linger and begin to shape how citizens think about governance itself. One such phrase is the "double-engine *sarkar*". At first hearing, it sounds harmless, even cute: two governments working in tandem to accelerate development. Yet, behind the metaphor lies a serious constitutional question about India's federal compact.

The idea is simple: if the same party governs both the Union and the State, development will move faster because the two governments will work in harmony. Taken at face value, this is unexceptionable. Of course governments at different levels should coordinate. That is indeed cooperative federalism. The real question is what happens when they do not share the same political ideology. But the "double-engine" slogan carries a deeper implication. It suggests that development flows preferentially to States governed by the same party as the Union government.

'Aligned States' benefit

During election campaigns the message is often made quite explicit: elect the party ruling at the Centre so that your State can benefit from faster development. If you do not, you will be starved of funds. This is where the constitutional difficulty begins.

India's Constitution does not envisage a system where State governments depend on the goodwill, or charity, of the ruling party at the Centre. It creates a federal structure in which the Union and the States are partners within their respective spheres. The Union government represents the Republic as a whole, not merely those States governed by the party in power in New Delhi.

Public money collected through national taxation belongs to the Union of India, not to the ruling party. Taxes are collected in the name of the Republic, from citizens of every State regardless of how they vote. The distribution of these resources cannot depend on which party governs a State. A citizen in Kerala or Tamil Nadu pays the same taxes as a citizen in Uttar Pradesh or Madhya Pradesh. The constitutional promise is that both will receive their fair share in return.

India's constitutional framers understood this danger. That is why they built institutional safeguards into the system. The most important is the Finance Commission. Under Article 280, the Finance Commission is appointed every five years to recommend how Union revenues should be shared with the States. Its purpose is vital: fiscal transfers must be rule-based, not politically negotiated. The Commission evaluates States on objective criteria – how far their incomes lag



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behind the national average, their population, geographic size, and fiscal capacity – so that politics cannot determine who gets what.

Issues raised by States, federal friction

Recent debates around fiscal federalism show how sensitive this issue remains. Southern States have expressed concern that the use of more recent population data in allocation formulas may penalise them for having successfully controlled population growth. Another issue is the increasing resort of the Union government to cesses and surcharges, which fall outside the divisible pool and are not shared with States. This effectively reduces the quantum of resources available for constitutionally mandated sharing, concentrating more fiscal power in Union hands and weakening the financial autonomy of States. The Sixteenth Finance Commission, which is currently deliberating, will have to grapple seriously with these concerns if it is to restore confidence in the fairness of the fiscal federal arrangement.

Governments in Tamil Nadu, Kerala, Karnataka, Andhra Pradesh and Telangana have argued that States which acted early to stabilise population should not be penalised in the distribution of national resources. Senior Ministers from these States have at times remarked, in visible frustration, that they feel reduced to "beggars", pleading for funds that constitutionally belong to them. This is not the language of political theatre. It reflects a genuine structural grievance about the terms on which States participate in the Indian Union.

Federal friction is visible not only in financial matters but also in the legislative process. In recent years, Governors in some States have sat for long periods over Bills passed by elected legislatures, effectively using the constitutional office as an instrument of political sabotage. Tamil Nadu and Kerala have witnessed particularly prolonged delays. The pattern is difficult to ignore: the delays have been in States that are governed by parties opposed to the ruling dispensation at the Centre. A Governor who withholds assent to legislation passed by an elected Assembly is, in effect, a second engine running in reverse.

Such delays have drawn judicial attention. In *State of Punjab vs Principal Secretary to the Governor of Punjab* (2023), the Supreme Court of India made it clear that a Governor cannot use inaction to stall the legislative process. The Court emphasised that the Governor's office is not meant to function as a parallel political authority over an elected legislature.

More recently, in *State of Tamil Nadu vs Governor of Tamil Nadu* (2025), the Court observed that prolonged inaction by a Governor

in assenting to Bills is constitutionally impermissible. These rulings together signal a firm judicial commitment to protecting the legislative sovereignty of elected State assemblies.

