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The next farm reform must protect India's harvest



ANKUR
AGGARWAL

As India marks Reforms Utsav, celebrating 12 years of governance reforms under the leadership of the Hon'ble Prime Minister Shri Narendra Modi, agriculture stands out as a major success. The Government's farmer-first approach has focused on raising incomes, reducing cultivation costs, strengthening risk protection and bringing modern infrastructure and services from farm to market. Direct benefit transfers, crop insurance, institutional credit, irrigation, digital markets, farm infrastructure, soil health, mechanisation and technology-enabled advisories have together improved the operating environment for farmers.

The results are visible. India's total foodgrain production is estimated at 376.56 million tonnes in 2025-26, the highest ever in the country's history. Agricultural exports, which stood at USD 32.08 billion in FY 2014-15, are projected to reach a record USD 52.55 billion in FY 2025-26. Recent GST rationalisation has also supported this direction by reducing rates on tractors below 1800 cc, several bio-pesticides, micronutrients and other farm-linked inputs. On the farm advisory side, initiatives such as the National Pest Surveillance System and Bharat-VISTAAR are helping improve pest intelli-

gence and decision-making. These initiatives are laying the foundation for an integrated ecosystem where production, pest surveillance and market access are increasingly interconnected.

This is why crop protection should become a central part of the next phase of reform. A country producing and exporting at record levels needs a modern system to protect crops and preserve its competitive edge in global markets. Crop protection sits at the intersection of productivity, farmer income, food safety and export readiness. A pest outbreak can reduce yield. The wrong product or improper application can jeopardise residue compliance. A spurious input can damage the farmer's crop and weaken trust across the value chain.

These pressures are intensifying. Climate variability is changing pest behaviour and infestation windows. A study published in Science estimated that for wheat, rice and maize, yield losses from insect pests could increase by 10-25% for every degree Celsius of warming. Official estimates placed before Parliament suggest that pests, diseases and weeds account for about 10-35% of annual crop losses in India, depending on the crop and season. Separately, a CropLife India and YES Bank knowledge report estimates that nearly 72 lakh crore worth of crop yield is lost annually due to pests.

Pests are creating a market-access challenge as well. The EU RASFF system, the US FDA import refusal system and APEDA's export advisories show that residue compliance has become a recurring concern across high-value markets. APEDA's advi-



sory on rice exports to Lebanon illustrates how quickly residue-related concerns in one market can influence requirements elsewhere. Assam tea faces a similar challenge, with reports warning that tighter European residue limits could affect around 40 million kg of high-end Assam tea exports to Europe and the UK.

India's response must begin at the production stage. Compliance depends on farmers knowing which product is approved for which crop, how long the crop must wait before harvest. Integrated Pest Management must become more central in practice. Surveillance, correct diagnosis, economic thresholds, resistant varieties, field hygiene and responsible use of crop protection products all have a role. Better pest management is ultimately about correct use, not more use.

Access to a wider basket of crop protection technologies enables farmers to choose the most effec-

tive solutions for their crops and pest pressures. Yet India has only around 380 registered molecules, compared with nearly 1200 available globally, limiting access to newer tools needed to manage resistance, improve productivity and meet evolving export standards. One reason for this gap is the absence of Protection of Regulatory Data (PRD) in India. A well-designed PRD framework can encourage innovation and facilitate faster access to newer, more selective and lower-dose crop protection solutions with improved stewardship practices. When used in accordance with approved labels and Good Agricultural Practices, these technologies can help farmers manage pests pressure more effectively, optimise spray intensity and better align with the increasingly stringent residue requirements of international markets. At the same time, farmer training, adherence to approved uses and pre-harvest intervals, along with robust testing and traceability systems, remain critical for ensuring compliance with prescribed Maximum Residue Limits (MRLs). Major agricultural economies, including the EU, the US and China, provide time-bound regulatory data protection to encourage innovation. India too can design a calibrated framework for new molecules that promotes earlier access to advanced technologies while preserving competition through independent data generation and eventual generic entry. Such a model would benefit farmers today and expand opportunities for domestic manufacturing and exports over time. Reforms Utsav should be seen not as the culmination of agricultural reforms, but as a call for the next phase. India has strengthened its

production base, built export-oriented systems and embraced digital agriculture. Crop protection regulation must now keep pace with this transformation. A Protection of Regulatory Data (PRD) framework can accelerate access to newer crop protection technologies and enhance the competitiveness of Indian agriculture. The proposed Pesticides Management Bill, 2025 presents a timely opportunity to provide the regulatory foundation for this transition by replacing the framework established under the Insecticides Act, 1968. Its focus on digitisation, stronger action against spurious products, improved compliance and enhanced regulatory oversight is a welcome step. To serve farmers in the next decade, the legislation should also enable faster registration pathways for innovative molecules, lower-risk products and new uses, alongside greater emphasis on label expansion for export-oriented and minor crops. As global markets become more demanding, these reforms are essential to protect yields, raise farm incomes and reinforce India's position as a trusted supplier in global agricultural trade.

The next milestone should be an ecosystem where crop protection decisions are guided by science, traceability, timely advice and access to modern tools, all geared towards improving outcomes for farmers. That is how India can secure farmer incomes, enhance food safety and build high-value agricultural exports that meet the standards of increasingly discerning global markets.

The writer is agriculture-policy analyst, writes on agro, issues, policies and reforms

भारतीय कृषि किस प्रकार खाद्य के अभाव से खाद्य-अतिरेक स्तर तक रूपान्तरित हुई है ? भारतीय कृषि के विविधीकरण हेतु की गई विभिन्न सरकारी नीतियों का वर्णन कीजिए। (उत्तर 250 शब्दों में दीजिए)

How Indian agriculture has been transformed from food scarcity to food surplus level ? Explain the various government policies implemented for diversification of Indian agriculture. (Answer in 250 words)

1. The next farm reform must protect India's harvest

Source: Daily Pioneer | GS: GS-III — Agriculture, Food Security, Farm Reforms

Context

India's farm reforms have focused largely on **raising agricultural productivity and farmer incomes**. However, these gains can be undermined by crop losses from pests and diseases, changing pest patterns due to climate change, inappropriate pesticide use and increasingly stringent global food-safety standards. The article argues that **crop protection must become a central pillar of the next phase of farm reform**.

