AXIA IAS ACADEMY

- DAILY NEWS ANALYSIS
- MARCH 4
- CONSISTENT COMPREHENSIVE AND CREDIBLE
- UNIQUE AND BEST IN QUALITY

Battered Iran attacks economic targets

Tehran strikes U.S. embassies in Saudi, Kuwait; energy facilities in the region come under attack

Israel bombs remaining Iranian leadership, troops push deeper into Lebanon, targeting Hezbollah

President Trump says he has rebuffed attempt by Tehran to open negotiations as coming 'too late'

Agence France-Presse
DUBAI

Iran stepped up its attacks on economic targets and U.S. missions across West Asia on Tuesday as U.S. President Donald Trump said the U.S.-Israel strikes have inflicted wide damages on the Islamic Republic while warning it was "too late" for it to seek talks to escape the war.

As drones and missiles crashed into oil facilities and U.S. embassies in the region, Washington's ally Israel bombarded targets in Iran and pushed troops deeper into Lebanon to battle the Tehran-backed militia Hezbollah.

Loud explosions were heard in Iraq's Erbil and across cities of Doha, Dubai, and Abu Dhabi in the UAE on Tuesday night, which Dubai authorities said were caused by "interception operations" by air defence forces.

Tuesday's attacks came after Iran widened its targets in the war in its fourth day to include infrastructure in Saudi Arabia, the UAE, and Qatar – where the state-run energy firm suspended LNG production, sending European energy prices skyrocketing.

An attack from two drones on the U.S. Embassy in Riyadh caused a "limited fire", according to Saudi Arabia's Defence Ministry, and the embassy urged Americans to avoid the compound. It followed an attack on the U.S. Embassy in Kuwait, that announced it had been closed until further notice.

Attack warning

The embassy in Riyadh on Tuesday warned of an imminent attack in the eastern city of Dhahran, home to much of the Saudi Arabia oil and gas installations.

U.S.-Israeli strikes have hit more than 900 locations in Iran since the start of the conflict, killing at least 787 people, according to the Iranian Red Crescent Society.

U.S. and Israeli strikes also targeted the building housing the committee that is to elect Iran's new Supreme Leader, Iranian media reported. The strikes also caused damage at an airport in Bushehr, a port city that also hosts a nuclear power plant, the Mehr news agency reported.

"The military has launched a ninth wave of strikes in Tehran. The Air Force has now begun a large-scale wave of strikes targeting the Iranian terror regime's infrastructure in Tehran," the Israeli military said. "Their air defence, air force, navy, and leadership is gone. They want to talk. I said: 'Too late'," Mr. Trump said.

"Just about everything's been knocked out," Mr. Trump said as he met German Chancellor Friedrich Merz, answering his first questions from reporters since the strikes began on Saturday.

The conflict escalated further on its fourth day, with Israel ordering the military to take control of more positions inside Lebanon to create a buffer zone, as the Lebanese Army pulled back some of its forces after Hezbollah attacked Israeli bases.

Israel sent troops into Lebanon on Tuesday and warned residents of over 80 villages to evacuate as the Iran-backed militant Hezbollah group said it was ready for an "open war" with Israel.

The Israeli military said it had struck more than 160 targets of the militant group. The Lebanese government had banned military activities by Hezbollah on Monday after it opened fire on Israel in retaliation for the killing of Iran's Supreme Leader. At least 40 people have been killed in Israeli attacks on Lebanon on Monday and Tuesday, a spokesperson for Lebanon's Health Ministry said.

Lebanese authorities said more than 58,000 people have been forced to flee their homes.

Tehran's UN ambassador said on Tuesday the U.S. made a "totally stupid decision" to attack Iran while in talks, and betrayed Gulf nations by trashing diplomatic efforts in West Asia with Israel and U.S. launching strikes on Iran inviting retaliatory attacks by Tehran on Washington's regional allies.

The sources added India was "comfortably placed" with respect to liquefied natural gas (LNG) and liquefied petroleum gas (LPG). India had sufficient LNG supplies for the next two to three weeks.

In a press statement, the Petroleum and Natural Gas Ministry said it established a 24X7 control room to monitor the supply and stock position.

"At present, the Government is reasonably comfortable in terms of stocks. Safeguarding interests of Indian consumers is the highest priority," the Ministry said.

Grey horizon: A tall plume of black smoke rises following an explosion in the UAE's Fujairah industrial zone on Tuesday. AFP

Embassy urges Indians in Iran to 'stay indoors'

Press Trust of India
NEW DELHI

India on Tuesday advised its nationals in Iran to exercise utmost caution and remain indoors as far as possible as the security situation in the West Asian nation deteriorated in view of fresh military strikes by the U.S. and Israel. "In view of the developing situation, all Indian nationals in Iran are advised to exercise utmost caution, avoid unnecessary movements and remain indoors as far as possible," the Indian Embassy in Tehran said in a fresh advisory.

"Indians may also continue to monitor the news, maintain situational awareness and await any further guidance from the Embassy of India," it said.

'India has crude oil stocks for 25 days'

Saptaparno Ghosh
NEW DELHI

India has sufficient stocks of crude oil and energy products (petrol and diesel) for the next 25 days each, cumulatively accounting for 50 days of sufficiency, sources in the government said.

"We are in a reasonably comfortable position as far as crude oil is concerned," a source said, adding, "We have crude oil in reserve for 25 days alongside energy products for 25 days."

The source said the crude reserve does not include that from the emergency-earmarked Special Petroleum Reserve (SPR).

Concerns over India's fuel stock position emerged as tensions rose

Airlines operating over 12 special flights

Press Trust of India
MUMBAI

More than 250 flights were cancelled at Delhi, Mumbai, Bangalore and Chennai on Tuesday

Indian airlines, including IndiGo, Air India, Air India Express and SpiceJet, are operating over 12 special flights to various cities in Saudi Arabia and the UAE to bring back passengers stranded due to the escalating conflict in West Asia.