The experience of Delhi over the past decade provides a further illustration. Many initiatives of the elected government became entangled in disputes with the Lieutenant-Governor and the Union government. Courts eventually had to intervene. The lesson is not merely about one city; it is about what happens when the machinery of federal governance is used to punish a political opponent rather than serve the public.

Seen together – fiscal transfers, gubernatorial delays, and the Delhi impasse – these developments form a coherent pattern. The "double-engine" slogan is not merely a campaign metaphor. It is a description of how governance actually functions when political alignment is absent. And that is precisely the constitutional problem. The form of federalism survives; its spirit is quietly hollowed out.

India's federal system has faced similar tensions before. In earlier decades, Article 356 was frequently misused to dismiss elected State governments. The Court's landmark judgment in *S.R. Bommai vs Union of India* placed important limits on that practice. The challenge today is subtler: governments may remain in office, yet, governance itself may become hostage to political alignment.

Structural reform needed

What is needed is not merely judicial intervention, but structural reform. The Finance Commission's recommendations could be made more binding. A fixed statutory timeline, say, three months, could be prescribed for Governors to act on Bills, failing which assent would be deemed granted. Inter-State/governmental councils, already provided for under Article 263, could be revitalised as genuine forums for cooperative federalism rather than ceremonial gatherings. These are not radical proposals; they are logical completions of the constitutional architecture that the framers intended.

Political slogans will continue to animate election campaigns. But a slogan that implicitly threatens citizens with slower development if they choose the "wrong" party at the State level does not merely distort electoral choice; it corrodes the constitutional promise of equal citizenship. Development cannot depend on political alignment. It must rest on rules and institutions that treat every State, and every citizen, with equal fairness. That constitutional balance, not the number of engines pulling the same train, is the only engine India's federal democracy truly needs.

Fairness, not political alignment, must guide India's federal balance



GS Paper II – International Relations

Trump's Section 301 weapon, lessons from the past

Within hours of the February 20 ruling of the United States Supreme Court that U.S. President Donald Trump lacked authority to impose his infamous reciprocal tariffs, the U.S. administration invoked Section 122 of the Trade Act of 1974 to impose a 10% temporary surcharge on imports, effective February 24 to July 24, 2026. Section 122 requires the existence of a "balance of payment" (BOP) crisis. This has already been challenged by 24 U.S. States in the United States Court of International Trade, on the ground that, like the preceding tariffs, these too have no legal basis, nor is there any BOP crisis facing the U.S.

Under World Trade Organization (WTO) rules of international trade, import restrictions, not tariffs, are permissible in limited situations involving serious BOP difficulties, which could arise due to actual or any imminent threat of serious decline in a country's monetary reserves. None of these situations exists for the U.S.

In any event, since the Section 122 tariffs have a limited 150-day shelf life, Mr. Trump promised "other tools" and initiated two sets of "Section 301" proceedings – one alleging "Structural Excess Capacity and Production in Manufacturing Sectors", and another alleging "Failure to Impose and Effectively Enforce a Prohibition on the Importation of Goods Produced with Forced Labor". India is listed in both proceedings, along with the European Union (EU), Japan, Singapore, South Korea, China and many others. The factual and economic rationale for both, at best, is specious.

Furthering unilateral action

Section 301 sits under "Title III" of the U.S. Trade Act in the chapter "Enforcement of United States Rights under Trade Agreements and Response to Unfair Trade Practices". Section 301 authorises the Office of the United States Trade Representative to investigate foreign trade practices and impose unilateral tariffs based on a determination that such practices are



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The Section 301 proceedings demand action from India and other developing nations to revive multilateral rules

unjustifiable, discriminatory, or restrict U.S. commerce, or violate trade agreements.

A clear anomaly in Section 301 is that it provides the U.S. the right to unilateral determination of what is governed by rules of international trade. To state the obvious, one cannot be the judge of one's cause. To address this, soon after the WTO came into being in 1995, the EU initiated a dispute against the U.S. arguing that because Section 301 provides unilateral rights to the U.S. without any assessment of its international obligations, such a provision violated WTO law.

The WTO disputes panel agreed that even the threat of conduct prohibited by the WTO would enable one country to exert undue leverage on others. It compared Section 301 to a "big stick", that, merely by being carried could be "as effective a means to having one's way as actually using the stick".