Mains Perspective — Analytical Takeaways

1. The Problem — Producing More is Not Enough

- Higher production does not necessarily translate into higher farm income if crops are subsequently damaged by **pests, diseases and climate-related stresses**.
 - Climate change is altering pest behaviour and disease patterns, making crop losses more unpredictable.
 - Inappropriate pesticide use can increase cultivation costs while creating **residue and environmental concerns**.
 - Hence, farm reform must move beyond increasing output towards **protecting the value of what is produced**.

2. Existing Crop-Protection System Needs Greater Access to Innovation

- India has around **380 registered pesticide molecules**, compared with nearly **1,200 globally**, indicating a significant gap in access to newer crop-protection technologies.
 - Farmers therefore need greater access to **newer, safer, selective and effective products**, particularly as pest pressures evolve with climate change.
 - At the same time, simply increasing pesticide use is not the answer; the emphasis should be on **scientific and need-based crop protection**.

3. Reform through Integrated Pest Management

- **Integrated Pest Management (IPM)** should become central to the reform approach by combining pest surveillance, correct diagnosis, resistant varieties, field hygiene, economic thresholds and judicious pesticide use.
 - This can reduce unnecessary chemical application while controlling crop losses and lowering the risk of pesticide residues.
 - The approach therefore links **productivity, farmer income, environmental sustainability and food safety** rather than treating them as separate objectives.

4. Crop Protection is also an Export Reform

- Increasingly stringent international **pesticide-residue standards** mean that crop protection directly affects India's agricultural export competitiveness.
 - Different **Maximum Residue Limits (MRLs)** across major markets such as the European Union, United States and China can create compliance challenges for Indian agricultural exports.
 - India therefore needs stronger **residue testing, traceability, farmer awareness and compliance mechanisms** so that higher agricultural production translates into greater export value.

5. Pesticides Management Bill, 2025 — Regulatory Reform for the Next Phase

- The proposed **Pesticides Management Bill, 2025** is intended to modernise India's pesticide-regulation framework and strengthen oversight.
- A key requirement is stronger action against **spurious products**, while ensuring that farmers can access newer crop-protection technologies.
- **Protection of Regulatory Data (PRD)** can encourage innovation and investment in newer crop-protection products.
- The reform must therefore strike a balance between **innovation, accessibility, quality control, farmer safety, consumer safety and environmental protection**.

Prelims Important Terms

- 1. Integrated Pest Management (IPM):** An approach combining preventive, biological, agronomic and judicious chemical methods to manage pests sustainably.
- 2. Maximum Residue Limits (MRLs):** Permissible levels of pesticide residues in agricultural/food commodities; compliance is important for food safety and exports.
- 3. Protection of Regulatory Data (PRD):** Protection relating to regulatory data submitted for approval of crop-protection products, intended to encourage innovation and investment.

Delhi can't afford to lose Dhaka connect

PM Modi has done well by absorbing Tarique Rahman's Sheikh Hasina tantrum



THE GREAT GAME

JYOTI MALHOTRA

BANGLADESH'S new President, the once Left-leaning Mirza Fakhrul Islam Alamgir, was all of 23 years old back in March 1971, at home in Thakurgaon in northern East Pakistan, when he heard that Pakistani military officers had unleashed Operation Searchlight all over the country and were massacring unarmed Bangladeshi nationalists, intellectuals and politicians. Two days later, on March 27, Alamgir and friends heard Major Ziaur Rahman, a serving Major in the Pakistan Army, give the rousing call for an independent Bangladesh over radio, on behalf of Sheikh Mujibur Rahman, from his hideout in Chattogram (then Chittagong) — a message that was picked up by BBC and Radio Australia and relayed across the world.

"Joy Bangla!" said Major Zia as he ended his speech, unleashing for the first time a cry that would transform into a freedom chant in the coming weeks and months — admired by celebrities as diverse as Indira Gandhi and George Harrison, and equally disliked by Yahya Khan and Henry Kissinger — rallying the entire nation to join hands with India and forge the Mukti Bahini, which would lead by the end of the year to the India-Pakistan war and the liberation of Bangladesh.

As the situation deteriorated in April 1971 in Thakurgaon — named for a Chakraborty family with large lands, with a twin town called Thakurganj only 55 km away, across the border in Kishanganj district of Bihar — Alamgir and his family crossed the Nagar river into India's West Dinajpur district, part of a swelling flood of refugees. There, in Islam-



OUTREACH : If the Dhaka elite is to be believed, Bangladesh President Mirza Alamgir (right) has advised PM Tarique Rahman to travel to Delhi for a meeting with PM Modi. PTI AND REUTERS

pur, a cycle repair shop man called Dilip allowed the family of seven to sleep in a room behind an almshouse. Jyoti Basu's West Bengal and Karpooi Thakur's Bihar offered clothes to the refugees and "training" to able-bodied men in youth camps. Weeks later, Indira Gandhi's government got properly involved and Alamgir, amongst others, received "training" in earnest in Dehradun.

More than 55 years later, if the Dhaka elite is to be believed, senior Bangladesh Nationalist Party (BNP) leader and now President Alamgir has advised Prime Minister Tarique Rahman, son of the selfsame Major Zia whose cry of "Joy Bangla" electrified the world — and gave its name to many things, including the contagious fevers then sweeping India as a result of the hundreds of refugee camps set up across the Bengal-Bihar-Tripura-Assam borderlands — that he should travel to Delhi to meet Prime Minister Modi, notwithstanding the Sheikh Hasina brouhaha.

Alamgir is believed to have pointed out that one woman, Sheikh Hasina, even if she was Bangabandhu's daughter with whom India continued to have the closest ties, cannot hold the India-Bangladesh relationship hostage.

The sky must be the limit between India and all her neighbours, from the Karakoram to Cox's Bazar.

That the 1971 War of Liberation remained an umbilical cord between the people of both countries, not just between leaders.

For the time being, though, Tarique's proposed August 23-25 visit has been postponed, as both sides sort out the nitty-gritty. But the significance of PM Modi's conciliatory message, in the wake of Bangladesh hardening its stance last week and making Tarique's visit to India conditional on the extradition of Hasina, has not been lost on Dhaka.

