Tirumal Classes Quality education

THE HINDU
INDIA'S NATIONAL NEWSPAPER SINCE 1878

Daily News Analysis

The Hindu Important News Articles & Editorial For UPSC CSE

Thursday, 11 Dec, 2025

Edition : International Table of Contents

Page 01 : GS 2 : International Relations/ Prelims

India–Russia defence cooperation has historically been the backbone of India's military modernisation, with platforms such as the Sukhoi-30MKI, S-400, INS Vikramaditya and Akula-class submarines shaping India's strategic capabilities. However, recent developments indicate a perceptible recalibration. Russia's renewed push to sell advanced platforms—including the Su-57 fifth-generation fighter aircraft, long-range drones such as the Geran series (Shahed-136 variants), and submarines—has met with a measured, almost reluctant response from India. This reflects broader shifts in India's defence procurement philosophy, technological priorities and geopolitical posture.

India gives tepid response to Russian push for Su-57, long-range drones and submarines

Saurabh Trivedi
NEW DELHI

Russia's latest pitch to expand defence cooperation – including offers of the Su-57 fifth-generation stealth fighter, long-range drones and submarines – has met with a lukewarm response from India, officials familiar with the matter said.

A senior official said that in the run-up to President Vladimir Putin's recent visit to India, Moscow made repeated outreach promoting platforms such as the Geran series of kamikaze drones, submarines and aircraft.

"India didn't show much interest in the equipment offered by Russia. The Russians were expecting major movement on the sidelines of the visit and are still pursuing the proposals. We are very much focusing on development of indigenous products," the official said.

Russia's Su-57E fighter jet takes off during the inauguration of AERO INDIA 2025 in Bengaluru in February. K. MURALI KUMAR

Despite high expectations, the much-watched defence announcements during Mr. Putin's visit did not materialise. While 19 agreements aimed at boosting bilateral trade were signed, there was no breakthrough on collaboration involving the Su-57 or Russia's S-500 air defence system.

The restrained response comes at a time when India is driving an aggressive push towards self-reliance in defence manufacturing.

On Sunday in Leh, while dedicating 125 newly completed Border Roads Organisation (BRO) projects to the nation, Defence Minister Rajnath Singh underscored the transformation in domestic capacity.

Paradigm shift

He highlighted that India, once heavily dependent on arms imports, now boasts a record defence production value of ₹1.51 lakh crore, up from ₹46,000 crore in 2014. Defence exports have surged from under ₹1,000 crore to nearly ₹24,000 crore in a decade. It reflects a paradigm shift.

The Geran drones – Russia's indigenised variant of Iran's Shahed-136 kamikaze drone – have played a major role in Moscow's low-cost attrition strategy in Ukraine, enabling mass salvo attacks. But Indian manufacturers and services have not shown interest in acquiring them.

On October 29, the 23rd Working Group Meeting of the India-Russia Inter-Governmental Commission on Military Technical Cooperation was held in Moscow. Co-chaired by Sanjeev Kumar, Secretary (Defence Production), and Andrey A. Boytsov, First Deputy Director of Russian Federal Service for Military-Technical Cooperation, the discussions spanned tri-service cooperation and defence R&D.

The meeting concluded with the signing of a Protocol outlining fresh areas of collaboration and mutual growth – even as big-ticket defence deals remain elusive.

Key Developments

Russian Outreach Ahead of Putin's Visit

Moscow made sustained efforts to promote the Su-57E, kamikaze drones and submarine platforms.

India, however, signalled limited interest, citing a preference for indigenisation and domestic R&D initiatives.

Lack of Major Announcements During the Summit

While 19 agreements were signed on the economic front, none pertained to high-value defence deals like Su-57 or S-500.

This absence is notable given that Russia expected progress during high-level political engagement.

Growing Indian Emphasis on Atmanirbhar Defence Manufacturing

Defence production has reached ₹1.51 lakh crore—tripling since 2014.

Defence exports jumped from less than ₹1,000 crore to nearly ₹24,000 crore.

India's armed forces and private sector are less inclined to import platforms that can be developed domestically or through diversified partnerships.

Limited Interest in Geran / Shahed-Class Drones

Despite their significant battlefield use in Ukraine, Indian services reportedly see limited value in acquiring them.

India is instead developing indigenous loitering munitions, swarm drones, and high-end UAV capabilities.

Bilateral Working Group Meeting (Moscow, Oct 29)

Discussions focused on tri-service cooperation and defence R&D.

A Protocol was signed outlining new areas of cooperation.

However, no breakthrough occurred on headline platforms—indicating a cautious, incremental approach.

Strategic Significance and Underlying Factors

1. India's Strategic Autonomy and Risk Diversification

Russia's deepening dependence on China post-Ukraine raises Indian concerns about long-term reliability.

India seeks to avoid excessive dependence on any single source, broadening procurement to the US, France, Israel, and domestic industry.

2. Technological Concerns about Offered Platforms

Su-57's combat maturity, stealth performance, and production timelines remain contested.

Similarly, Russian drones are optimised for low-cost attrition warfare—less relevant for India's doctrine focused on precision, survivability, and network-centric operations.

3. Sanctions and Geopolitical Constraints

Procurement of advanced Russian platforms invites CAATSA-related risks.

India must balance its Russia partnership with growing strategic convergence with the US and Quad allies.

4. Policy Push for Indigenisation

India is prioritising the AMCA programme (fifth-generation fighter), LCA Mk-2, TEDBF, and indigenous submarines.

Importing Su-57 or drones could undermine domestic R&D momentum at a crucial stage.

Implications for India–Russia Defence Relations

Shift from Buyer–Seller to Co-Development Model : Engagements may move toward joint R&D, technology transfer, and niche cooperation (materials, propulsion, space defence).

Reduced Indian Appetite for Big-Ticket Imports: India's procurement pipeline is increasingly dominated by indigenous systems, meaning fewer opportunities for Russian platforms.

Russia Still Remains a Critical Partner

Legacy equipment sustains dependence for spares and upgrades.

Nuclear submarine leasing, missile technology cooperation, BrahMos partnership, and space collaboration continue to be significant pillars.

Perception Management Challenge : Russia seeks to preserve India as a major defence customer; India seeks to avoid signalling strategic drift without compromising its autonomy or domestic industry growth.

Conclusion

India's restrained response to Russia's push for Su-57 fighters, long-range drones, and submarines reflects a deeper structural transformation in Indian defence strategy. The focus is now on indigenisation, diversification, and long-term strategic autonomy rather than traditional import-heavy engagements. While Russia will remain an important defence partner, especially in legacy systems and co-development programmes, India's procurement decisions will increasingly be guided by technological self-reliance, geopolitical risk calculations, and doctrinal fit. The latest episode underscores the maturing of India's defence policy and its determination to shape a more balanced and self-sufficient national security architecture.