The panel, however, refrained from holding Section 301 as illegal based on an assurance from the U.S. administration that it would render determinations "in conformity" with its WTO obligations. This deference to the U.S. was predicated on the U.S.'s standing by that assurance. That deference has today come to haunt WTO members.

Now, key decimator

A 2020 report of the U.S. Congressional Research Service (CRS) notes that until the start of the Trump administration (in 2016), the U.S. stood by its word and used Section 301 primarily to build cases and pursue dispute settlement at the WTO. The report acknowledges that the Trump administration changed that and started using Section 301 as a weapon to impose tariffs as punitive measures. Pursuant to Section 301 proceedings against China in 2017, unilateral tariffs up to 25% were imposed. A WTO panel held in 2020 that these tariffs violated the U.S.'s commitments under the WTO. The U.S. did not blink and appealed the panel ruling to the WTO's

appellate process. The only catch was that there was no WTO Appellate Body by 2020, since the U.S. had, single-handedly, blocked its constitution.

The U.S., as the chief architect of the WTO, including its enforceable dispute settlement mechanism, has been its chief decimator. Had the panel in 1999 ruled that Section 301 required amendment to ensure WTO consistency, the U.S. – then a trustworthy member of the multilateral system that it had helped create – would very likely have amended the section to eliminate any possibility of unilateral tariff imposition. And Mr. Trump's toolkit would have fallen short of one potent weapon.

The issue of trade agreements

Events over the past year have especially demonstrated the fragility of multilaterally agreed rules, and the significant systemic leverage the U.S. has been able to exercise by unabashed violation of those rules. And yet, we are also seeing some limits to that leverage. Malaysia has officially called its reciprocal trade agreement with the U.S. "null and void" after the U.S. Supreme Court's decision. Unlike Malaysia, India had not yet signed an agreement with the U.S., and the government has indicated that it hopes for a "mutually beneficial trade agreement". The pressures of the Section 301 proceedings will, no doubt, play a role in the conclusion of any negotiation.

Indian businesses need to actively participate in both Section 301 proceedings and make clear submissions exposing the absurdity of these so-called investigations. At the broader level, the core challenge for India and other developing countries is the need to revive multilateral rules. There is no substitute for the strength that comes from coalition-building to dilute the U.S.'s raw power advantage. India must step up and play that role.

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GS Paper II – Polity

Digital exile

The government could be creating a system of arbitrary censorship

A decade-long trend in digital governance in India crescendoed last week when a slew of social media accounts operated by independent activists and journalists were blocked apparently for criticising the Union government and Prime Minister Narendra Modi over his government's West Asia policies and the LPG crisis. In seven years, from 2014 to 2021, the number of URLs, posts, and accounts blocked ballooned from 470 to 9,800; since then, there is evidence that entire accounts, especially if they were publishing politically unfavourable comments, were being blocked. There was a wave of censorship during the farmers' protest in 2020-21; the government restored many accounts after international outcry but this also demonstrated that it was not beyond mass censorship. Similarly, the government used emergency powers under the IT Rules to block links to a BBC documentary in 2023, which also expanded the definition of what constituted a "threat to public order". But when Twitter (now X) challenged several blocking orders, between 2021 and 2022, in the Karnataka High Court, the High Court dismissed the plea and fined Twitter, further emboldening the state to censor accounts.

In *Shreya Singhal* (2015), the Supreme Court of India upheld Section 69A of the IT Act 2000 precisely because of its procedural safeguards, including requiring reasoned orders and judicial review. In practice, however, the government has been diluting the safeguards through an expansive use of Rule 16 of the 2009 Blocking Rules, which requires blocking proceedings to be confidential. When this stipulation is invoked to withhold blocking orders or their reasons from affected parties, it undermines their ability to challenge the action in court, eroding the very safeguards that justified the constitutionality of Section 69A. The 2009 Rules also require blocking orders to be reviewed by a committee composed under the IT Rules 2009, yet this is an entirely executive body and has never overturned a government blocking order. In effect, the government is openly and systematically bypassing the right to be heard and violating the doctrine of proportionality. Rule 16 is a procedural rule, yet the government is using it to override the constitutional right to free speech while shielding itself from judicial review. A person's entire account being blocked amounts to a digital exile, removing the person from the public square, which is a hallmark of an authoritarian government rather than of a liberal democracy. The government's plan to decentralise blocking powers to multiple Ministries could effectively create a regime of arbitrary censorship, where any department can silence a critic without the specialised oversight, however flawed, of the IT Ministry.