It needed the PM to make that overture — come, we will give you an "honourable reception", he said in a message to Tarique, keenly aware that Sheikh Hasina's August 5 press conference had seriously upset him.

Modi understood quickly that only he could save the situation. That Bangabandhu's daughter,

a VVIP who could do no wrong because her father had helped India break up Pakistan, could not be allowed to hijack the relationship. That the world had changed. That Bangladesh was again swimming in a dangerous sea, surrounded by sharks with names like China and Pakistan. That Tarique's first visit as PM had been to Beijing and Kuala Lumpur, not Delhi. That the Bangladeshis, after all these decades, were being wooed by the military establishment in Rawalpindi — that Dhaka was crawling, once again, with ISI spies.

Certainly, the PM knows that India's eastern flank needs protecting — that it remains not just the gateway to South-East Asia, but is key to security in India's eight North-East states; Bangladesh shares common borders with five Indian states; last time there was a BNP government in power, 2001-2006, when Tarique's mother Khaleda Zia was PM, a huge arms haul in Chittagong was seized just in time.

There's also the realisation that India's neighbourhood is in a bit of a churn. Pakistan remains in deep freeze, despite pleas by senior RSS leaders like Mohan Bhagwat and Dattatreya Hosabale to repair ties. Nepal's PM has final-

ly met the Indian ambassador, but continues to mutter threateningly about China. Bhutan, Sri Lanka and Maldives are quiet, but China's shadow looms large. Certainly, India cannot afford to lose Bangladesh. It must find ways to revamp the old connect.

The one big difference between 1971 and 2026, of course, is that India's hugely improved tie with the US has meant that India works much more closely today with the Americans in all parts of its neighbourhood, not just in Bangladesh — back in 1971, the US and Pakistan were a cinch. The rest of the story doesn't need retelling.

Perhaps, PM Modi should take a leaf out of how big powers like the US and China play the game, both hedging and reaching out to smaller powers at the same time. India's unique civilisational strength, meanwhile, demands that it punch much above its economic weight, especially in its neighbourhood, where ties are weighted down by language, religion, culture and ethnicity, imparting a continuum to the ends of India.

That's why PM Modi has done well by absorbing Tarique Rahman's Sheikh Hasina tantrum, and for the time being, putting it on the backburner — where it will be definitely resolved soon, a probable quid pro quo being that when she returns home to Bangladesh in December, which she has publicly promised to do, no harm will be allowed to come to her person and that of her family — and foregrounding the all-important tie between Delhi and Dhaka.

That's why the sky must be the limit between India and all her neighbours, from the Karakoram to Cox's Bazar — India First, yes, on the part of the neighbours, but also Neighbourhood First, on the part of India, signifying both an open wallet and an open heart. Certainly, a neighbourhood as diverse as this one is no child's play. Restoring trust will take time. With the 'Arthashastra' by his side, the PM has taken the first move with Bangladesh. He must now steer the course.



2. Delhi can't afford to lose Dhaka connect

Source: The Tribune| GS: GS-II — India and Its Neighbourhood

Context

India–Bangladesh relations have weakened in the **post-Sheikh Hasina phase**, particularly over her continued stay in India and Dhaka's extradition demand. With the **new government under Prime Minister Tarique Rahman**, India has an opportunity to reset ties while protecting its long-standing strategic interests.

Mains Perspective

I. Bangladesh's Importance for India

1. Strategic & Geographical Importance: Bangladesh shares a **4,096-km border** with India, adjoining **West Bengal, Assam, Meghalaya, Tripura and Mizoram**. Its location is crucial for the security and economic integration of India's North-East and provides access towards the **Bay of Bengal and Southeast Asia**, strengthening the Act East Policy.

2. Development Partnership & Economic Interdependence: India has extended around **US\$8 billion through Lines of Credit** for Bangladesh's infrastructure and development. Projects in railways, roads, ports and waterways serve Bangladesh's development needs while also advancing India's connectivity interests. Bilateral trade of around **US\$13.5 billion in FY 2024–25** further demonstrates substantial economic interdependence.

3. Connectivity, Energy & Security: The **Akhaura–Agartala rail link, inland waterways and access to Chattogram and Mongla ports** improve India's access to the North-East. Bangladesh imports **1,160 MW of electricity from India**, while the **1,320-MW Maitree Super Thermal Power Project** and Friendship Pipeline deepen energy cooperation. Security cooperation also helps address **insurgency, trafficking, smuggling and transnational crime**.

4. Regional & Multilateral Importance: Bangladesh is an important member of the **Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)** and a key partner in **Bangladesh–Bhutan–India–Nepal (BBIN)**. Its geographical position connects **South Asia, the Bay of Bengal and Southeast Asia**, making it important for India's wider regional integration and Act East objectives.

II. Challenges in India–Bangladesh Relations

1. Post-Hasina Political Tensions: Sheikh Hasina's continued presence in India and Dhaka's extradition demand have become major irritants. India now has to develop a working relationship with the **Tarique Rahman government** without allowing the Hasina issue to define the entire bilateral relationship.

2. Water-Sharing Disputes: India and Bangladesh share **54 transboundary rivers**. While the **Ganga Water Sharing Treaty, 1996** provides an institutional framework, the unresolved **Teesta issue** remains a persistent source of bilateral sensitivity.

3. Border Management: The long and densely populated border faces challenges involving **smuggling, trafficking, illegal movement and border incidents**. Effective cooperation is therefore required while also protecting the legitimate interests of border communities.

4. Trade & Market Access: Despite substantial bilateral commerce, **trade imbalance and non-tariff barriers** remain concerns. Greater market access, investment and value-chain integration are needed to make economic relations more balanced.

5. Security & Political Stability: Political instability, extremism or transnational criminal networks in Bangladesh can have direct implications for **India's North-East**. Continued security cooperation is therefore important irrespective of political changes.

6. China Factor: Growing Chinese economic and strategic engagement in Bangladesh creates competition for India's strategic space in the **Bay of Bengal and eastern neighbourhood**. India needs to remain an attractive partner through development cooperation, connectivity and economic opportunities.

7. Trust Deficit: Political rhetoric, border incidents and perceptions of unequal treatment can weaken public confidence. The historical, cultural and social links between the two countries therefore need to be strengthened beyond government-to-government relations.