Air India Express resumed its services to Muscat (Oman) on Tuesday, and IndiGo will restart services to Muscat, and Jeddah and Medina in Saudi Arabia on Wednesday.

Air India operated two special relief flights to Jeddah and Dubai on Tuesday, and will operate another such flight to Dubai from Mumbai on March 4.

On Tuesday, Air India Express operated three special flights – Dubai-Bangalore, Abu Dhabi-Delhi and Sharjah-Mumbai.

IndiGo said it was operating four repatriation flights to Jeddah.

Meanwhile, more than 250 flights were cancelled at the Delhi, Mumbai, Bangalore and Chennai airports on Tuesday, officials said.

- **Key Terms and Explanations**
- **Asymmetric Warfare:** A conflict where the relative military power of belligerents differs significantly, leading the weaker party to use unconventional tactics (e.g., Iran using drones/proxies against high-value economic targets).
- **Buffer Zone:** A neutral zonal area between two or more bodies of land, usually to prevent conflict. Israel's push into Lebanon aims to create a physical space to prevent Hezbollah from launching direct ground or short-range attacks.
- **Energy Security:** The uninterrupted availability of energy sources at an affordable price. The suspension of LNG production in Qatar directly threatens the energy security of importing nations in Europe and Asia.
- **Strategic Straits & Hubs:** Locations like the Port of Fujairah (UAE) or the Strait of Hormuz. These are "chokepoints" where an attack can paralyze global trade.
- **Proxy Warfare:** A war instigated by a major power that does not itself become involved. Hezbollah (Lebanon) and the Houthis (Yemen) are often cited as Iranian proxies.

- **Main Arguments and Substantive Parts**
- **Shift from Military to Economic Targets:** Iran has pivoted toward attacking global energy infrastructure (Saudi, UAE, Qatar) and diplomatic missions to raise the "cost of war" for the international community.
- **Decapitation of Leadership:** Israel's strategy focuses on neutralizing the "head of the snake"—targeting the Iranian leadership and the committee responsible for choosing the Supreme Leader—to trigger internal collapse.
- **The "Too Late" Diplomacy:** The U.S. administration has adopted a hardline stance, rebuffing negotiations. The argument is that once a regime's strategic assets are destroyed, diplomacy is no longer a tool of parity but of surrender.
- **Regional Spillover:** The conflict is no longer contained to Israel-Gaza or Israel-Lebanon; it now involves the direct targeting of sovereign Gulf nations and U.S. assets in Kuwait and Saudi Arabia.

- **Historical Evolution of the Issue**
- **1979 Islamic Revolution:** The foundational shift in Iran-U.S. relations, turning Iran from a key regional ally to a "revisionist state" opposed to Western influence.
- **The "Shadow War" (Post-2000s):** Decades of cyber-attacks, assassinations of nuclear scientists, and proxy skirmishes in Syria and Yemen.
- **JCPOA (2015) and Withdrawal (2018):** The nuclear deal attempted to integrate Iran into the global economy, but the U.S. withdrawal led to "Maximum Pressure" sanctions, setting the stage for the current desperation.
- **The 2023-2024 Escalation:** Following the October 7 attacks, the "Axis of Resistance" (Hezbollah, Hamas, Houthis) synchronized their efforts, leading to the current direct confrontation between Israel and Iran.

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West Asia Escalation: The Shift to Economic Warfare & Its Global Ripple Effects

The West Asian conflict has pivoted from traditional military skirmishes to high-stakes economic warfare. Iran is targeting global energy chokepoints and diplomatic missions, while Israel and the U.S. pursue a "decapitation strategy" against Iranian leadership, creating a multi-front crisis that threatens global markets and India's strategic autonomy.

THE NEW MECHANICS OF ESCALATION

LEADERSHIP DECAPITATION

Regime Decapitation Strategy:
Israel and U.S. strikes target leadership succession committees to paralyze the Iranian state's decision-making.

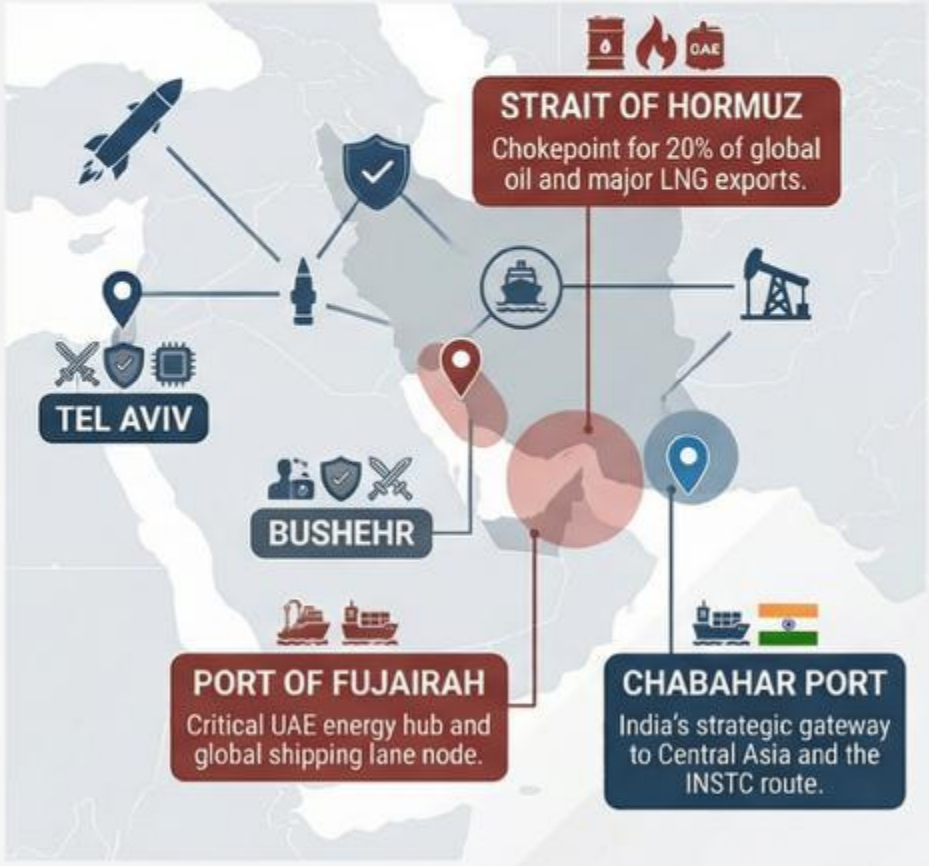
ECONOMIC WARFARE

- **Shift to Economic Chokepoints:** Iran is targeting LNG facilities (Qatar) and oil hubs (UAE/Saudi) to maximize global economic leverage.