UPSC Prelims Practice Question

Ques: **With reference to India's defence procurement trends, which of the following BEST explains India's limited interest in Russian platforms such as the Su-57 and Geran-series drones?**

1. India seeks to avoid technology black boxes and prioritises indigenous development.

2. India's doctrinal emphasis favours high-end precision systems rather than low-cost attrition platforms.

3. Russia's increasing strategic dependence on China raises long-term reliability concerns.

4. Su-57 is already inducted in large numbers by Russia, reducing export prospects.

Select the correct answer using the code below:

A. 1, 2 and 3 only

B. 1 and 4 only

C. 2, 3 and 4 only

D. 1, 2, 3 and 4

Ans: A)

UPSC Mains Practice Question

Ques: India's lukewarm response to Russia's recent defence proposals signals a structural shift in the India–Russia strategic partnership. Analyse. **(150 Words)**

Page 06 : GS 1 : Art and Culture / Prelims

UNESCO's Intergovernmental Committee has inscribed **Deepavali** on the Representative List of the Intangible Cultural Heritage of Humanity. This recognition situates the festival as an important element of global cultural heritage, affirming its role in social cohesion, traditional craftsmanship, and inter-community bonding. The inscription also aligns India's cultural diplomacy efforts with global frameworks for preserving intangible heritage.

Deepavali enters intangible heritage list

UNESCO says it strengthens social bonds, supports traditional crafts, reinforces values of generosity; PM says people are thrilled at the honour; Minister calls it a moment of national pride

The Hindu Bureau
NEW DELHI

Deepavali, India's festival of lights, was on Wednesday inscribed on the UNESCO's Representative List of the Intangible Cultural Heritage of Humanity.

The inscription was adopted in the presence of Union Minister of Culture Gajendra Singh Shekhawat, senior officials, and delegates from 194 member states, international experts, and representatives of UNESCO's global network, at an event held at the Red Fort here.

The announcement came during the 20th session of the UNESCO's Intergovernmental Committee.

UNESCO's inscription acknowledges Deepavali as a living heritage that strengthens social bonds, supports traditional craftsmanship, reinforces values of generosity and well-being, and contributes meaningfully to several Sustainable Development Goals.

Living heritage: Deepavali thrives through the contributions of potters crafting traditional earthen lamps. VIJAY SONEJI

Prime Minister Narendra Modi said people in India and around the world were thrilled at the UNESCO honour. "For us, Deepavali is very closely linked to our culture and ethos. It is the soul of our civilisation. The addition of Deepavali to the UNESCO Intangible Heritage List will contribute to the festival's global popularity even further," he said in a post on X.

Addressing the international delegates at the event, the Union Minister said the inscription marks a moment of immense pride for India and for communities across the world who keep alive the timeless spirit of Deepavali.

Highlighting the people-centric nature of the festival, he emphasised that Deepavali thrives through the contributions of millions, including potters crafting traditional 'diyas' (earthen lamps), artisans preparing festive decor, farmers, sweet-makers, priests, and households that uphold age-old customs.

(With PTI inputs)

Why This Recognition Matters (Context for GS-1 Culture)

Cultural Continuity : Deepavali, celebrated across religions and regions, represents the continuity of Indian civilisational values such as **victory of light over darkness**, **knowledge over ignorance**, and **well-being of communities**.

Living Heritage Principles : Unlike monuments, intangible heritage is transmitted through people, practices, rituals, and craftsmanship. UNESCO's recognition acknowledges that Deepavali is sustained by **millions of cultural practitioners**:

potters (diyas)

artisans (rangoli, torans, décor)

farmers

sweet-makers

priests and households

Alignment with Sustainable Development Goals (SDGs): UNESCO explicitly links Deepavali to SDGs:

SDG 8: promoting traditional livelihoods (crafts, small enterprises)

SDG 11: protecting cultural heritage

SDG 12: sustainable consumption through traditional handmade crafts

SDG 16: promoting peaceful societies through community bonding

Strategic Significance for India

(a) Strengthening Cultural Diplomacy

Deepavali is already celebrated globally. UNESCO recognition enhances India's cultural soft power and supports India's positioning as a civilisational state with diverse living traditions.

(b) Boost to Traditional Craftsmanship and Rural Economy

Recognition can help mobilise schemes under **GI tags, cluster development, ODOP, handicraft promotion**, etc.

It creates pathways for **formal safeguarding plans**, which UNESCO expects from State Parties.

(c) Tourism and Cultural Industries

Cultural tourism during Deepavali can be expanded domestically and internationally.

States like Uttar Pradesh (Ayodhya), Tamil Nadu, Odisha, and Delhi may leverage this visibility for heritage-based tourism.

(d) Community Identity and Social Cohesion

The festival's inter-community nature supports India's pluralism.

Reinforces shared rituals across caste, class, gender, and regional lines.

Issues and Challenges Even After UNESCO Recognition

Commercialisation vs. Cultural Integrity: Excessive commercialisation may dilute traditional forms such as handmade diyas, indigenous sweets, and local rituals.

Environmental Concerns

Air and noise pollution due to firecrackers

Increasing market share of mass-produced Chinese decorative items

These issues complicate efforts to promote sustainable cultural practices.

Safeguarding Intangible Heritage: UNESCO listing requires a **clear safeguarding plan**, but India's coordination between central bodies, State governments, and local communities often remains weak.

Decline in Traditional Craft Livelihoods: Despite recognition, artisans may not automatically gain economic protection unless linked to formal market and credit support.

Way Forward

Comprehensive Safeguarding Plans

Mapping artisans involved in Deepavali's cultural ecosystem.

Training programs for traditional crafts (earthen lamps, rangoli colours, metalwork).

Promoting Green and Sustainable Deepavali

Incentivising non-polluting and handmade crafts.

Phasing out environmentally harmful practices.

Enhancing Cultural Infrastructure

Cultural hubs, craft villages, and heritage circuits.

Collaboration with the private sector for marketing traditional crafts.

Leveraging Digital Platforms

Global storytelling campaigns on Deepavali traditions.

E-commerce support for artisans (ONDC, GeM platform integration).

Conclusion

Deepavali's inclusion in UNESCO's Intangible Cultural Heritage List is a critical cultural milestone for India. It validates Deepavali's role as a living tradition rooted in social harmony, craftsmanship, and civilisational values. Going forward, the challenge lies not in recognition alone but in ensuring safeguarding, sustainability, and community empowerment so that the festival's cultural richness continues to thrive across generations.

UPSC Prelims Practice Question

Ques : With reference to UNESCO's Intangible Cultural Heritage (ICH) framework, consider the following statements:

1. An intangible cultural element may be inscribed on the Representative List only if the concerned State submits a safeguarding plan.

2. Festivals and social practices can be included under intangible cultural heritage.

3. Once an element is inscribed, UNESCO provides mandatory financial assistance for its protection.

Which of the statements given above is/are correct?

A. 1 and 2 only

B. 2 and 3 only

C. 1 and 3 only

D. 1, 2 and 3

Ans :a)

UPSC Mains Practice Question

Ques : How can UNESCO recognitions such as Deepavali strengthen India's cultural diplomacy and soft power? Evaluate.