III. Way Forward

1. Institution-Centric Diplomacy: India should move from a **leader-centric to an institution-centric relationship**, strengthening engagement with Bangladesh's government, political stakeholders and institutions so that political transitions do not destabilise bilateral ties.

2. De-link the Hasina Issue: The extradition question should be handled through **established legal and diplomatic channels**, preventing it from overwhelming cooperation in trade, connectivity, energy and security.

3. Resolve Outstanding Issues: Sustained dialogue should address **Teesta, other transboundary rivers, border management and trade barriers**, with emphasis on mutually acceptable and cooperative solutions.

4. Deepen Economic Interdependence: India and Bangladesh should expand **trade, investment, connectivity, energy cooperation and regional value chains**, creating stronger mutual stakes in stable relations.

5. Strengthen Regional Cooperation: India should use **BIMSTEC and BBIN** more effectively to advance connectivity, trade, energy, disaster management and sub-regional integration.

6. Rebuild People-to-People Trust: Greater cooperation in **education, culture, tourism and social exchanges** can strengthen the societal foundation of the relationship and make it more resilient to political changes.

U.S. imposes 50% import tariffs on \$20 bn worth of Canadian products

Prime Minister Mark Carney says Canada would match the U.S. tariffs 'dollar for dollar' to protect workers and businesses; while the U.S. side says Canada 'declined to finalise the trade deal', the latter blames 'last-minute changes' in the U.S. proposal

Associated Press
WASHINGTON

The United States imposed 50% tariffs on \$20 billion worth of Canadian products early Saturday, and Canada immediately said it would retaliate after last-ditch negotiations failed to resolve the latest strain in relations between the historic allies.

President Donald Trump's import taxes will hit about 5% of what Canada ships to the United States every year, including products ranging from hockey sticks to tongue depressors.

"Canada will match those tariffs dollar for dol-



Dominic LeBlanc, Canada's Minister in charge of U.S.-Canada trade, arrives at the Office of the USTR in Washington DC on Friday. AFP

lar to protect our workers and businesses," Prime Minister Mark Carney said in a statement. The retaliation escalates the trade conflict and calls into question the future of a North

American trade agreement covering the United States, Canada and Mexico that is crucial to industry in all three countries.

Canada had sought concessions on tariffs on steel,

aluminium, autos and lumber.

"Tonight, Canada declined to finalise the trade deal under the terms agreed earlier this week. Despite the U.S. offer to Canada to receive the best treatment of any major exporter to our market, new demands and walk-backs of other commitments by Canada have upended the careful balance reached in the past days," U.S. Trade Representative Jamieson Greer said in a statement.

Mr. Carney blamed the Republican administration for the breakdown, saying "last-minute changes in the U.S. proposed terms were unfair, uneconomic, and called into question the re-

liability of any deal". He said he had suspended negotiations and directed Canada's negotiating team to return to Ottawa.

Mr. Carney said his government would announce additional support for Canadian workers and businesses in the coming days.

Mr. Greer said the U.S. offer was "forward-looking" and included "a historic economic and national security partnership".

No further talks are planned.

The breakdown in negotiations marked a sharp reversal from two days earlier, when officials from the two countries sounded as if they were headed toward a compromise.

3. U.S. Imposes 50% Import Tariffs on Canadian Products

Source: TH | **GS:** GS-III — Economy, International Trade

Context

The United States has imposed **50% tariffs on around US\$20 billion worth of Canadian products** after last-minute negotiations between the two countries failed to produce a trade agreement.

Key Points

1. U.S. Tariff Action: The new tariffs will affect products imported from Canada, adding significantly to the cost of Canadian goods entering the U.S. market.

2. Canada's Retaliation: Prime Minister **Mark Carney** announced that Canada would respond with "**dollar-for-dollar**" tariffs to protect Canadian workers and businesses.

3. Areas of Impact: The dispute affects important sectors such as **steel, aluminium, automobiles and lumber**, increasing uncertainty for industries integrated across the U.S.–Canada border.

4. Breakdown in Negotiations: The U.S. said Canada declined to finalise the trade deal, while Canada argued that **last-minute changes in U.S. demands** made the proposed terms unacceptable.

5. Wider Significance: The escalation threatens the stability of the **U.S.–Canada–Mexico trade framework**, which is important for integrated North American industries and supply chains.

Doval heads to Beijing, boundary talks with Wang Yi tomorrow

NSA visit comes ahead of BRICS summit in Delhi next month

Shubhajit Roy

New Delhi, August 23

AHEAD OF a possible visit by Chinese President Xi Jinping to India for the summit of the BRICS leaders next month, National Security Advisor Ajit Doval is travelling to Beijing Monday for Special Representative-level talks on the boundary issue with his Chinese counterpart Wang Yi.

The 25th round of SR-level talks will be held Tuesday. Both Doval and Wang are the designated SRs for the boundary talks mechanism which was established in 2003 to comprehensively address the long-



NSA Ajit Doval is India's Special Representative for boundary talks with China

Doval on the sidelines. Wang, who is also China's Foreign Minister, underlined it is "imperative" for India and China to respect each other's "core interests" and take concrete actions to implement the "important consensus" reached by both sides.

The two countries have been moving to repair ties that plummeted after the military stand-off along the Line of Actual Control (LAC) in eastern Ladakh. Since late 2024, both sides have

Doval heads to Beijing, boundary talks with Wang Yi tomorrow

“quiet” and there had been an “upward trend” in bilateral ties.

Earlier this month, responding to a question on reports of some tension along the LAC, the Ministry of External Affairs said the state of the border with China will reflect on the state of the “larger bilateral ties” and that maintenance of peace and tranquillity along the LAC is of “utmost importance”.

Randhir Jaiswal, spokesperson for the MEA, also rejected China’s criticism of New Delhi identifying 27 places and features in Arunachal Pradesh by their standard names, maintaining that the state is an “inalienable and integral” part of India and nothing can change this “indisputable reality”.

This was reiterated at a meeting of the Working Mechanism for Consultation and Coordination on India-China Border Affairs (WMCC). “At this meeting, the two sides engaged

in frank discussions and reviewed the situation along the LAC,” Jaiswal said.

On Saturday, External Affairs Minister S Jaishankar, speaking on the situation with China, said: “I think we went through a particularly bad patch between the summer of 2020 and the autumn of 2024, and that was primarily an outcome of the situation in the border areas.”