PROXY SKIRMISHES

The "Too Late" Diplomacy:
U.S. rebuffing of negotiation attempts signals a move from containment toward a "regime rollback" stance.

GEOPOLITICAL FLASHPOINTS & STRATEGIC SIGNIFICANCE



THE INDIA-CENTRIC "TRIAD" OF IMPACT

80%

CRUDE OIL VULNERABILITY:
Massive rellance on West Asian imports makes India highly succeptible to "imported inflation" during conflict.

9 Million

DIASPORA AT RISK:
Escalation threatens the safety of Indian workers and the flow of vital foreign exchange remittances.

THE BALANCING ACT:
India must navigate a "Strategic Partnership" with Israel/U.S. while maintaining energy-critical lies with Iran.

- **Linkages with NCERTs**
- **Class 12 Political Science (Contemporary World Politics):** Chapters on "US Hegemony" and "Conflicts in South Asia/Middle East."
- **Class 12 Geography (India and the World):** Energy resources and global trade routes (Strait of Hormuz).
- **Class 10 History:** Concept of Nationalism and the evolution of nation-states.

- **Way Forward**
- **Backchannel Diplomacy:** Even if public talks are "too late," private channels (via Oman or India) are essential to prevent nuclear escalation.
- **Energy Diversification:** For countries like India and Germany, this is a signal to accelerate the transition to renewables to reduce vulnerability to West Asian volatility.
- **UN Intervention:** Reinvigorating the UN Security Council to enforce a ceasefire in Lebanon to prevent a total regional collapse.
- **Protection of Commons:** International agreement to designate energy infrastructure as "off-limits" in regional conflicts to protect the global economy.

2,000-year-old Megalithic rock-cut chamber comes to light in Kasaragod

The Hindu Bureau
KASARAGOD

A laterite rock-cut chamber, believed to be nearly 2,000 years old and linked to the Megalithic period, was unearthed on Sunday during excavation work for the construction of a compound wall at Panayal in Kasaragod district of Kerala.

The structure was discovered on a private property. Nandakumar Koroth, archaeologist and faculty member of the History department at Nehru Arts and Science College, Kanhangad, inspected the site and confirmed that the find is a Megalithic laterite rock-cut chamber.

The laterite rock-cut chamber was discovered at Panayal in Kasaragod during construction work. SPECIAL ARRANGEMENT

Mr. Koroth said the circular inner chamber had been carved out of laterite rock, with its entrance sealed by a stone slab. A circular aperture of around five cm in diameter is seen at top, designed to allow a person to descend into the chamber. A shaft, around three feet deep, leads to circular burial chamber. As the interior is filled with soil, no urns or artefacts are presently visible.

Megalithic communities dug such chambers by interring pottery as part of ritual belief systems. Locally, these chambers are known as 'Muniyara', 'Pandava cave', 'Peeranki cave', 'Nidhikuzhi', and 'Kalppathayam'.

K. Krishnaraj, archaeologist and officer in charge of the Pazhassi Raja Archaeological Museum, said further excavation will be done in the coming days. "We are expecting that there will be materials and evidence, which will shed light on the past," he said.

Several umbrella stones, another Megalithic monument, have been discovered in the nearby areas.

- **Key Terms and Explanations**
- **Megalith (Mega = Large; Lith = Stone):** These are large stone structures used to mark burial sites or commemorate events.
    - *Example:* Think of them as "stone-age monuments" that served as permanent markers for the deceased.
- **Laterite Rock:** A soil and rock type rich in iron and aluminum, common in tropical areas like Kerala. It is soft when first quarried but hardens when exposed to air, making it perfect for carving chambers.
- **Rock-cut Chamber:** A tomb excavated directly into the bedrock. In Kerala, these often have a central pillar and side benches for placing funerary offerings.
- **Secondary Burial:** A practice where the body is left to decompose elsewhere, and then the bones are collected and placed in an urn or chamber.
- **Slab-cist / Capstone:** A large flat stone used to seal the entrance or top of a burial chamber to protect the contents from the elements.

- **Main Arguments and Substantive Parts**
- The core significance of this discovery lies in its **structural integrity** and its **location**.
- **Structural Sophistication:** The presence of a 3-foot shaft and a circular aperture suggests a highly organized engineering capability. It wasn't just a hole in the ground; it was a planned architectural space.
- **Ritualistic Belief Systems:** The seal of the stone slab and the specific design for entry indicate a belief in the afterlife. The "soil-filled interior" suggests that while we can't see urns yet, the chamber was intended to house "grave goods" (pottery, iron tools) to assist the deceased in the next world.
- **Regional Density:** The mention of "Umbrella Stones" (*Kudaikkal*) nearby suggests that Panayal was a significant settlement or a sacred necropolis for Megalithic communities.

- **Historical Evolution of the Issue**
- **Pre-Independence (19th Century):** Early British officers like **Babington** first described Megalithic sites in Malabar (1823), bringing "Pandukulis" (local name for these caves) to academic notice.
- **Post-Independence:** The **Archaeological Survey of India (ASI)** and state departments systematically mapped sites like Brahmagiri and Adichanallur, establishing a timeline (roughly 1200 BCE to 300 CE).
- **Modern Era:** Discoveries like this one in Panayal highlight the shift from "surface surveys" to "accidental excavations" caused by rapid urbanization and construction, posing a challenge for heritage conservation.