Page 07 : GS 3 : Environment / Prelims

The Western Tragopan (Tragopan melanocephalus), one of India's rarest pheasants and the state bird of Himachal Pradesh, is facing critically fragmented habitats, climate-linked disruptions, and anthropogenic pressures. Recent reports highlight the success of the Sarahan Pheasantry's captive breeding programme, the world's first for this species, but also underline that ex-situ conservation alone cannot secure the species' survival without strong, simultaneous in-situ habitat protection.

Breeding project gives endangered western tragopan breathing space

Experts warn that, despite the success of the captive breeding project, the species' long-term survival remains uncertain without simultaneous habitat protection; fewer than 9,500 individuals remain in the wild and climate change and encroachment continue to pose a threat

Aditya Ansh

The western tragopan (*Tragopan melanocephalus*) is one of India's rarest pheasants and the state bird of Himachal Pradesh. It was once found across parts of Jammu & Kashmir, Himachal Pradesh, and Uttarakhand, but now survives in small, fragmented pockets.

Studies in the forests of Kuzinag and Limber in Jammu & Kashmir have revealed that while habitats with suitable climates for the bird do exist, human disturbance and habitat fragmentation continue to endanger its future.

Conservationists at the International Union for the Conservation of Nature (IUCN) have estimated that only 3,000-9,500 mature tragopans remain and that all belong to a single subpopulation. Roughly a quarter lie across the western Himalayas and the northern parts of Pakistan.

Yet deep inside Himachal Pradesh's Great Himalayan National Park, seasoned bird-watchers have said the tragopan still holds its ground.

The Sarahan Pheasantry

"Seeing one in the wild is rare and depends a lot on planning and luck, where sightings are about 60% on well planned trips," said Panki Sood, a seasonal birdwatcher and a host at a travel company.

Wildlife Institute of India records say the first captive births took place in 1993. In 2005, the Himachal Pradesh Forest Department achieved a first when four western tragopan chicks hatched at the Sarahan Pheasantry, marking the world's first successful captive breeding programme in the world. From 2007 to 2015, 43 captive-born individuals were recorded, although their survival rates fluctuated due to skewed sex ratios and mortality among older birds. Genetic analysis further revealed that the entire captive population had originated from only eight wild founders, retaining about 87% of their genetic diversity.

Sarahan Pheasantry staff recalled how inconsistent the early years were.

"In 2007-2008, there were none at all," Ms. Keerthi (name changed on request), who has worked at the pheasantry for more than a decade, said. "There were no eggs, so no chicks. It was only after the biologists came that eggs and chicks finally began appearing."

"When I joined as a research fellow in 2011, the Sarahan Pheasantry hosted about 15 birds," Wildlife Institute of India senior fellow Lakshminarasimha R. recalled.

To stabilise the programme, the experts began to redesign core husbandry systems. "The primary approach was to develop protocols for managing species in captivity. We referred to how it behaved in the wild," Mr. Lakshminarasimha said.

Captive tragopans were very sensitive to stress, diseases, and the conditions in the artificial enclosure. Researchers thus recreated elements of their natural habitat, such as dense cover with specific nesting materials and incorporated seasonal dietary changes.

Everything from nesting material and vegetation to diet and feeding schedules were reworked to mimic the tragopan's natural habitat as closely as possible.

"We have 46 tragopans now," Ms. Keerthi added. "This year, seven or eight chicks hatched and five or six have survived."

A captive western tragopan at the Saharan Pheasantry. P. JEGANATHAN (CC BY SA)

Climate variability, breeding

"Captive breeding emerged as a tool of insurance against major declines," Rahul Kaul, chair of the Galliformes Specialist Group at the IUCN, said.

"But it was always meant to complement, not replace, habitat protection. Unfortunately, much emphasis and resources were laid on protecting and breeding tragopans from outside the wild [*ex-situ*] while the conservation of species in their natural habitats [*in-situ*] was hugely undermined."

Mr. Kaul has been closely involved with pheasant conservation across the Himalayas and also said the initiative was well-intentioned.

"The idea was to breed enough birds for release into identified habitats. Decades later and several crores of rupees spent, we are where we started in terms of conservation benefit. The forest department must be credited for their perseverance: they did produce birds, but without parallel habitat protection, the gains remain limited."

Ex-situ programmes have tried to build population security, but a greater threat today is the slow disruption of the tragopan's timing system that synchronises breeding, insect availability, and seasonal changes in the wild.

"Climate variability affects species like the tragopan through warming at lower altitudes and disruption of food resources," Mr. Kaul said.

"If breeding no longer synchronises with insect availability, the chicks may starve. The forests themselves hold the species together, allowing the pheasants to persist. In some areas of Pakistan, communities identify breeding zones and voluntarily leave them untouched until the chicks can fly. Maybe such adaptive models can be tried [in India] too."

> The entire objective was to move towards reintroduction. In 2020-2021, we carried out releases and results showed the approach was viable
>
> R. LAKSHMINARASIMHA
> WILDLIFE INSTITUTE OF INDIA

Stalled rewilding attempt

At the Sarahan Pheasantry, where captive breeding continues, staff members said efforts to take the next step have wanted for support.

"The entire objective was to move towards reintroduction, specifically into forests surrounding Sarahan, and we were finally ready for it. In 2020-2021, we carried out experimental releases and results showed that the approach was viable," Mr. Lakshminarasimha said.

Sources from the Himachal Pradesh Forest Department also acknowledged the *ex-situ* programme had reached a stable phase. They added that the Pheasantry now consistently maintains over 40 western tragopans, with six to eight eggs hatching and four to five chicks surviving every year, figures made possible by years of refinement and expert inputs.

Returning tragopans to the wild is also the most demanding phase of the programme. One forest guard said the Pheasantry had conducted reintroduction trials for two years, releasing birds deep into the forest and tracking them using radio collars. One individual survived in the wild for nearly a year – a highly encouraging sign for such an early-stage attempt – until its tag's battery expired.

According to Forest Department sources (who wished to remain unnamed due to the sensitivity of commenting on reintroduction funding and programme status), reintroductions have been on hold since 2023 partly due to budgetary constraints linked to wider spending cuts by the State government. Some officials have also stressed that funding is only one part of the challenge.

"The real bottleneck," one official noted, "is the research and protocol development needed before each new release."

Before a tragopan can be returned to the wild, teams must check if release sites and food are available, monitor the birds' predators, and make sure the captive-bred birds can adapt to natural conditions. Mr. Narasimha said he's more hopeful. Reintroduction, he explained, "cannot happen overnight".

Like the decade-long effort that made captive breeding successful, reintroduction also demands patience, experimentation, and adaptive management: "You cannot draw conclusions from only a few attempts. This is a long-term commitment."

Community support

Despite these challenges, those working closest to the species believe the western tragopan's survival hinges on people as much as policy.

Mr. Sood said local stewardship had already shifted the trajectory: "Community-based tourism is one of the best ways to protect this rare bird."

He added that tourism offered local families an alternative income source that didn't depend on forest resources or grazing, giving them direct incentives to keep breeding areas undisturbed.

Since villagers stopped disrupting the forest, more tragopans have been sighted, he said, citing examples from the Rakhundi and Shilt areas.