“At the end of the day, peace and tranquillity in the border areas is a prerequisite for good relations, and the state of the border, to a very large measure, naturally would determine the state of the relations. Having said that, I think naturally, if assuming things are stable and the needle is more cooperative, obviously, I mean we are both very big economies. In many ways, we are markets to each other. We are part of the supply chain. They industrialised much faster and much bigger and much earlier, largely be-

cause of many of the policies we advocate,” he said.

“The world is competitive. We must build up our strengths. We have to do business with the entire world. That includes China too, but it is important we deal with them confidently. We stand our ground, as we have stood on the border. We develop our strengths, which unfortunately from the 1960s for half a century, we did not do. We have to make up for the shortcomings and the mistakes of the past, and that is really what we are hoping to do. So I think a stronger, more self-reliant India, a more industrialised India, a more manufacturing India will be able to actually compete with China as it will with other major countries of the world,” he said.

Jaishankar said the government had “taken up” with China the problem of business visas being faced by Indian applicants.

4. Ajit Doval in Beijing: Renewed India–China Boundary Engagement

Source: The Indian Express

GS: GS-II — India–China Relations

Context

National Security Advisor **Ajit Doval** is in Beijing for the **25th round of Special Representative-level talks** with Chinese Foreign Minister **Wang Yi** on the boundary question. The talks are significant as India and China seek to consolidate the post-2020 de-escalation and stabilise the broader relationship. The Special Representatives mechanism, established in **2003**, addresses the **3,488-km disputed boundary**.

Mains Perspective

I. Significance of Doval's Visit

- 1. Revival of High-Level Boundary Dialogue:** The 25th round provides a structured political channel to address the long-standing boundary dispute. The mechanism has not produced a final settlement but remains important for managing recurring tensions.
- 2. Consolidating Post-2020 De-escalation:** The **2020 Galwan crisis and subsequent military standoff** severely damaged bilateral relations. Renewed Special Representative talks indicate an effort to convert disengagement into sustained diplomatic stabilisation.
- 3. Border Peace as the Basis for Normalisation:** India has consistently linked normal bilateral relations with **peace and tranquillity along the Line of Actual Control (LAC)**. Therefore, progress on border management is central to rebuilding strategic trust.
- 4. Wider Diplomatic Significance:** The talks come ahead of the proposed **BRICS Summit in New Delhi on September 12–13, 2026**, creating an opportunity for broader high-level India–China engagement.

II. Major Challenges in India–China Relations

- 1. Unresolved Boundary Dispute:** The **3,488-km boundary** remains unsettled, with continuing differences over areas such as **Arunachal Pradesh**, which India firmly considers an integral part of the country.
- 2. Trust Deficit:** The 2020 crisis significantly weakened mutual confidence; hence, maintaining the present calm along the LAC and ensuring implementation of understandings remain critical.
- 3. Strategic Competition:** India and China compete for influence across the **Indo-Pacific and wider neighbourhood**, even while remaining important economic partners.
- 4. Economic Asymmetry:** Bilateral goods trade reached **US\$127.71 billion in FY 2024–25**, but India's exports were only **US\$14.25 billion** against **US\$113.46 billion of imports**, producing a **US\$99.21-billion trade deficit**.

5. Economic Vulnerability: The scale of imports from China highlights India's dependence in several manufacturing and intermediate-goods sectors, reinforcing the need for stronger domestic production and diversified supply chains.

III. Way Forward

1. Maintain LAC Peace: Continue military and diplomatic communication to preserve **peace and tranquillity** and prevent local incidents from escalating.

2. Pursue Boundary Negotiations: Use the Special Representative mechanism to work towards a **fair, reasonable and mutually acceptable framework** for the boundary question while separately managing immediate border concerns.

3. Engage China from a Position of Strength: Strengthen India's **manufacturing, technology, infrastructure and strategic capabilities** to reduce economic vulnerabilities and improve negotiating leverage.

4. Balance Competition with Cooperation: Cooperate where interests converge while diversifying supply chains and protecting India's strategic interests.

5. Build Stable Bilateral Relations: Combine **firmness on sovereignty and territorial integrity with sustained dialogue**, aiming for managed competition rather than recurring confrontation.

SUPREME LEADER SETS THE POLICIES, WE FOLLOW, SAYS IRAN PRESIDENT

US memorandum best path out of war, says Pezeshkian

Will target alternate shipping routes if neighbours join war: Security chief

Associated Press
Tehran, August 23

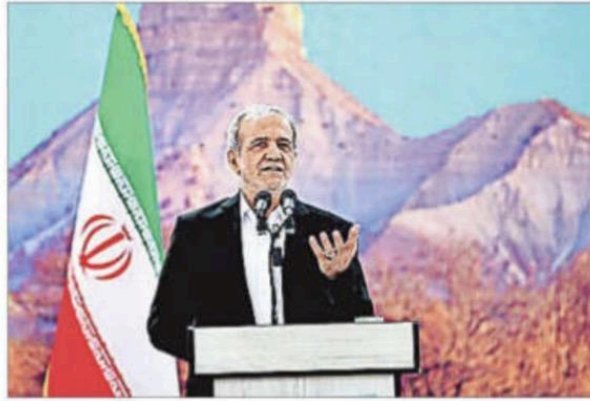
IRAN'S PRESIDENT defended a memorandum of understanding with the United States as the best way out of a stalled war.

Meanwhile, the new head of Islamic Republic's top security body warned, in a more forceful tone, of retaliation if neighbouring countries support US threats to further sanction Tehran.

Iranian President Masoud Pezeshkian defended a recent memorandum of understanding as the best way for the country to move beyond what he described as a situation of "neither war nor peace."

In a speech published by state-run *IRNA* early on Sunday, he said members of Iran's Supreme National Security Council believed the memorandum represented the best possible agreement based on what he described as dignity, wisdom and the national interest.

"There is not a single provision in this agreement that



Iran President Masoud Pezeshkian during a press meet in Ilam. FILE

amounts to capitulation," Pezeshkian said. "The supreme leader sets the policies, and we will follow that path."

The deal known as the Memorandum of Understanding that US President Donald Trump signed in June set an ambitious 60-day deadline for ending the war with Iran and reaching an accord on its nuclear program.