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Unlocking the Iron Age: Kerala's 2,000-Year-Old Megalithic Discovery

A 2,000-year-old rock-cut chamber in Panayal, Kasaragod, carved into laterite bedrock, links South India's Iron Age to the Sangam Era, revealing advanced engineering and evolving social hierarchies.

UPSC Relevance:
Essential for GS Paper 1 & History Optional

ANATOMY OF THE PANAYAL CHAMBER

Engineering the Underground

3-foot vertical shaft leading to a circular chamber sealed by a stone slab.

The 'Soul Hole' Aperture

5cm circular top opening used for secondary burials or ritual offerings over time.

Laterite Mastery

Soft when quarried but hardens on air exposure, making it the perfect ancient construction material.

SOCIO-HISTORICAL SIGNIFICANCE

Indicator of Social Stratification

Massive labor requirements suggest a shift from egalitarian tribes to organized chiefdoms.

Philosophy of Ancestor Worship

The use of permanent stone markers reflects a desire for the deceased to remain present.

Link to the Sangam Era

Acts as a bridge to understanding early South Indian spiritual and territorial structures.

Archaeological Feature	Rock-cut Chamber	Surface Stone	Circular Opening
Local Cultural Name	Muniyara (Sage's Abode)	Umbrella Stone (Kudakkallu)	Nidhikuzhi (Treasure Pit)
Historical Interpretation	Funerary burial vault for elites.	Sacred landscape markers.	Ritual aperture for multiple interments.

Linkages with NCERTs

Class 6 History (Our Pasts-I): Chapter "What Books and Burials Tell Us" – specifically the section on Megaliths.

Class 12 History (Themes in Indian History-I): Chapter 2, "Kings, Farmers and Towns," which discusses the socio-economic impact of the Iron Age.

Way Forward

Digital Mapping: Use LiDAR and Ground Penetrating Radar (GPR) in Kasaragod to find more chambers without digging.

Private-Public Partnership: Incentivize private landowners to report finds through tax breaks or "Heritage Guardian" certificates.

Museum Integration: Relocate portable artifacts to the **Pazhassi Raja Museum** while preserving the chamber *in-situ*.

Centre inks ₹5,000-cr. deal to strengthen maritime security

Coast Guard to get six ALH Mk-III helicopters from HAL; Russian Shtil missiles to be installed on Navy's frontline warships; acquisitions aim to enhance air defence and generate job opportunities

Saurabh Trivedi
NEW DELHI

The Defence Ministry on Tuesday signed contracts worth ₹5,083 crore for the acquisition of six Advanced Light Helicopters Mk-III (maritime role) for the Indian Coast Guard and Shtil surface-to-air vertical launch missiles for the Indian Navy.

The contract for the six choppers, along with operational role equipment, an engineering support package, and performance-based logistics support, valued at ₹2,901 crore, has been signed with Hindustan Aeronautics Ltd.

Winged watch: The ALH Mk-III choppers will enhance protection of artificial islands and offshore installations. L. BALACHANDAR

Indigenous push

The purchase comes under the category of indigenously designed, developed, and manufactured products, the Ministry said.

The twin-engine helicopters incorporate state-of-the-art features superior to the airborne platforms currently in operation, and are capable of undertaking a wide spectrum of maritime security missions from shore-based airfields as well as from ships at sea.

Their induction is expected to significantly enhance the Indian Coast Guard's capability to ensure the safety and protection of artificial islands, offshore installations, and fishermen, as well as safeguarding the marine environment, the Ministry said. The project envisages supply of equipment from more than 200 MSMEs and is expected to generate approximately 65 lakh man-hours of employment.

The contract reinforces the government's commitment to Aatmanirbhar Bharat, or resilient India, and the Make-in-India initiative, while strengthening the country's maritime security architecture, it added.

Separately, the contract for the procurement of Shtil missiles and associated missile holding frames, valued at ₹2,182 crore, has been signed with JSC Rosoboronexport, a state-run company of the Russian Federation.

The acquisition is aimed at substantially enhancing the air defence capabilities of warships on the front line against a wide spectrum of aerial threats, the Ministry said.

Rapid reaction

The system will bolster the layered air defence architecture aboard Indian Navy platforms by providing rapid-reaction, all-weather engagement capability and improved survivability in contested maritime environments. The contract underscores the long-standing defence partnership between India and Russia.

The contracts were inked in the presence of Defence Secretary Rajesh Kumar Singh at South Block in New Delhi.

Key Terms and Explanations

ALH Mk-III (Maritime Role): A specialized version of the Advanced Light Helicopter "Dhruv." Unlike the standard version, the Mk-III maritime variant is equipped with sensors and weapons specifically for sea operations, such as radar and electronic warfare suites.

Shtil Surface-to-Air Missile (SAM): A Russian-origin vertical launch missile system designed to protect ships from aerial attacks (missiles, aircraft, drones). "Vertical launch" means the missile fires upward and then tilts toward the target, allowing for a 360-degree defense coverage.

Maritime Security Architecture: The combined framework of physical assets (ships, planes), legal structures (UNCLOS), and personnel that work together to protect a nation's interests at sea.

Aatmanirbhar Bharat (IDDM): Stands for "Indigenously Designed, Developed, and Manufactured." This is the highest priority category in India’s Defence Acquisition Procedure (DAP), favoring products with high local content.

MSMEs (Micro, Small, and Medium Enterprises): Small-scale industries that form the backbone of the supply chain. In this deal, over 200 MSMEs provide the nuts, bolts, and specialized components for the helicopters.