(Aditya Ansh and Divyam Gautam are independent media writers based in India. adityaansh30@gmail.com)

Key Highlights of the Issue

A. Conservation Status

IUCN estimate: 3,000–9,500 mature individuals remaining.

Entire population belongs to one subpopulation, increasing vulnerability.

Found in fragmented pockets of J&K, Himachal Pradesh, Uttarakhand, and northern Pakistan.

B. Success of Captive Breeding

First captive hatchings: 1993; major breakthrough at Sarahan Pheasantry in 2005.

46 individuals currently maintained; consistent annual hatching (6–8 eggs, 4–5 chicks surviving).

Captive population retains 87% of genetic diversity, despite originating from only 8 wild founders.

Husbandry reforms (diet, nesting material, enclosure design) improved chick survival.

C. Major Concerns

Habitat fragmentation, human disturbance, and climate variability continue to degrade natural habitats.

Breeding synchrony with insect availability is threatened by climate change.

Limited reintroduction success so far; experimental releases promising but paused due to:

- Budget cuts (2023 onwards)
- Research gaps in release protocols
- High demand for long-term monitoring

D. Role of Communities

Community-driven conservation and tourism in the Rakhundi and Shilt areas reduced disturbance.

Pakistan's example: communities voluntarily leave breeding zones undisturbed.

Key Analysis

A. Why Conservation of Western Tragopan Matters

Flagship Himalayan species → indicates health of mid-altitude temperate forests.

Represents unique Western Himalayan biodiversity.

Conservation aligns with:

- National Biodiversity Action Plan

Convention on Biological Diversity (CBD) commitments

Wildlife Protection Act, 1972 Schedule I protection

B. Successes of the Ex-Situ Programme

Impactful outcomes:

Prevents immediate extinction risk.

Provides a genetic reservoir for future reintroduction.

Developed species-specific protocols for highly sensitive galliformes.

However, the article stresses that captive breeding is an insurance, not a solution.

C. Limitations and Structural Gaps

In-situ conservation failure

Forest fragmentation continues unabated.

Climate change altering food cycles (phenological mismatch).

Institutional and Financial Barriers

Reintroduction halted due to inadequate funding.

Research-intensive protocols needed before each release.

Overemphasis on breeding, under-investment in habitat protection

As per IUCN experts, the programme has not translated into population recovery in the wild.

D. Climate Change as an Emerging Threat

Warming at lower altitudes forces species to shift upward → limited habitat availability.

Breeding-insect synchrony mismatch → chick starvation.

Altered vegetation may reduce nesting cover.

E. Pathways for Future Policy

Strengthening In-Situ Conservation

Identify and legally protect core breeding habitats.

Restrict grazing, tree felling, and human disturbance during nesting season.

Reviving Reintroduction Programs

Secure long-term funding.

Develop adaptive release protocols (soft-release, predator monitoring).

Radio-telemetry and post-release monitoring.

Climate-Resilient Approaches

Habitat corridors for climate-driven movement.

Scientific monitoring of phenology (insects, vegetation, snowfall patterns).

Community-Based Conservation

Promote eco-tourism and nature guiding as alternative livelihoods.

Replicate successful models from Pakistan where communities voluntarily protect breeding zones.

Conclusion

The Western Tragopan's story is a classic reminder that captive breeding alone cannot rescue a species unless paired with strong, resilient natural habitats. While Himachal Pradesh's Sarahan Pheasantry has achieved a globally acclaimed conservation milestone, the absence of parallel habitat protection, climate-induced disruptions, and stalled reintroduction efforts limit long-term success.

Going forward, a combined strategy—integrating scientific breeding, sustained funding, community stewardship, and in-situ habitat restoration—is essential for ensuring that this iconic Himalayan bird does not remain confined to enclosures but returns to thrive in the wild.

UPSC Prelims Practice Question

Ques: Consider the following statements regarding the Western Tragopan:

1. It is endemic to the Eastern Himalayas.

2. It is listed under Schedule I of the Wildlife Protection Act, 1972.

3. Its entire wild population forms a single subpopulation.

Which of the above statements is/are correct?

A. 1 and 2 only

B. 2 and 3 only

C. 1 and 3 only

D. 1, 2 and 3

Ans : b)

UPSC Mains Practice Question

Ques: Ex-situ conservation without parallel in-situ habitat protection cannot ensure long-term species recovery. Examine with reference to the Western Tragopan breeding project in Himachal Pradesh.

Page 07 : GS 3 : Environment / Prelims

The Copernicus Climate Change Service (C3S) reports that 2025 is likely to become the 2nd or 3rd warmest year on record, continuing an alarming trend in global temperature rise. The period 2023–2025 is projected to be the warmest three-year span ever recorded, with temperatures nearly 1.4°C above pre-industrial levels.

This comes soon after COP30, where global negotiations again failed to mobilize adequate commitments for emission reduction. The findings revive concerns about the Paris Agreement's 1.5°C target, which the UN now says is "no longer realistically achievable" without drastic emission cuts.

A car burns during a wildfire in Meda, Portugal. REUTERS

EU scientists say 2025 set to be second or third warmest year

The Hindu Bureau

This year is set to be the world's second or third-warmest on record, potentially surpassed only by 2024's record-breaking heat, the European Union's Copernicus Climate Change Service (C3S) said on December 9.

The data is the latest from C3S following last month's COP30 climate summit, where governments failed to agree on substantial new measures to reduce greenhouse gas emissions, reflecting strained geopolitics as the U.S. rolls back its efforts, and some countries seek to weaken CO2-cutting measures.

This year will also likely round out the first three-year period in which the average global temperature exceeded 1.5°C above the 1850-1900 pre-industrial period, when humans began burning fossil fuels on an industrial scale, C3S said in a monthly bulletin.

"These milestones are not abstract - they reflect the accelerating pace of climate change," said Samantha Burgess, strategic lead for climate at C3S.

Extreme weather continued to hit regions around the globe this year. Typhoon Kalmaegi killed more than 200 people in the Philippines last month. Spain suffered its worst wildfires in three decades due to weather conditions that scientists confirmed were exacerbated by climate change.

The global threshold of 1.5 Celsius is the warming limit that countries pledged to stay below as part of the Paris Agreement in order to avoid the worst consequences of warming

Last year was the planet's hottest on record.

While natural weather patterns mean temperatures fluctuate year to year, scientists have documented a clear warming trend in global temperatures over time, and confirmed that the main cause of this warming is greenhouse gas emissions from burning fossil fuels.

The last 10 years have been the 10 warmest years since records began, the World Meteorological Organisation said earlier this year.

The global threshold of 1.5 Celsius is the warming limit that countries pledged to stay below under the 2015 Paris Climate Agreement in order to avoid the worst consequences of warming.

The world has not yet technically breached that target, which refers to an average global temperature of 1.5 Celsius over decades. But the U.N. said this year that the 1.5 Celsius goal can no longer realistically be met and urged governments to cut CO2 emissions faster, to limit overshooting the target.

C3S's records go back to 1940, and are cross-checked with global temperature records going back to 1850.