That period ended last week, but the two sides remain far apart, with no signs of compromise on the crucial issue of reopening the Strait of Hormuz, vital to global shipping.

Pezeshkian also linked the agreement to Iran's economic prospects, saying the country

could not attract investment in this stalled phase.

"Capital and money are extremely sensitive to risk," he said. "We have to remove this risk from the country."

Nearly six months into the war with the United States and Israel, the Iranian economy is suffering under sanctions and a naval blockade.

Meanwhile, the hard-line new leader of Iran's Supreme National Security Council warned Tehran's neighbours against joining the new US effort to hurt Iran's economy.

"If (Trump) wants to do something, we will retaliate in a seismic manner," Mohsen Re-

Pak army chief to visit Iran today

Cairo: Pakistan's army chief Asim Munir will visit Tehran on Monday to continue efforts to bring peace and security to the region, Iran's foreign ministry spokesperson Esmail Baghaei said on Sunday, according to a statement by the ministry.

Two Pakistani government sources confirmed Munir's visit to *Reuters*. "He (Munir) will discuss peace under Islamabad's MoU, Trump's warning and the situation after the Pakistan-Turkey-Saudi Arab Agreement and Houthi issues with Iranian leaders," sources said. **REUTERS**

zaei said in an interview with that aired Saturday.

Rezaei was named this month as part of senior appointments widely seen as hardening Tehran's political and military stance. His interview with *IRIB* is his most extensive public statement since then.

Rezaei said Iran would target oil-shipping routes out of the Persian Gulf — alternatives to the Strait of Hormuz — if neighbors join what he described as the economic war against Iran.

5. U.S.–Iran Memorandum: A Possible Path Out of War

Source: The Indian Express

GS: GS-II — International Relations | GS-III — Energy Security

Context

Iranian President **Masoud Pezeshkian** has defended the **U.S.–Iran Memorandum of Understanding (MoU)** as the best available route out of the prolonged conflict and the present situation of “neither war nor peace.” The 60-day framework has, however, expired without resolving major differences, particularly over the **Strait of Hormuz** and Iran’s nuclear programme.

Mains Perspective

I. Significance of the U.S.–Iran MoU

1. Diplomatic Exit from Prolonged Conflict: The MoU was intended to provide a framework for ending military hostilities and moving the two sides towards a broader agreement through negotiations rather than continued confrontation.

2. Economic Stabilisation for Iran: Iran’s economy has suffered from **sanctions, disrupted oil exports and reduced investment**. Pezeshkian argues that a diplomatic settlement is necessary to reduce economic uncertainty and restore investment.

3. Strait of Hormuz as a Core Issue: The reopening of the **Strait of Hormuz** remains central to the dispute because it is a critical route for global energy shipping. Failure to resolve the issue keeps regional and global energy markets vulnerable.

4. Nuclear Question: The MoU sought to create a framework for negotiations on Iran’s nuclear programme, but major differences remain. The lack of progress keeps the nuclear issue at the centre of U.S.–Iran tensions.

II. Major Challenges

1. Divergent Strategic Objectives: The United States seeks major concessions from Iran, while Tehran wants relief from sanctions and protection of its sovereignty and economic interests.

2. Strait of Hormuz Deadlock: Disagreement over reopening the Strait has prevented the diplomatic framework from developing into a lasting settlement, keeping a major global energy chokepoint under pressure.

3. Sanctions & Economic Pressure: Continued or additional U.S. sanctions restrict Iran’s oil revenues, investment and international economic integration, increasing pressure on its domestic economy.

4. Hard-Line Elements in Iran: Iran’s political and security establishment remains divided over the extent of engagement with Washington, making compromise domestically difficult.

5. Regional Security: The conflict has implications beyond Iran and the United States, involving Gulf countries and wider Middle Eastern security. Pakistan is also attempting diplomatic engagement with Tehran.

III. Way Forward

1. Prioritise Diplomacy: Both sides need sustained negotiations to convert the temporary framework into a durable political settlement rather than returning to military escalation.

2. Ensure Freedom of Navigation: A stable arrangement concerning the **Strait of Hormuz** is essential for regional stability and uninterrupted global energy flows.

3. Address the Nuclear Issue: Negotiations should establish verifiable limits and monitoring arrangements while recognising Iran's legitimate peaceful nuclear requirements.

4. Gradual Sanctions Relief: Any progress on Iran's nuclear and security commitments should be accompanied by predictable and phased **sanctions relief**, creating incentives for compliance.

5. Regional Mediation: Countries such as **Pakistan, Oman, Qatar and Saudi Arabia** can facilitate communication and confidence-building between the two sides.

Importance of elephant corridors in reducing conflict

Nikhil Ghanekar

New Delhi, August 23

A SUPREME Court Bench led by Chief Justice of India Surya Kant last week directed the Centre to conduct a fresh survey of elephant corridors. It said these corridors cannot be blocked fearing crop damage as elephant herds, by nature, travel long distances.

The Bench was hearing a writ petition on managing human-elephant conflict. The petition, in the past, had sought to prevent the use of fireballs, spikes and other such materials to drive away elephants. In its order, the Bench asked the Centre to indicate steps taken to prohibit the use of such methods or any other “coercive measure” to divert the natural movement of elephants.

Moving long distances

Asian elephants are highly mobile and social mammals. A male elephant’s average home range — the area it typically uses for food, water and shelter — extends between 50 and 300 sq km. Elephants can move through their range in herds or individually. These home ranges can also extend depending on habitat type, food availability, water sources, population density and human disturbances.

Elephant corridors, or movement pathways connecting two natural habitats, are crucial to facilitating elephant movement. Dis-



6. Importance of Elephant Corridors in Reducing Human–Elephant Conflict

Source: The Indian Express

GS: GS-III — Environment & Ecology

Context

The **Supreme Court** has directed the Centre to conduct a **fresh survey of elephant corridors** and take steps to prevent their obstruction. The Court also stressed that coercive methods used to divert elephants should be avoided. The issue highlights the need to conserve elephant habitats and movement corridors to reduce **human–elephant conflict**.