- **Main Arguments and Substantive Parts**
- The core thesis of this development is the **simultaneous modernization of the Coast Guard and the Navy** to create a "layered defense" system.
- **Coast Guard Strengthening:** By adding six ALH Mk-III choppers, the Coast Guard moves from being a "reactive" force to a "proactive" one. These assets are vital for patrolling Exclusive Economic Zones (EEZ) and protecting offshore assets like Bombay High.
- **Naval Lethality:** The Shtil missiles provide "Hard Kill" capability. While the Coast Guard focuses on policing and SAR (Search and Rescue), the Navy’s frontline warships need these missiles to survive in high-intensity conflict zones.
- **The Economic Multiplier:** A major argument presented is that defense spending isn't just an "expense." With 65 lakh man-hours of employment projected, it acts as a stimulus for the manufacturing sector.

- **Historical Evolution of the Issue**
- **Post-1971 Era:** The 1971 war highlighted the need for a dedicated Coast Guard (established in 1978) to relieve the Navy of policing duties.
- **Post-26/11 Mumbai Attacks:** This was a watershed moment. It exposed the "cracks" in maritime surveillance, leading to a massive overhaul of coastal radar chains and the induction of faster, more capable aerial platforms.
- **The Transition from Import to Indigenization:** For decades, India was the world’s largest arms importer. The shift toward the "Make in India" initiative (2014 onwards) changed the focus from buying "off-the-shelf" to domestic co-development.

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INDIA'S MARITIME MODERNIZATION:
The Dual-Track Strategy of Aatmanirbhar Bharat

A Strategic & Economic Analysis for UPSC Aspirants

PILLAR 1: INDIGENOUS CAPABILITY
(Indian Coast Guard)

TOTAL DEAL VALUE: ₹5,083 CRORE

ALH Mk-III: The Eyes of the EEZ

Advanced Light Helicopters designed by HAL for proactive patrolling of Exclusive Economic Zones.

THE ECONOMIC MULTIPLIER EFFECT

INCLUSION OF 200+ MSMEs generating **65 LAKH MAN-HOURS** of high-skilled manufacturing employment.

PERFORMANCE-BASED LOGISTICS (PBL)

A shift from 'buying machines' to 'buying availability,' ensuring higher operational readiness.

PILLAR 2: STRATEGIC LETHALITY
(Indian Navy)

FINANCIAL & INDUSTRIAL SCOPE

ALH MK-III (Coast Guard)	SHTIL MISSILE (Navy)
ORIGIN: Indigenous (HAL)	**ORIGIN:** Russian (Rosoboronexport)
PRIMARY ROLE: Surveillance & SAR	**PRIMARY ROLE:** Ship-borne Air Defense
ECONOMIC IMPACT: ₹2,901 Cr Domestic Circulation	**ECONOMIC IMPACT:** ₹2,182 Cr Capital Outflow

Dual-Track Approach: Achieving 'Strategic Autonomy' via domestic production while maintaining 'Pragmatic Realism' through critical foreign partnerships.

MID-LIFE LETHALITY UPGRADES

Integrating modern vertical launch systems onto existing warships to extend their relevant combat life.

PRAGMATIC STRATEGIC AUTONOMY

Balancing the Russian partnership with domestic goals to fill immediate 'hard-kill' capability gaps.

- **Linkages with NCERTs**
- **Class 12 Political Science:** *Contemporary World Politics* (Chapter on Security) – Discusses traditional and non-traditional threats.
- **Class 11 Geography:** *India: Physical Environment* – Understanding the vastness of the Indian coastline (7,516 km) and why maritime security is a geographical necessity.

- **Way Forward**
- **Strict Timelines:** Establish a "War Room" within the Ministry of Defence to monitor HAL's production schedule to avoid cost overruns.
- **Diversification:** While the Shtil deal is necessary, India must accelerate the indigenous "Seahawk" or "LR-SAM" projects to reduce future dependence on Russia.
- **MSME Integration:** Create a digital dashboard for the 200 MSMEs involved to ensure seamless supply chain management.

‘Freedom to dissent also part of Judicial independence’

Krishnadas Rajagopal
NEW DELHI

‘Judicial independence’ was not limited to insulation from political pressure, institutional intimidation, or popular demand, but extended to every individual judge’s autonomy to disagree or diverge from the opinions of his or her colleagues in the court, Supreme Court judge B.V. Nagarathna said on Tuesday.

“Judicial independence is not exhausted by insulation from the political branches. It also requires that each judge be free to form and express his or her own considered view of the law, even when that view diverges from colleagues,” Justice Nagarathna said in an address at the Kerala High Court.

Justice Nagarathna, who is in line to be the first woman Chief Justice of India in 2027, is widely respected for her lone dissents, including on the Constitution Bench in the demonetisation case, and her objection in the Supreme Court Collegium to the recommendation for appointment of a judge to the top court in 2025.

Intellectual autonomy

The judge said separate and dissenting opinions were manifestations of intellectual autonomy, and these expressions, given without fear or favour for the sake of institutional integrity alone, was the “independence of the judiciary in its most enlightened form.”

“A judicial opinion is not a negotiation document; it is an articulation of constitutional conviction. If the law, as we understood it, requires clarity – even bluntness – then dilution for the sake of consensus is a form of compromise we should be unwilling to make,” Justice Nagarathna said in her Justice T.S. Krishnamoorthy Iyer Memorial Oration.

Besides independence from external influence, judicial independence also operated subtly from within the judicial institution, she said.

> “Judicial independence is not exhausted by insulation from the political branches. It also requires that each judge be free to form and express his or her own considered view of the law
>
> **B.V. NAGARATHNA**
> Supreme Court judge

Justice Nagarathna underscored that judicial review must be underwritten by judicial independence. Judicial review frequently required courts to invalidate legislation, restrain executive action or even set aside constitutional amendments enacted by political majorities.

“These are not easy tasks. They often carry political consequences. Even if judges know that unpopular decisions may cost them elevation, extension, or bring them in the bad books of the powers that be. That should not come in the way of their decisions,” Ms. Nagarathna said.