In a separate update ahead of COP30, the World Meteorological Organisation said the period from 2015 to 2025 is also set to rank as the 11 warmest years on instrumental record, with 2023-2025 the three warmest years and 2025 about 1.4°C above the pre-industrial average so far.

Likewise, the UN Environment Programme's Emissions Gap Report 2025 had warned that even if countries implement their national climate plans in full, global temperatures this century would still be headed for around 2.3-2.5°C of warming, while current policies would deliver around 2.8°C.

It also estimated that global emissions would have to drop by half by 2035 to keep the 1.5°C pathway open, at least briefly.

Analysts have also noted an unprecedented 0.4°C rise in global temperature in just two years, suggesting the world may already be edging into the psychologically important post-1.5°C regime

With inputs from agencies.

KEY FINDINGS FROM THE REPORTS

1. Rising Global Temperatures

2025 will be among the **warmest years in history**, only behind or comparable to 2024.

The world has seen an unprecedented **0.4°C rise within just 2 years**, signalling rapid acceleration.

Last 10 years = warmest decade ever recorded (WMO).

2. First Three-Year Period Crossing 1.5°C (Temporarily)

2023–25 will likely average **>1.5°C above pre-industrial levels** temporarily.

The threshold is defined over decades, so Paris Agreement is not yet officially breached, but is effectively slipping out of reach.

3. Extreme Weather Intensification

Philippines: Typhoon Kalmaegi killed >200.

Spain: Worst wildfires in 30 years, amplified by climate dynamics.

Portugal: Massive wildfires (image reference).

4. Policy Gaps (UNEP Emissions Gap Report 2025)

Even if all national pledges are fully implemented → **2.3–2.5°C warming**.

Under current policies → **~2.8°C warming**.

To keep a temporary 1.5°C pathway open → **50% emission reduction by 2035** is required.

5. Geopolitical Breakdown

U.S. rollback on climate commitments.

Some countries actively pushing to weaken CO_2-cutting measures.

Reflects increasing **climate negotiation fatigue** and **global geopolitical fragmentation**.

1. Facts Useful for Prelims

C3S (Copernicus Climate Change Service): EU's Earth observation program; maintains global climate records since 1940.

WMO: Global temperature records since 1850.

Paris Agreement Goals:

Keep global temperature rise **well below 2°C**, pursue **1.5°C limit**.

1.5°C threshold is measured over a 20–30 year moving average, not a single year.

Emissions Gap Report: Annual UNEP publication assessing gaps between current trajectories and Paris goals.

Mains Analysis

1. Significance of the Findings

Indicates **accelerated climate change**, not gradual.

Highlights **failure of global climate governance** despite 30+ years of negotiations.

Demonstrates vulnerability of countries to **extreme weather**, especially developing nations.

2. Implications for India

Greater frequency of **heatwaves** (IMD already reports increasing number of heatwave days).

Higher risk of **glacial lake outburst floods (GLOFs)** in the Himalayas.

Agricultural stress due to unpredictable monsoons.

Coastal vulnerability to **sea-level rise** and intense cyclones.

3. Challenges Exposed

Climate finance gap: Developed countries not meeting USD 100 billion per year commitment.

Lack of US leadership post policy rollback.

Rising geopolitical tensions reducing climate cooperation.

Fossil-fuel dependence still strong in Global North and South.

4. Why the Paris Agreement May Fail

Nationally Determined Contributions (NDCs) are **voluntary**, not enforceable.

Climate ambition is **not aligned** with scientific recommendations.

Emerging economies need energy for development → transition is costly.

5. Way Forward

Rapid decarbonisation with clear sectoral roadmaps (transport, buildings, power).

Global carbon pricing mechanism or carbon markets strengthening.

Technology transfer: Green hydrogen, storage tech, CCUS.

Climate-resilient infrastructure to reduce deaths from disasters.

Strengthening **Early Warning Systems (EWS)** globally.

CONCLUSION

The C3S, WMO, and UNEP findings collectively underline that the world is entering a **post-1.5°C regime**, with unprecedented warming occurring at accelerating speed. The scientific clarity stands in sharp contrast to political inaction.

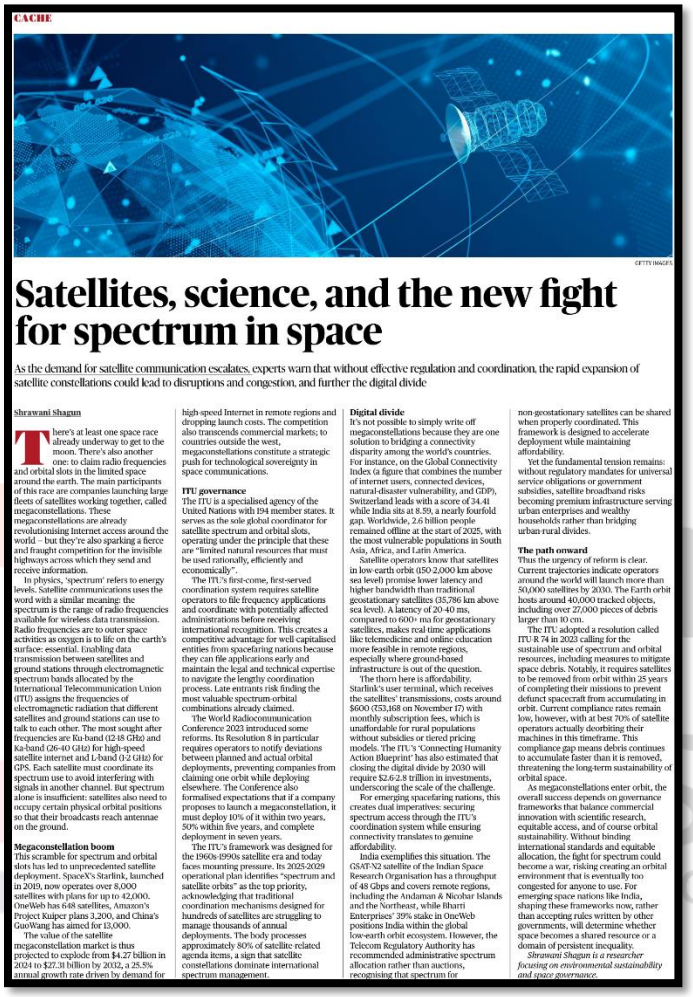
If global climate governance continues on its current trajectory, the world is headed toward **2.5–3°C warming**, which scientists warn will trigger irreversible tipping points. Strengthened climate ambition, faster emission reduction, and meaningful climate finance are now not optional but essential for avoiding catastrophic climate futures.

UPSC Mains Practice Question

Ques : Recent scientific assessments by institutions such as the Copernicus Climate Change Service (C3S), WMO, and UNEP indicate that the world is entering a post-1.5°C warming phase much earlier than anticipated. In this context, critically analyse the implications of accelerated global warming on global climate governance and suggest a robust way forward. **(250 Words)**

Page 11 : GS 3 : Science and Tech

The exponential rise of satellite megaconstellations (Starlink, OneWeb, Kuiper, GuoWang, etc.) has triggered a new global contest—not for land or minerals, but for **radio frequency spectrum and orbital slots**, which are limited natural resources essential for satellite communications. As Low-Earth Orbit (LEO) satellites scale from hundreds to tens of thousands, concerns about **spectrum congestion, orbital crowding, affordability, and governance gaps** have become central to global technology politics. This article highlights how scientific, commercial, and geopolitical interests are shaping a rapidly changing space environment with direct implications for India's strategic and developmental priorities.