Mains Perspective

I. Why Elephant Corridors Matter

- 1. Natural Movement:** Asian elephants are highly mobile social mammals. A male elephant may have a home range of around **50–300 sq km**, depending on food, water, habitat and human disturbance. Corridors allow such movement between natural habitats.
- 2. Reducing Human–Elephant Conflict:** Connected corridors allow elephants to move towards seasonal sources of **food and water** without entering agricultural fields and human settlements.
- 3. Ecological Connectivity:** Corridors connect fragmented habitats, facilitate **dispersal and genetic exchange**, and help maintain healthy elephant populations.
- 4. Climate Resilience:** Seasonal changes, drought and changing availability of food and water influence elephant movement. Connected landscapes allow elephants to adapt naturally to such variations.

II. Major Challenges

- 1. Habitat Fragmentation:** Highways, railway lines, canals, power lines, mining and industrial activity can obstruct traditional elephant routes.
- 2. Agricultural Expansion:** Plantations, farmland, fencing and settlements increasingly occupy elephant movement areas, pushing elephants towards human habitation.
- 3. Infrastructure Bottlenecks:** Development projects that cut through corridors can create physical barriers and increase the probability of human–elephant encounters.

4. Changing Elephant Ranges: Habitat loss and mining pressures have contributed to elephants moving into new areas, including from **Jharkhand and Odisha towards Chhattisgarh, Madhya Pradesh and Maharashtra.**

III. Way Forward

1. Scientific Corridor Mapping: Regularly identify, map and monitor elephant corridors and their ecological bottlenecks.

2. Wildlife-Friendly Infrastructure: Infrastructure projects should incorporate **underpasses, overpasses and other wildlife crossings** wherever corridors are affected.

3. Landscape-Level Conservation: Conservation should extend beyond protected areas and maintain connectivity between **forests, feeding grounds and water sources.**

4. Community-Based Conflict Management: Early-warning systems, crop-protection measures and community participation can reduce losses while ensuring elephant conservation.

5. Avoid Coercive Diversion: As highlighted by the Supreme Court, management should facilitate elephants' **natural movement through protected corridors** rather than relying on harmful methods to forcibly redirect them.

IV. Prelims Connect — Asian Elephant

1. Scientific Identity: The Asian elephant is ***Elephas maximus*** and is classified as **Endangered on the IUCN Red List.**

2. Distribution & Habitat: India has the largest population of Asian elephants; they occur across forest, grassland and riverine landscapes and require large, connected habitats.

3. Social Behaviour: Female elephants generally live in **matriarchal herds**, while adult males are usually more solitary.

4. Conservation Status: Asian elephant — **IUCN: Endangered | CITES: Appendix I | Wildlife (Protection) Act, 1972: Schedule I.**

5. Project Elephant: Launched in **1992**, it focuses on elephant conservation, habitat and corridor protection and mitigation of human–elephant conflict.

V. Prelims Connect — Key Data

1. Latest Elephant Population: India's latest **DNA-based national elephant estimation (2021–25)** estimated **22,446 wild elephants.**

2. Elephant Reserves: India has **33 Elephant Reserves** across **14 States**, covering about **80,777 sq km**.

3. Elephant Corridors: The **2023 national mapping exercise** identified **150 elephant corridors** across **15 States**.

4. Major Elephant Landscapes: **Western Ghats; North-Eastern Hills and Brahmaputra floodplains; Shivalik Hills and Gangetic plains; Central India and Eastern Ghats.**

ARTIFICIAL INTELLIGENCE

AI is transforming cyber attacks as well as defences: What this means for India



EXPERT EXPLAINS
ANUBHA GUPTA
RESEARCH ASSOCIATE, ICWA

ARTIFICIAL INTELLIGENCE (AI) has reached mass adoption faster than any prior technology — the Internet took 15 years to reach a billion users, while ChatGPT did so in three.

This rapid adoption has major consequences for cybersecurity. AI is amplifying cyber threats at unprecedented speed, scale and sophistication across the cyber kill chain, from automated vulnerability discovery to AI-generated deepfakes and AI-enabled social engineering (using AI to trick/persuade people to take harmful actions). More significantly, AI is developing

the ability to act as an autonomous agent that can identify, plan, adapt and carry out offensive cyber operations.

Thus, countries with leading AI ecosystems gain a greater ability both to conduct sophisticated cyber campaigns and to defend against them.

But AI capabilities remain concentrated in very few countries. This raises pressing questions for India: how prepared is it to address AI-enabled cyber threats? What should India do to build the AI capabilities needed to secure its cyberspace?

Always lopsided

Cybersecurity was already lopsided, with a few countries holding far superior capabilities than the rest. Advances in frontier AI systems have pushed this further.

Reconnaissance, once dependent on humans gathering information about a target, is now automated and faster: research shows ChatGPT models being used to mine social media for precise details to craft AI-generated phishing emails. AI is also generating real-time deepfakes, deepening confusion about what is authentic online.

More dangerous capabilities have emerged at the weaponisation and command-and-control stage. One novel method is LLM-generated polymorphic malware — code that large language models can autonomously generate, modify and restructure to suit the situation, unlike traditional malware, which relies on fixed signatures and predictable patterns. In September 2025, Anthropic claimed a Chinese state-sponsored group, GTG-1002, had allegedly used Claude Code as an autonomous cyber agent across multiple stages of an attack — what Anthropic called the first reported case of an AI-orchestrated cyber-espionage campaign.

Perhaps most consequential is the emerging ability of frontier AI models to autonomously identify software vulnerabilities at scale. Anthropic's latest frontier model, Claude Myths Preview, has identified thousands of zero-day vulnerabilities — flaws previously unknown to developers — across major operating systems

and browsers, many of them critical, and developed related exploits largely without human intervention. It found a 27-year-old vulnerability in OpenBSD, an operating system reputed to be highly security-hardened and widely used to run firewalls and critical infrastructure.

Such vulnerabilities are especially dangerous for the Operational Technology and Industrial Control Systems that govern nuclear facilities, energy grids, pharmaceutical manufacturing, chemical processing, oil refineries and communication networks — infrastructure that grows more exposed as it integrates further with AI.

Old cyber defences will not hold against these new threats. Traditional antivirus, which looks for known malware fingerprints, and static security patches for known vulnerabilities are far less effective against malware that constantly changes and adapts.

AI in cybersecurity, by contrast, enables real-time threat detection, automated re-

sponse and large-scale data analysis, mitigating risks faster. The real AI divide, then, is not about who uses AI but who builds it, and who controls its development.