The Supreme Court judge referred to Justice H.R. Khanna’s solo dissent in the ADM Jabalpur case to protect personal liberty in the time of the Emergency even at the ultimate cost of his Chief Justiceship of India. She emphasised that security of tenure insulates judges from retaliation. She noted that transparent and structured appointment processes of judges reduced partisan capture while institutional autonomy, both administrative and financial, prevented indirect nudges of pressure.

“These safeguards do not make judges infallible, but they make principled adjudication possible,” Justice Nagarathna said.

- **Key Terms and Explanations**
- **Judicial Independence:** Traditionally understood as the judiciary's freedom from the executive and legislature. In this context, it is expanded to include a judge's freedom from **internal peer pressure** or the need for a forced consensus.
- **Dissenting Opinion:** A legal opinion written by one or more judges expressing disagreement with the majority view of the court.
    - *Example:* In the **Demonetisation Case (2023)**, while the majority upheld the move, Justice Nagarathna dissented, arguing the process was flawed.
- **Constitutional Conviction:** The belief that a judge's primary loyalty is to the Constitution's values, rather than to institutional harmony or political popularity.
- **Security of Tenure:** A safeguard ensuring judges cannot be removed from office easily (except through impeachment), allowing them to make "unpopular" decisions without fear of losing their jobs.
- **Judicial Review:** The power of the courts to examine the actions of the legislative, executive, and administrative arms of the government and determine whether such actions are consistent with the Constitution.

- **Main Arguments and Substantive Parts**
- The core thesis is that **"The right to disagree is the highest form of judicial independence."**
- **Internal vs. External Independence:** Independence isn't just about blocking a phone call from a politician; it’s about a judge not feeling pressured by their own colleagues to "go along to get along."
- **Non-Negotiable Law:** A judicial opinion is not a "negotiation document." Diluting a legal stance just to reach a 5-0 or 7-0 unanimous verdict is seen as a compromise on legal clarity.
- **The "Cost" of Dissent:** The argument acknowledges that dissenters often face "costs"—missing out on promotions or being sidelined. However, the integrity of the law must outweigh personal career progression.
- **Safeguarding Personal Liberty:** Using the example of Justice H.R. Khanna, the argument posits that a lone dissent during a national crisis (like the Emergency) can become the "beacon of light" for future generations.

- **Historical Evolution of the Issue**
- **Pre-Independence:** The Federal Court of India saw rare dissents, often following British traditions of "seriatim" (individual) opinions.
- **The Post-Independence Era:** Initially, the Indian Supreme Court strove for consensus to build institutional authority.
- **The Turning Point (1976):** *ADM Jabalpur v. Shivkant Shukla*. Justice H.R. Khanna's dissent against the suspension of Habeas Corpus during the Emergency is the gold standard for judicial courage. He was superseded for the post of CJI because of it.
- **Modern Era:** We see an increase in "Strong Dissents" in high-profile cases (Aadhaar, Demonetisation, Same-Sex Marriage), showing a judiciary that is intellectually pluralistic.

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The Power of Dissent:
The Soul of Judicial Independence

THE TWO DIMENSIONS OF INDEPENDENCE

EXTERNAL INDEPENDENCE
(Freedom from State)

Freedom from executive/legislative control

INTERNAL INDEPENDENCE
(Freedom from Peers)

A judge's freedom from peer pressure

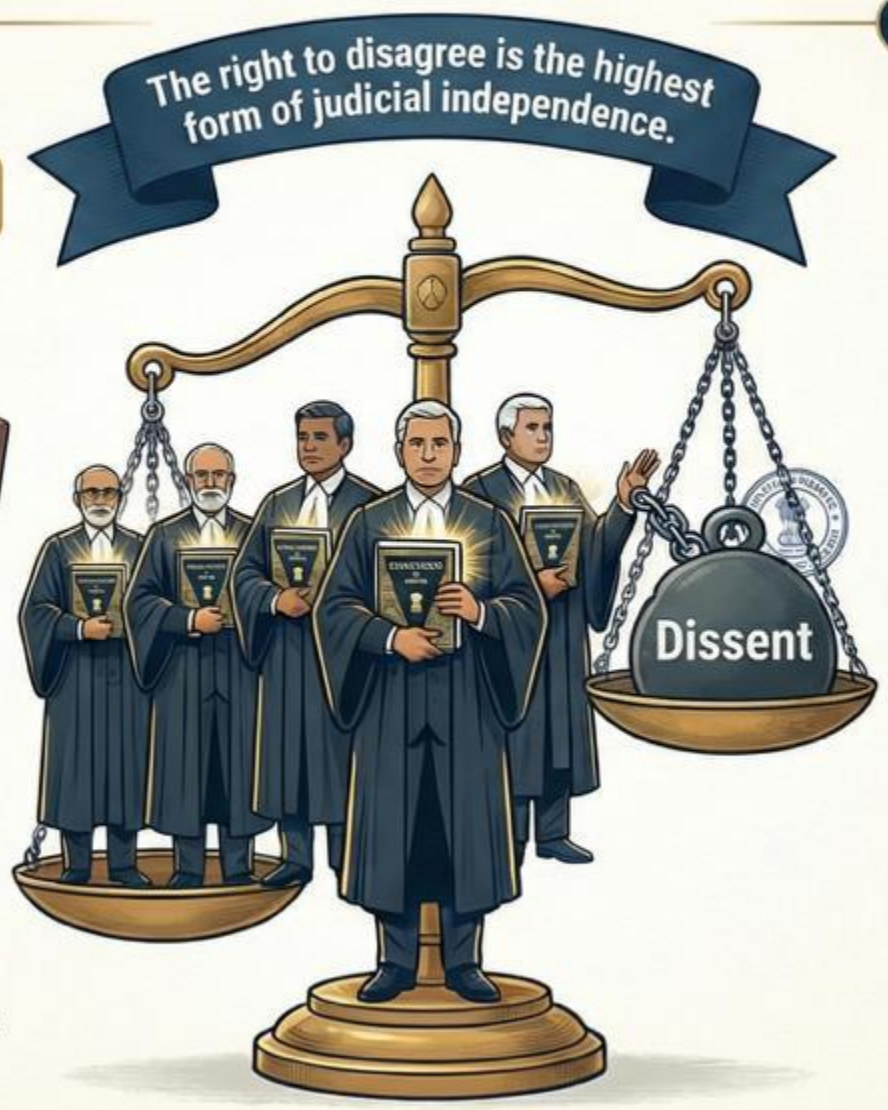
> "A judicial opinion is an articulation of constitutional conviction."
> – Justice Khanna

CONSTITUTIONAL SAFEGUARDS

- Security of tenure
- Article 145(5) expressly allow and protect the right to record dissent.