CACHE

GETTY IMAGES

Satellites, science, and the new fight for spectrum in space

As the demand for satellite communication escalates, experts warn that without effective regulation and coordination, the rapid expansion of satellite constellations could lead to disruptions and congestion, and further the digital divide

Shrawani Shagun

There's at least one space race already underway to get to the moon. There's also another one: to claim radio frequencies and orbital slots in the limited space around the earth. The main participants of this race are companies launching large fleets of satellites working together, called megaconstellations. These megaconstellations are already revolutionising Internet access around the world – but they're also sparking a fierce and fraught competition for the invisible highways across which they send and receive information.

In physics, 'spectrum' refers to energy levels. Satellite communications uses the word with a similar meaning: the spectrum is the range of radio frequencies available for wireless data transmission. Radio frequencies are to outer space activities as oxygen is to life on the earth's surface: essential. Enabling data transmission between satellites and ground stations through electromagnetic spectrum bands allocated by the International Telecommunication Union (ITU) assigns the frequencies of electromagnetic radiation that different satellites and ground stations can use to talk to each other. The most sought after frequencies are Ku-band (12-18 GHz) and Ka-band (26-40 GHz) for high-speed satellite internet and L-band (1-2 GHz) for GPS. Each satellite must coordinate its spectrum use to avoid interfering with signals in another channel. But spectrum alone is insufficient: satellites also need to occupy certain physical orbital positions so that their broadcasts reach antennae on the ground.

Megaconstellation boom

This scramble for spectrum and orbital slots has led to unprecedented satellite deployment. SpaceX's Starlink, launched in 2019, now operates over 8,000 satellites with plans for up to 42,000. OneWeb has 648 satellites, Amazon's Project Kuiper plans 3,200, and China's GuoWang has aimed for 13,000.

The value of the satellite megaconstellation market is thus projected to explode from $4.27 billion in 2024 to $27.31 billion by 2032, a 25.5% annual growth rate driven by demand for high-speed Internet in remote regions and dropping launch costs. The competition also transcends commercial markets; to countries outside the west, megaconstellations constitute a strategic push for technological sovereignty in space communications.

ITU governance

The ITU is a specialised agency of the United Nations with 194 member states. It serves as the sole global coordinator for satellite spectrum and orbital slots, operating under the principle that these are "limited natural resources that must be used rationally, efficiently and economically".

The ITU's first-come, first-served coordination system requires satellite operators to file frequency applications and coordinate with potentially affected administrations before receiving international recognition. This creates a competitive advantage for well-capitalised entities from spacefaring nations because they can file applications early and maintain the legal and technical expertise to navigate the lengthy coordination process. Late entrants risk finding the most valuable spectrum-orbital combinations already claimed.

The World Radiocommunication Conference 2023 introduced some reforms. Its Resolution 8 in particular requires operators to notify deviations between planned and actual orbital deployments, preventing companies from claiming one orbit while deploying elsewhere. The Conference also formalised expectations that if a company proposes to launch a megaconstellation, it must deploy 10% of it within two years, 50% within five years, and complete deployment in seven years.

The ITU's framework was designed for the 1960s-1990s satellite era and today faces mounting pressure. Its 2025-2029 operational plan identifies "spectrum and satellite orbits" as the top priority, acknowledging that traditional coordination mechanisms designed for hundreds of satellites are struggling to manage thousands of annual deployments. The body processes approximately 80% of satellite-related agenda items, a sign that satellite constellations dominate international spectrum management.

Digital divide

It's not possible to simply write off megaconstellations because they are one solution to bridging a connectivity disparity among the world's countries. For instance, on the Global Connectivity Index (a figure that combines the number of internet users, connected devices, natural-disaster vulnerability, and GDP), Switzerland leads with a score of 34.41 while India sits at 8.59, a nearly fourfold gap. Worldwide, 2.6 billion people remained offline at the start of 2025, with the most vulnerable populations in South Asia, Africa, and Latin America.

Satellite operators know that satellites in low-earth orbit (150-2,000 km above sea level) promise lower latency and higher bandwidth than traditional geostationary satellites (35,786 km above sea level). A latency of 20-40 ms, compared to 600+ ms for geostationary satellites, makes real-time applications like telemedicine and online education more feasible in remote regions, especially where ground-based infrastructure is out of the question.

The thorn here is affordability. Starlink's user terminal, which receives the satellites' transmissions, costs around $600 (₹53,168 on November 17) with monthly subscription fees, which is unaffordable for rural populations without subsidies or tiered pricing models. The ITU's 'Connecting Humanity Action Blueprint' has also estimated that closing the digital divide by 2030 will require $2.6-2.8 trillion in investments, underscoring the scale of the challenge.

For emerging spacefaring nations, this creates dual imperatives: securing spectrum access through the ITU's coordination system while ensuring connectivity translates to genuine affordability.

India exemplifies this situation. The GSAT-N2 satellite of the Indian Space Research Organisation has a throughput of 48 Gbps and covers remote regions, including the Andaman & Nicobar Islands and the Northeast, while Bharti Enterprises' 39% stake in OneWeb positions India within the global low-earth orbit ecosystem. However, the Telecom Regulatory Authority has recommended administrative spectrum allocation rather than auctions, recognising that spectrum for non-geostationary satellites can be shared when properly coordinated. This framework is designed to accelerate deployment while maintaining affordability.

Yet the fundamental tension remains: without regulatory mandates for universal service obligations or government subsidies, satellite broadband risks becoming premium infrastructure serving urban enterprises and wealthy households rather than bridging urban-rural divides.

The path onward

Thus the urgency of reform is clear. Current trajectories indicate operators around the world will launch more than 50,000 satellites by 2030. The Earth orbit hosts around 40,000 tracked objects, including over 27,000 pieces of debris larger than 10 cm.

The ITU adopted a resolution called ITU R 74 in 2023 calling for the sustainable use of spectrum and orbital resources, including measures to mitigate space debris. Notably, it requires satellites to be removed from orbit within 25 years of completing their missions to prevent defunct spacecraft from accumulating in orbit. Current compliance rates remain low, however, with at best 70% of satellite operators actually deorbiting their machines in this timeframe. This compliance gap means debris continues to accumulate faster than it is removed, threatening the long-term sustainability of orbital space.

As megaconstellations enter orbit, the overall success depends on governance frameworks that balance commercial innovation with scientific research, equitable access, and of course orbital sustainability. Without binding international standards and equitable allocation, the fight for spectrum could become a war, risking creating an orbital environment that is eventually too congested for anyone to use. For emerging space nations like India, shaping these frameworks now, rather than accepting rules written by other governments, will determine whether space becomes a shared resource or a domain of persistent inequality.

Shrawani Shagun is a researcher focusing on environmental sustainability and space governance.