Questions for India

Last month, the ransomware group World Leaks claimed to have stolen and posted data related to India's largest nuclear plant, Kudankulam, including blueprints of facility parts and supplier details. Cyber intelligence firm CloudSEK's 2024 report placed India as the second-most cyber-attacked nation after the US; its 2025 report placed India sixth.

During Operation Sindoor, Pakistan-backed threat actors such as APT36 targeted India's critical sectors, including the Ministry of Defence, Army, Navy and DRDO, and for the first time, Bharat Operating System Solutions (BOSS) Linux.

Yet India's indigenous AI ecosystem remains incremental, lagging well behind the US and China across the AI stack — foundational models, GPUs, chip design and large-scale data-centre infrastructure — leaving it heavily dependent on the US and other technologically advanced countries.

Efforts made

Indian policymakers are aware of these stakes and have begun taking steps. Agencies like CERT-In have, since 2025, adopted AI-driven threat detection, cyber resilience measures, trusted AI frameworks and citizen-centric malware mitigation. In April, it issued an advisory for organisations to defend against AI-driven cyber risks. Some of the recommendations were about "removing unnecessary internet-facing services" and treating every newly discovered vulnerability as something that "could be exploited within hours, not weeks."

At the governance level, the Ministry of Electronics and Information Technology is exploring a consent-based framework for synthetically generated content, alongside curbs on agentic AI autonomy and clearer liability frameworks for AI models.

India can't build the AI stack overnight, but AI and cybersecurity can no longer be treated in silos — they must be seen as interconnected strands of policymaking: AI for cyber defence, and cybersecurity for AI.

epaper.indianexpress.com

New Delhi

7. AI is Transforming Cyber Attacks and Defences: What It Means for India

Source: The Indian Express

GS: GS-III — Science & Technology, Cybersecurity

Context

Artificial Intelligence (AI) is transforming cybersecurity by making both **cyber attacks and cyber defence faster, more automated and sophisticated**. The article highlights the emergence of AI-enabled reconnaissance, phishing, vulnerability discovery, autonomous cyber operations and adaptive malware, creating new challenges for India's critical infrastructure.

Mains Perspective

I. How AI is Transforming Cybersecurity

1. AI-Enabled Cyber Attacks: AI can automate the cyber kill chain—from reconnaissance and vulnerability discovery to phishing and social engineering—allowing attacks to be conducted at greater **speed, scale and sophistication**.

2. Autonomous Cyber Operations: AI agents can increasingly identify vulnerabilities, adapt their methods and carry out offensive operations with limited human intervention. The article cites **Claude Code** being allegedly used by the Chinese state-linked group GTG-1002 in an AI-orchestrated cyber-espionage campaign.

3. Adaptive Malware: **AI-generated polymorphic malware** can modify its code according to the situation, making traditional signature-based antivirus systems less effective.

4. AI as a Defensive Tool: AI can simultaneously strengthen cyber defence through **real-time threat detection, automated response, vulnerability identification and large-scale data analysis**, enabling faster identification of emerging threats.

II. Why It Matters for India

1. Critical Infrastructure Vulnerability: AI-enabled attacks pose particular risks to **Operational Technology (OT) and Industrial Control Systems (ICS)** used in nuclear facilities, energy, pharmaceuticals, chemical industries, oil refineries and communication networks.

2. India's Existing Cyber Exposure: The article cites a CloudSEK assessment placing India as the **second-most cyber-attacked country after the United States in 2024**, with India ranked sixth in its 2025 assessment.

3. Critical-Sector Targeting: During **Operation Sindoor**, Pakistan-backed threat actors reportedly targeted Indian critical sectors, including the **Ministry of Defence, Army, Navy, Defence Research and Development Organisation (DRDO) and Bharat Operating System Solutions (BOSS) Linux**.

4. AI Capability Gap: Advanced AI capabilities remain concentrated among a few technologically advanced countries. India therefore faces the dual challenge of **defending against AI-enabled attacks while developing its own AI capabilities**.

III. Key Challenges

1. AI-Driven Zero-Day Exploitation: AI models can identify previously unknown vulnerabilities at scale, potentially reducing the time available for organisations to patch systems.

2. Evolving Malware: Traditional antivirus systems based on known signatures and static patches struggle against malware that can **continuously modify and adapt itself**.

3. Critical Infrastructure Risk: Vulnerabilities in OT and ICS can have consequences beyond data theft, potentially disrupting **energy, nuclear, industrial and communication infrastructure**.

4. Dependence on Foreign AI Infrastructure: India continues to depend heavily on the **United States and China** across parts of the AI stack, including foundational models, Graphics Processing Units (GPUs), chip design and large-scale data-centre infrastructure.

IV. India's Response & Way Forward

1. Build Indigenous AI Capability: India needs stronger domestic capabilities in **AI models, semiconductor technology, computing infrastructure and cybersecurity**, reducing strategic dependence on external ecosystems.

2. Shift from Detection to AI-Native Defence: Cybersecurity must move beyond traditional signatures and static patches towards **real-time detection, automated response and adaptive defence systems**.

3. Strengthen Critical Infrastructure Protection: OT and ICS networks require specialised cybersecurity standards because conventional IT security measures may not adequately address their vulnerabilities.

4. Responsible AI Governance: India needs a governance framework addressing **synthetically generated content, AI autonomy and liability for AI systems**, while ensuring innovation is not unnecessarily restricted.

5. Institutional Preparedness: Agencies such as **CERT-In** need continued investment in AI-driven threat detection, cyber resilience and protection against AI-enabled attacks.

6. Integrated Policy Approach: AI policy and cybersecurity policy can no longer operate in silos. India needs an integrated approach combining **AI development, cyber defence, critical infrastructure protection and national security**.

V. Prelims Connect — Key Terms

1. Polymorphic Malware: Malware capable of changing or modifying its code to evade conventional signature-based detection.

2. Zero-Day Vulnerability: A previously unknown software vulnerability for which an effective security patch may not yet be available.

3. Operational Technology (OT): Technology used to monitor or control physical processes, particularly in industrial environments.

4. Industrial Control Systems (ICS): Systems used to control and monitor industrial processes and critical infrastructure.