NOT A 'NEGOTIATION DOCUMENT'

- Judicial opinions should be articulations of conviction, not watered-down compromises to reach unanimity.



DISSENT AS THE 'LAW OF TOMORROW'

THE GOLD STANDARD: ADM JABALPUR (1976)

Justice H.R. Khanna's lone dissent for Habeas Corpus became a **"beacon of light"** for future democracy.

MODERN PLURALISM: THE 2023 CASES

Demonetisation Case

Same-Sex Marriage Case

Strong dissents in the **Demonetisation** and **Same-Sex Marriage** cases reflect a healthy, intellectually diverse judiciary.

SAFETY VALVE FOR DEMOCRACY

Dissent keeps the majority honest and prevents intellectual stagnation within the legal system.

THE WEIGHT OF JUDICIAL OPINIONS

Opinion Type	Legal Status	Purpose
Majority	Binding Precedent	Becomes the "Law of the Land" under Article 141.
Concurring	Supporting Logic	Agrees with the outcome but offers different legal reasoning.
Dissenting	Persuasive Value	Records a disagreement that may shape future legal corrections.

- **Linkages with NCERTs**
- **Class 11 Political Science (Indian Constitution at Work):** Chapter 6 on **Judiciary**. It explains the "Independence of Judiciary" and "Structure of Courts."
- **Class 11 Political Science (Political Theory):** Chapter on **Freedom**, discussing the importance of expressing different views.

- **Way Forward**
- **Protecting the Dissenter:** The appointment process (Collegium) must ensure that judges with independent/dissenting streaks are not overlooked for elevation.
- **Encouraging Scholarly Debate:** Law schools and Bar Associations should analyze dissents as much as majority judgments.
- **Institutional Transparency:** Administrative "master of the roster" powers should be used fairly so that "independent" judges aren't kept away from sensitive constitutional benches.

Understanding geopolitical factors behind India's silence over Khamenei death

NEWS ANALYSIS

Suhasini Haidar
NEW DELHI

The Union government has come under attack from Opposition parties for its silence on the killing of Iran's Supreme Leader Khamenei.

Though External Affairs Minister S. Jaishankar spoke with his Iranian counterpart, Abbas Araghchi, there was no mention in any of the readouts of a condolence message or the condemnation of the U.S.-Israeli strikes in the heart of Tehran.

"The trend towards killing or abducting leaders of sovereign countries needs to be countered if we are to live in a civilised world, and not in the jungle. If countries do not come together to oppose this trend, they themselves may be 'on the menu' next," said one former Ambassador well-versed in international law who asked not to be named.

What then explains the absence of any comment from India over the assassination of Iran's leader, or the deadly strikes on schools and hospitals? The External Affairs Ministry did not respond to requests for a reasoning on its statements.

When asked, experts said there were several factors behind India's decision not to comment directly on the killings in Iran. "First, the challenge of navigating today's complex geopolitics. Second, a circumscribed relationship overall with Iran in recent decades, despite the Chabahar port. And third, Khamenei's criticism of India on the issues of Kashmir and the treatment of minorities," former Ambassador to Iran Rakesh Sood told *The Hindu*.

In the streets: People staging a protest in J&K on Tuesday over the assassination of Iran's Supreme Leader Khamenei. IMRAN NISSAR

Ties with Israel

India has had a close security relationship with Israel for decades, but this has exponentially improved in the past few years. With Mr. Modi's visit to Jerusalem last week, and his address to the Knesset, where he proclaimed India stands "with Israel, firmly, with full conviction, in this moment, and beyond", New Delhi appears to be abandoning its traditional regional balance in favour of Israel. It is significant that after the initial strikes by Israel and Iran's retaliatory strikes across the region, Mr. Modi spoke to Mr. Netanyahu and other Gulf Cooperation Council (GCC) leaders, but not to his Iranian counterpart.

India's ties with Iran have weakened concurrently, not as much due to ties with Israel, but over the tightening of U.S. sanctions on Iran. As a result, after zeroing out oil imports from Iran in 2018, India-Iran trade has wound down from about $17 billion in 2018 to about $1.68 billion in 2025, and investments in Iranian oil and gas fields have been frozen.

India-Iran relations had weathered many political storms in earlier decades. However, more recently, New Delhi had taken umbrage to Khamenei's comments about internal developments in India, including criticism of the Centre's Kashmir policy in 2017 and after the Article 370 amendments in 2019, as well as his statement in March 2020 referring to the Delhi riots as proof of a "massacre of Muslims" in India.

Indians in Gulf region

India's silence may also be explained by its desire to not upset ties in the Gulf region, especially the UAE and Saudi Arabia, where Iran has targeted U.S. bases, oil facilities, and infrastructure. In particular, India's ties with the UAE have been strengthened by a defence partnership announced in January. Government officials told *The Hindu* that it was not possible to take any step that could jeopardise the safety of 10 million Indians who live and work in West Asia.

The Modi government has only just begun to restore ties with the Trump administration after the U.S.'s reduction of tariffs, and agreement on trade announced in February. In addition, the U.S. has included India in its Pax Silica critical technology supply chain. Given the Trump administration's mercurial nature, and threats of sanctions on any engagement with Iran, New Delhi may prefer playing safe.