CORE ANALYSIS

Why "Spectrum" is the New Battleground

UPSC-relevant concept: Spectrum governance + physics + ITU rules.

Satellite communication fundamentally depends on **radio frequency bands**, especially **L-band (1–2 GHz), Ku-band (12–18 GHz), and Ka-band (26–40 GHz)**.

These bands are finite and must be coordinated through the **International Telecommunication Union (ITU)** to avoid harmful interference.

Megaconstellations require not just spectrum but **specific orbital positions**, turning LEO into a congested and contested domain.

This creates a "first come, first served" advantage for deep-pocketed companies that can file early and fast, disadvantaging late entrants and developing nations.

Explosion of Megaconstellations and Commercial Stakes

Starlink alone operates **8,000+ satellites**, with permissions for **42,000**.

OneWeb (648), Kuiper (planned 3,200), China's GuoWang (13,000).

Global market value projected to rise from **$4.27 bn (2024)** to **$27.31 bn (2032)**.

ITU Governance Challenges and Reforms

The ITU, a UN agency with 194 members, coordinates:

Frequency filings

Orbital slot assignments

Interference resolution

Key governance issues:

The system was designed for **hundreds** of satellites, not **tens of thousands**.

Dominance of early-filing nations creates geopolitical inequities.

New **Resolution 8 (2023)** mandates:

Filing deviations must be reported.

Megaconstellations must deploy:

10% in 2 years

50% in 5 years

100% in 7 years

The ITU itself admits that traditional mechanisms are under immense pressure, processing **80% satellite-related agenda items**.

The Digital Divide Argument: Opportunity vs Inequality

Megaconstellations enable:

- Low latency (20–40 ms vs 600+ ms for geostationary satellites)
- High-bandwidth internet
- Connectivity in difficult terrains (mountains, islands, deserts)

But affordability is the limiting factor:

- Starlink's terminal costs **$600** (approx. ₹53,000) + monthly fees.
- ITU estimates **$2.6–2.8 trillion** needed globally to close the digital divide by 2030.

Thus, high-speed satellite internet risks becoming a premium service, not a public good, unless subsidised.

India's Position: Strategic Opportunity and Regulatory Balancing

India stands at a unique intersection:

- ISRO's **GSAT-N2** supports remote regions including the Northeast and Andaman & Nicobar.
- Bharti's 39% stake in **OneWeb** embeds India in the global LEO ecosystem.
- TRAI recommends **administrative spectrum allocation** (not auctions) for non-geostationary satellites, arguing spectrum can be shared if technically coordinated.

This approach tries to balance:

- Rapid deployment
- Cost reduction
- Equity in access

But without government-mandated **Universal Service Obligations (USO)** or subsidies, satellite broadband could remain urban-centric.

Sustainability Crisis: Debris, Crowding, and Orbital Risk

By 2030, over **50,000 satellites** are expected in orbit. Currently:

- 40,000 tracked objects
- 27,000+ debris pieces >10 cm
- ITU-R Resolution 74 (2023) requires **deorbiting within 25 years**, but compliance is only ~70%.

Consequences:

Higher risk of collisions (Kessler Syndrome)

Interference with astronomical observations

Threat to future launches

This makes **orbital sustainability** a core governance challenge.

CONCLUSION

The rapid rise of satellite megaconstellations marks a transformative moment in space governance. While they offer unprecedented opportunities to close connectivity gaps and drive global digital inclusion, they simultaneously amplify risks of **spectrum congestion, orbital crowding, inequitable access, and environmental degradation** in space. The current ITU frameworks, built for a bygone era, require urgent structural reform to ensure fairness, sustainability, and cooperation. For emerging space powers like India, the coming decade presents a decisive window: shaping international rules proactively will determine whether space remains a shared resource or becomes a fragmented and contested domain dominated by a few technological giants.

UPSC Mains Practice Question

Ques : The race for satellite spectrum and orbital slots reflects deeper issues of global digital inequality and technological sovereignty. Discuss. **(150 words)**

Is India's 8.2% growth rate sustainable?

India's GDP surged 8.2% to ₹48.63 lakh crore, indicating strong economic momentum. However, the IMF's 'Grade C' rating warns of structural weaknesses that could threaten long-term growth amidst global volatility and internal challenges

ECONOMIC NOTES

Deepanshu Mohan
Geetaali Malhotra

India's latest GDP figures position the Indian economy to be producing at a significantly higher level than last year, emphasised by the ₹48.63 lakh crore output projected to be realised in a single quarter.

The general state of the economy

An 8.2% increase of GDP indicates that this rise is part of a genuine momentum rather than just being a post-pandemic bounce. The 9.1% growth in manufacturing indicates that industrial demand has increased and factories are operating closer to capacity. Services, now 60% of India's GDP, is growing at 9.2%, with financial services at 10.2%, which reflects strong credit activity, higher transactions, and sustained urban demand.

The increase in real Gross Value Added (GVA) numbers from ₹82.88 lakh crore to ₹89.41 lakh crore further indicates that agriculture, industry and services are experiencing genuine rise in added value and not just rise in prices.

The real numbers held up because the nominal GDP increased by 8.8%, demonstrating that inflation remained under check. Moreover, Private Final Consumption Expenditure (PFCE) rising by 7.9% show that households are spending more. Further, the growth of agriculture by 3.5%, supported by fuller reservoirs and better horticulture output, points to a small but real improvement in rural incomes.

Inflation, which had been high for much of the previous years, finally eased and even slipped below target toward the end of 2024-25. Banks experienced significant credit growth and were in a position to lend with a clean balance sheet, maintaining capital buffers which are far in excess of regulatory requirements.

On the budget front, the Centre stuck to the path of consolidation with the help of strong GST and direct tax collections and successfully managed to keep the spending mix relatively high-quality. The external sector remained stable with a small current account deficit, healthy services exports and diversified foreign exchange reserves to weather global volatility.

And so, if one were to just look at these figures, it would appear that the Indian economy is moving forward even as much of the world slows down and is eclipsed in greater economic uncertainty.

The IMF's rating

Notwithstanding this, every headline has its shadow. Here, the shadow arrived in the form of a shocker when the International Monetary Fund (IMF) announced that India had been assigned 'Grade C' in its recent assessment on its national income accounting. There are four grades in total: A, B, C, and D.

Some of the multiple shortcomings highlighted by the IMF team which require careful consideration and review include – a) the use of an outdated base year (2011/12); b) the use of wholesale price indices as data sources for deflators due to the lack of producer price indices; c) the excessive use of single deflation, which may introduce cyclical biases; d) sizeable discrepancies between production and expenditure approaches that may indicate the need to enhance the coverage of the expenditure approach data and the informal sector; e) lack of seasonally adjusted data and room for improvement in other statistical techniques used in the quarterly national accounts compilation; and f) a lack of consolidated data on States and local bodies after 2019.

This raises a critical question: how can a nation possibly be underrated when it's racing at 8% while the world limps at 3%? But the truth lives in the footnotes of our own documents.