GS Paper III – Science & Technology (Health)

India must use the AYUSH opportunity

The 2026-27 Union Budget and India's new Free Trade Agreement (FTA) with the European Union (EU) signals Ayurveda's ambitious leap into the global mainstream. The Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homoeopathy (AYUSH) Ministry's budget has nearly doubled in the past five years, reaching ₹4,408 crore this year. Further, Finance Minister Nirmala Sitharaman has announced three new All-India Institutes of Ayurveda, aiming to set top standards for traditional medicine, similar to how AIIMS leads modern medicine in India. These institutes will not just treat patients, they will teach and conduct advanced research as well. The Budget also turbo-charges the National AYUSH Mission, raising its funding by 66% to modernise dispensaries, establish AYUSH clinics inside government hospitals, and upgrade drug-testing laboratories.

Together, these measures reflect an effort to bring traditional medicine into the mainstream health ecosystem rather than treat it as an alternative silo.

Global reach

If the Budget gives Ayurveda depth within India, the India-EU FTA gives it global reach. In EU countries that don't specifically regulate traditional medicine, the trade deal allows Indian AYUSH practitioners to provide their services using qualifications obtained in India. It guarantees that Indian companies can open Ayurvedic clinics across Europe without the fear of sudden policy reversal. It also sets up a system where Indian safety certifications could eventually be accepted in Europe, which means that products approved in India might not need extra testing.

However, this policy is also a moment which will test whether the country can merge faith in heritage with the discipline of evidence. For this is not just an economic expansion; it is a



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structural repositioning of Ayurveda within India's health system and the global market. When the alternative moves from local clinics to international markets, it enters regulatory and scientific arenas that demand proof. These treatments, understood as Traditional, Complementary, and Alternative Medicine (TCAM), will be evaluated within stringent regulatory and vigilance frameworks. This is precisely the moment when regulatory harmonisation becomes essential. If AYUSH products are to circulate in EU markets, they must meet international standards of safety, manufacturing quality, and claims regulation. Global ambition demands scientific accountability.

Need for scientific evidence

If claims outpace evidence, India risks legal disputes, reputational damage, and the reinforcement of stereotypes about 'unscientific traditionalism.' For Ayurveda and other AYUSH systems to enter the global mainstream credibly, they must submit to rigorous, independent, and transparent scientific evaluation conducted by third-party research organisations. At present, many assessments are funded, designed, or overseen by the same Ministry that promotes AYUSH, creating a structural conflict of interest. Global credibility requires independently funded clinical trials, transparent methodologies, peer-reviewed publications, and the willingness to publish negative findings.

A common defensive move in debates around traditional medicine or cultural knowledge is to frame scientific scrutiny as colonial bias or Western epistemic dominance. Certainly, the history of colonial medicine in India involved the marginalisation and delegitimisation of local systems of healing. While that history should not be forgotten, it does not follow that all demands for empirical evaluation are acts of epistemic domination. Demanding evidence is not cultural betrayal, and

scientific evaluation does not diminish tradition.

Coexisting systems

Furthermore, TCAM systems endure not simply because of cultural loyalty, but because they carry different imaginations of the body, health, and illness. To engage with TCAM seriously is to recognise that they are not merely collections of remedies but coherent epistemologies. Systems such as Ayurveda are organised around ontological commitments about what the body is, how it is constituted, and how disorder emerges. The body in Ayurveda, for instance, is not a collection of discrete organs but an interdependent system embedded in environment, diet, season, and social life. Health is a state of equilibrium across physiological, psychological, and ecological registers, and illness is a disturbance in patterned relations rather than a discrete lesion.

This stands in contrast to modern medicine, which has historically been grounded in anatomical localisation. Biomedicine excels at identifying specific causal mechanisms and intervening with precision at targeted sites. TCAM systems, by contrast, often operate through systemic logics. But the question is not biomedicine versus TCAM. The conceptual frames in TCAM do not need to replace biomedicine to be valuable. They can function as counterpoints that expand questions about what it means to be healthy. They offer alternative models of embodiment – models in which the body is ecological and dynamic.

Thus, the goal is not substitution but dialogue. In that dialogue lies the possibility of strengthening scientific inquiry across the spectrum of care. Therefore, public investment should fund intellectual openness and scientific freedom. Global ambition will be sustained not by assertion, but by evidence, transparency and the courage to be rigorously examined.

For Ayurveda and other AYUSH systems to enter the global mainstream credibly, they must submit to rigorous, independent, and transparent scientific evaluation



GS Paper III – Science & Technology

India's dual dependence on West Asia for urea production

Data indicate that the West Asian conflict threatens both domestic urea production and the stability of its global supply chain

DATA POINT

Nitika Francis

The ongoing conflict in West Asia has disrupted global trade, leading to LPG shortages and a surge in crude oil prices. Data show that the crisis could also affect India's supply of Liquefied Natural Gas (LNG), putting at risk the production of urea, a key fertilizer in the country's major agrarian economy.

The conflict has already started to impact India's urea supply. As of Sunday, industry sources told PTI that the country's urea plants are running at half capacity, with Petronet LNG Ltd, which operates India's largest liquefied natural gas receiving terminal, declaring force majeure amid disruptions to cargoes. The move triggered supply curtailments by state-owned gas distributors GAIL (India) Ltd, Indian Oil Corporation Ltd and Bharat Petroleum Corporation Ltd.

India is heavily dependent on imports for its LNG supply, exposing many of its sectors to global shocks such as the U.S.-Israel attacks on Iran. Data show that in 2025, India bought more than 50% of its natural gas from the international market (Chart 1). In fact, India is the fourth largest buyer of natural gas in the world, with an imported supply of 261 lakh metric tonnes in 2025.

A majority of these imports – more than 40% of it – are tied to long-term contracts with suppliers in Qatar (Chart 2). This supply may be in jeopardy as Qatar's LNG cargoes pass through the Strait of Hormuz, which has now become a central chokepoint in the Iran-Israel conflict. The UAE and Oman also ship LNG along this route, and both countries contribute to India's imported LNG supply. Overall, more than 60% of India's imported LNG could be affected by the closure of the Strait.

In India, natural gas is primarily used to produce ammonia, which

in turn is used to produce fertilizers. In FY26, about 30% of India's LNG supply was used for the production of fertilizers (Chart 3). Demand also comes from industry and gas-fired power and city gas networks which supply to households and vehicles.

LNG is the main feedstock for the production of urea, which is the most widely used fertilizer in India. Many urea plants use naphtha or fuel oil – both derived from crude oil – as their main input. However, as urea production is a highly energy-intensive process, these plants have switched to natural gas, which produces fewer emissions.

National urea consumption hit 387 lakh metric tonnes in 2025, following a decade of steady growth. While domestic production has also been increasing (India produced about 306 lakh metric tonnes of urea in 2025), it does not cover the country's demand. Due to this, India also relies on imports of urea.

Data indicate that the West Asian conflict threatens both domestic urea production and the stability of its supply chain. In 2025, India's urea imports exceeded 2,300 lakh metric tonnes, with a staggering 71% of these imports coming from West Asia (Chart 4). This total comprises 45% from Saudi Arabia, Qatar, and the UAE, all of which rely on the Strait of Hormuz for transit.

Amidst this scenario, the Government of India issued the Natural Gas (Supply Regulation) Order, 2026, officially including the fertilizer sector in its priority list.

The government also stated that as of March 10, India's urea reserves have reached 61.51 lakh metric tonnes, about 10 lakh more than last year, ahead of the Kharif sowing season. However, only time can tell if India's import dependence for both domestic production and global supply trade will weather the ongoing geopolitical instability.