The RBI's Annual Report (2024-25) recognises that the economy has performed well, but it also quietly lays out the structural issues that still drag down India's credibility. Countries with discretionary exercises in projecting the good alone in numbers have two narratives: the one they tell the world and the one they whisper under their own breath. India's 8.2% is the story its government wants tell the world. The IMF's C is the whisper.

An economy appearing to grow fast is not the same thing as an economy growing well. What the IMF is really saying is that India's institutional bones are not yet as strong as its muscle.

Mining output was hit by an unusually long monsoon, while electricity generation slowed because of a milder-than-usual winter that reduced heating and peak-load demand. Although these might seem like fleeting weather phenomena, they significantly undermined the industrial base of the year. The unevenness is evident even in this strong quarter. Electricity and utilities grew only 4.4%, and mining barely moved at 0.04%. These are backbone sectors and subsequently their sluggishness signals that recovery is not evenly spread across the real economy. According to nominal GVA, the primary sector accounted for 14%, the secondary sector for 26%, and the tertiary sector for 60% in Q2.

These proportions look normal for a service-led economy, but India's case is different because its employment structure does not match its output structure: too many Indians still work in agriculture and low-wage services, sectors that contribute little to productivity gains.

Structural vulnerabilities

The RBI cautions that India's export trajectory will continue to be impacted by growing trade protectionism, tariff uncertainty, and geopolitical tensions in key markets.

Services exports and remittances help cushion the current account, but they cannot substitute for a diversified and scaled-up goods export engine – one that India still lacks.

Another contradiction shows up in the financial markets.

The rupee looked stable from a distance, but underneath, it was constantly being pushed down by a strong U.S. dollar and the usual swings in foreign capital.

When one realises that the IMF is grading the architecture that supports India's growth rather than the country's growth rate, its Grade C starts to make sense. A country can grow at 8% and still have structural vulnerabilities.

It can post healthy GVA numbers and still have weak institutional capacity at the State level, low labour productivity, and an export profile mismatched with global demand. GDP captures the pace of economic activity; it does not capture the quality of governance that sustains it. The true conflict is that, despite India's robust short-term economic momentum, its long-term framework is still being developed.

Even with the strong Q2 performance, broad-sector analysis shows agriculture growing only 3.5%, utilities at 4.4%, and mining barely above zero, sectors that collectively employ millions but contribute less and less to value creation.

This does not diminish the achievement of 8.2% growth. However, it makes the narrative more difficult. The IMF's grade serves as a subtle reminder to see past the quarterly glow and recognise the unresolved issues in economic structure, finance, and governance. India is leading the way. What it needs now is the depth.

Deepanshu Mohan is professor and dean, O.P. Jindal Global University and Director, Centre for New Economics Studies (CNES). He is a visiting professor at LSE and a visiting fellow at University of Oxford. Geetaali Malhotra is a research analyst with CNES.

GETTY IMAGES

THE GIST

- An 8.2% increase of GDP indicates that this rise is part of a genuine momentum rather than just being a post-pandemic bounce.
- The RBI's Annual Report (2024-25) recognises that the economy has performed well, but it also quietly lays out the structural issues that still drag down India's credibility.
- The RBI cautions that India's export trajectory will continue to be impacted by growing trade protectionism, tariff uncertainty, and geopolitical tensions in key markets.

GS 3 : Indian Economy

UPSC Mains Practice Question : India has recorded robust GDP growth of 8.2%, yet the IMF has assigned a 'Grade C' rating to its national income accounting system. In this context, critically examine whether India's current growth momentum is sustainable. Highlight the structural and institutional challenges that may threaten long-term growth. **(250 words)**

Context :

India has reported 8.2% real GDP growth and a quarterly output of ₹48.63 lakh crore, signalling strong economic momentum driven by manufacturing, services, consumption, and moderated inflation. Yet, the IMF's 'Grade C' rating for India's national accounts framework exposes weaknesses in data quality, institutional capacity, and structural underpinnings of growth.

This contrast between high growth numbers and weak statistical architecture raises the central policy question: Is India's current growth surge sustainable in the medium to long term?

Key Economic Signals from the Growth Numbers

1. Broad-Based Output Expansion

Manufacturing grew 9.1%, indicating stronger capacity utilisation.

Services grew 9.2%, with financial services at 10.2%, reflecting credit momentum and urban demand.

Agriculture grew 3.5% due to better reservoir levels and horticulture output.

2. Consumption and Inflation Dynamics

PFCE up 7.9% → private consumption revival.

Nominal GDP up 8.8% vs real 8.2% → inflation under control.

Banks show healthy credit growth and strong balance sheets.

3. Fiscal and External Stability

High-quality expenditure mix achieved despite fiscal consolidation.

Strong GST + direct tax growth supported Centre's budget management.

Current account deficit modest, services exports strong, forex reserves diversified.

Why IMF Gave India a Grade C

Despite strong growth, IMF has highlighted structural weaknesses in data quality and statistical practices, including:

Old GDP base year (2011–12)

Reliance on WPI due to lack of producer price index

Overuse of single deflation → cyclical bias

Large discrepancies between expenditure and production GDP

Invisible informal sector in national accounts

No consolidated State/Local body finances after 2019

Absence of seasonal adjustment in quarterly data

Structural Vulnerabilities Limiting Long-Term Sustainability

1. Employment–Output Mismatch

Services contribute 60% to GDP, but employ far less than agriculture.

Agriculture still employs 40%+ workforce with <15% GDP share.

This misalignment depresses productivity and limits equitable growth.

2. Uneven Sectoral Recovery

Mining grew 0.04%, utilities at 4.4% → weak core sectors.

Weather-related disruptions (long monsoon, mild winter) exposed fragility.

3. External Sector Constraints

Rising global protectionism, tariff uncertainty, geopolitical tensions.

Services exports + remittances cannot replace weak goods exports.

India lacks a scaled-up manufacturing export engine comparable to East Asian economies.

4. Rupee Stability Masking Structural Stress

Rupee appears stable but is continually pressured by a strong dollar and volatile FPI flows.

Significance: Dependence on external capital, not domestic competitiveness, holds currency stability.

5. Institutional Weaknesses

Weak statistical systems → undermines credibility of growth numbers.

Poor State-level data → weak fiscal federalism and planning.

Low labour productivity → persistent structural bottlenecks.

IMF's "Grade C" is essentially a caution on the quality of institutions supporting India's growth story.

Is India's Growth Sustainable?

Short-Term Outlook: Relatively Strong

Macroeconomic stability (low inflation, high tax buoyancy).

Robust consumption and investment indicators.

Strong financial sector fundamentals.

Services-led growth momentum.

Medium to Long Term: Conditional

Sustainability depends on resolving key structural issues:

Statistical system reform (new base year, PPI, better coverage).

Labour productivity and employment diversification.

Strengthening manufacturing and exports.

Better quality of State and local finances.

Reducing dependence on external capital for currency stability.

Conclusion:

India's 8.2% growth is real but not fully secure. The momentum is strong, but the foundations need strengthening. The IMF rating is not an indictment of India's growth rate but a reminder that high growth must rest on credible institutions, balanced sectoral performance, and robust data systems. India's challenge is no longer speed but depth.