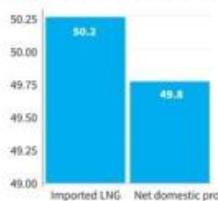


Distressed supply: A farmer sprinkles fertilizer on a paddy field in the Nagaon district, Assam

Crop hazard

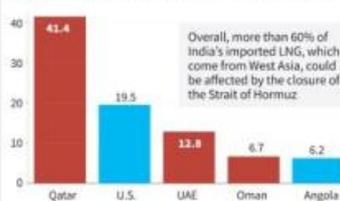
The data for the charts were sourced from the Ministry of Trade and Commerce, the Department of Fertilizers, and the International Gas Union

Chart 1: The composition of India's LNG supply in 2025-26 (in %)



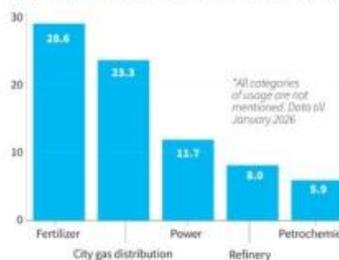
India is the fourth largest buyer of natural gas in the world, with an imported supply of **261 lakh metric tonnes** in 2025

Chart 2: Country-wise share (%) of India's LNG imports in 2024-25



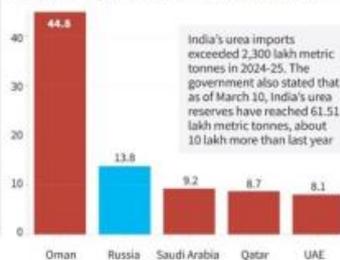
Overall, more than 60% of India's imported LNG, which come from West Asia, could be affected by the closure of the Strait of Hormuz

Chart 3: The distribution of LNG use in India in 2025-26 (in %)



*All categories of usage are not mentioned. Data till January 2026

Chart 4: Country-wise share (%) of India's urea imports in 2024-25



India's urea imports exceeded 2,300 lakh metric tonnes in 2024-25. The government also stated that as of March 10, India's urea reserves have reached 61.51 lakh metric tonnes, about 10 lakh more than last year

- 1 Industry sources said that the country's urea plants are running at half capacity
- 2 Natural gas is used to produce ammonia, which in turn is used to produce fertilizers
- 3 LNG is the main feedstock for the production of urea, which is the most widely used fertilizer in India
- 4 Chart 3 and 4 only include the top 5 exporting countries



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GS Paper III – Science & Technology

How agriPV can turn India's farms into dual-purpose powerhouses

India's ambitious energy transition goals – to have 300 GW of installed solar capacity by 2030 and achieve net-zero emissions by 2070 – put land at a premium, and utility-scale solar projects require large tracts of land while agriculture is already under pressure from competing land use; agri-photovoltaics can ameliorate this conflict

Shantanu Roy

In the 2026-27 Budget, the outlay for the PM-KUSUM scheme nearly doubled to ₹5,000 crore, signalling the government's renewed emphasis on increasing solar power production centred on India's farmers. Specifically, the scheme aims to provide energy and water security to farmers, enhance incomes, and decarbonise the farm sector through decentralised solar pumps and power plants.

But as the scheme evolves, India also faces a question: how can solar be expanded on agricultural land without compromising food security?

Agri-photovoltaics (agriPV) is emerging as a promising answer to this question. AgriPV integrates solar systems with farming, allowing farmers to generate electricity and cultivate crops on the same parcel of land. The panels are mounted at a suitable height to allow farm operations below, and are spaced between crop rows or integrated into greenhouses to minimise conflict between agricultural production and energy generation.

Selecting right crops

The designs vary by crop and region. Elevated systems have panels mounted a few metres above ground to allow crops to grow below. Row-based systems have panels positioned between crop rows to minimise shading. Vertical systems use upright panels that can capture sunlight from both sides. Greenhouse-integrated systems feature solar panels on roofs or walls to maintain a controlled growing environment. The suitability of a design also depends on the local climate, irrigation practices, and the crop. So systematic and region-specific planning is essential to optimise both agricultural and energy yields.

Careful crop selection is also key to the success of agriPV systems because the amount of sunlight available changes based on how solar panels are placed. Shade-tolerant crops generally perform well in partially shaded areas under solar panels while crops that need more sunlight grow better in the spaces between rows of panels.

Crop selection also varies across India's diverse agro-climatic regions. For instance, suitable crop options include tomato, onion, garlic, turmeric, ginger, leafy vegetables, and tuls in Madhya Pradesh, and ragi, jowar, grapes, tomato, potato, chillies, banana, and brinjal in Karnataka and Maharashtra – all of which can perform well in agriPV systems.

Beyond technical considerations such as crop selection, the scalability of agriPV hinges on developing viable business models. Farmers can own and operate agriPV systems, use a portion of the electricity generated, and sell the surplus. With the help of Farmer Producer Organisations or cooperatives, multiple



Sheep graze under rows of solar panels on a farm. Representative image. PUBLIC DOMAIN

farmers can also aggregate land and collectively develop projects, enhancing their bargaining power and access to finance.

Private developers could also lease farmland and share revenues or pay fixed rents to farmers. Alternatively, State governments or public agencies could develop agriPV systems to support local energy needs.

Why agriPV matters for India
India's ambitious energy transition goal – to have 300 GW of installed solar capacity by 2030 and achieve net-zero emissions by 2070 – put land at a premium. Utility-scale solar projects require large tracts of land while agriculture is already under pressure from competing land uses.

AgriPV can ameliorate this conflict. With more than half of India's land under agriculture, dual-use deployment is valuable. And in an economy that depends heavily on agriculture, the technology's appeal lies in both farmers diversifying their incomes and producing clean energy. Farmers can earn from selling electricity, leasing land or sharing revenues while continuing to cultivate.

AgriPV also delivers environmental co-benefits. In certain agro-climatic conditions, partial shading can reduce evapotranspiration – the combined loss of water to the atmosphere through evaporation and plant transpiration – and soils retain more moisture, thus enhancing the overall water-use efficiency. Solar panels can also protect crops against extreme heat, rainfall, and hail. By lowering the farm's need for diesel, such systems can also support

AgriPV's large-scale adoption in India faces economic, regulatory, and institutional barriers, which include high capital costs, lack of regulatory clarity and lack of design benchmarks

rural entrepreneurship and local economic growth. AgriPV can power ancillary services as well, including cold storage, food processing units, and chaff cutters, strengthening rural value chains. However, this requires clear governance frameworks, tariffs, and accessible finance.

Status in India

There are around 50 pilot agriPV installations nationwide, with various panel-crop combinations and economic feasibility under evaluation. Recent policy discussions have also increasingly referenced agriPV but large-scale replication has yet to commence. Both policymakers and experts need more empirical evidence across agro-climatic zones to say which configurations, crop matrices, and financial frameworks are most suitable.

The technology's large-scale adoption in India does face economic, regulatory, and institutional barriers. Elevated structures and specialised mounting systems significantly increase capital costs, well above those of conventional solar systems. A crop's responses to shading can vary and poorly designed systems may even reduce agricultural yields.

System ownership between farmers

and developers could also raise doubts, particularly if long term land rights and revenue-sharing arrangements are not fully clear. Land classification, grid connectivity, and tariffs hinge on regulatory clarity and the lack of design benchmarks adds to investor uncertainty.

Policy pathways

With the right policy support, agriPV has the potential to scale beyond pilot projects. Recent consultations on PM-KUSUM 2.0 have indicated that the government may include agriPV in a proposed 'National Agri-photovoltaics Mission' as a dedicated 10-GW component, with viability gap funding to offset the capital costs. Such measures could remarkably improve the bankability of agriPV projects and reduce the financial risk. Clearly recognising dual-use configurations within PM-KUSUM 2.0 could help align agriPV with farmer-centric solarisation. States can reinforce this by identifying suitable clusters, streamlining approvals, and integrating agriPV into farmer training and advisory programmes.

As India rapidly advances in its energy transition, agriPV offers a pathway for renewable energy to complement agricultural productivity. Its inclusion under PM-KUSUM 2.0 could move it from scattered pilots to a more structured, scalable model, strengthening farmer incomes and easing land pressures.

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THE GIST

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