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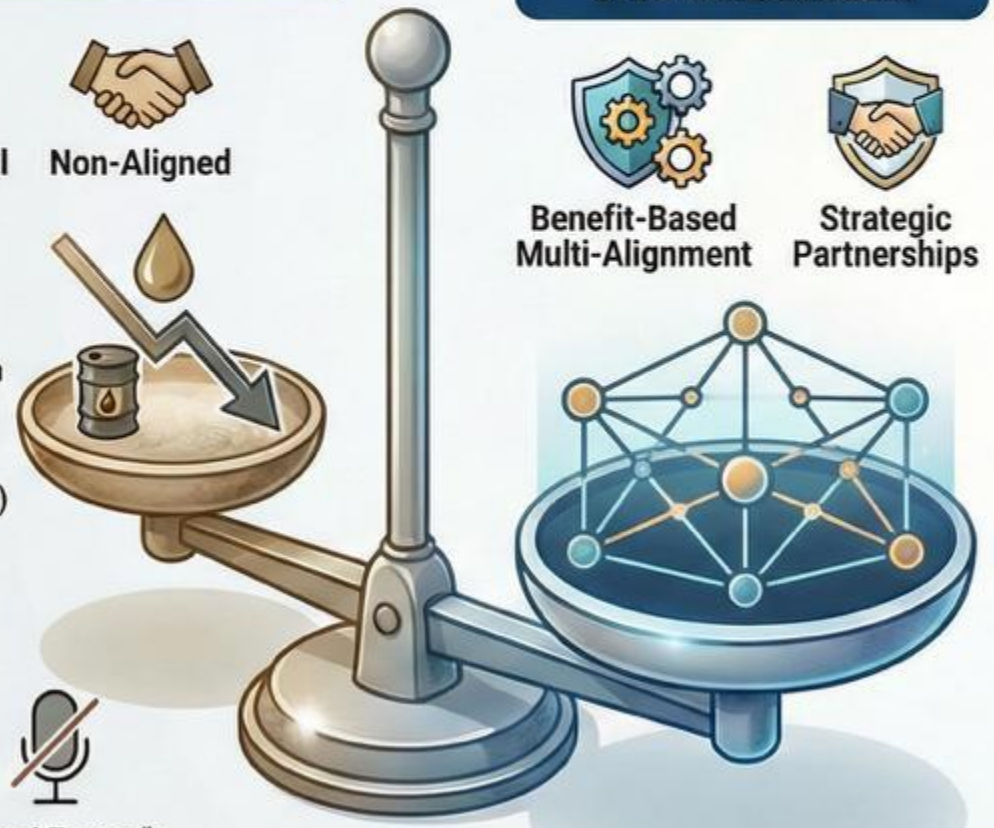
India's West Asia Pivot:
From Balancing to Strategic Realism

PAST: IDEOLOGY & BALANCING

- Anti-Colonial Solidarity
- Non-Aligned

PRESENT: REALPOLITIK & STRATEGIC REALISM

- Benefit-Based Multi-Alignment
- Strategic Partnerships



Trade with Iran plummeted from $17B (2018) to ~$1.68B (2025)

The Great Iranian Decoupling

The "Khamenei Factor": Iran's criticism of Kashmir creates a diplomatic deficit

THE FOUR PILLARS OF STRATEGIC REALISM

DIASPORA-CENTRIC POLICY

Protecting 10 million workers in the Gulf is now a primary national security constraint

I2U2 & PAX SILICA SYNERGY

Deepening defense-tech alignment with the U.S., Israel, and UAE via critical supply chains

RECIPROCAL DIPLOMACY

India no longer feels a moral obligation to support Iran's losses if sovereignty isn't respected

COMPARATIVE POLES: INDIA'S WEST ASIA POLICY

	INDIA-IRAN RELATIONSHIP	INDIA-ISRAEL/GCC RELATIONSHIP
PRIMARY VALUE	Connectivity (Chabahar Port)	Security, Tech & Remittances
ECONOMIC ROLE	Diminishing Energy Supplier	Top Trade & Investment Partners
STRATEGIC LINK	Eurasian Access (INSTC)	I2U2 & IMEC Corridors

Why India needs to radically rethink its doctoral education programmes

India faces many real-world problems that could benefit from high-quality PhD research, these issues span public health, agriculture, sustainability, digital inclusion, and education and the question is whether our current systems support and encourage studies grounded in what the people need

Biju Dharmapalan

The recent announcement that China awarded its first "practical Ph.Ds", doctoral degrees conferred for tangible products rather than traditional research papers, is a timely catalyst for a long-overdue conversation on the relevance, design, and culture of Ph.D. education in India. In China's new model, doctoral candidates are evaluated on working prototypes and real-world applications instead of lengthy theses and publication counts.

This shift recognises applied innovation on par with scholarly writing and challenges the deeply rooted academic paradigm in which a Ph.D. is almost synonymous with a long thesis and a suite of published papers. Our universities should ask themselves whether we need to evaluate a thesis based on the number of papers a scholar has produced or if we need to focus on the societal relevance of the work.

Academic malaise

One major difficulty students interested in research in India face is the prolongation of the Ph.D. In many universities, there are students who have spent more than three years; in some cases, students spend eight. Even though there are many issues with delays in Ph.D. work, most instances are due to delays in publishing. In several departments, progress is judged less by the depth of original insight and more by the number of papers indexed in certain databases and the reputational clout of journals in which they appear. This culture undervalues the quality and relevance of research.

While publication is undeniably a pillar of academic excellence, the current fixation on having multiple indexed papers for a degree to be considered completed can encourage superficial research that may not push disciplinary boundaries or address pressing real-world problems.

It also intensifies the pressure on students to chase journals — any journals — that will accept their work, inadvertently fuelling unethical practices like engaging with predatory journals.

Scholars' plight

In most labs, Ph.D. scholars are treated as labour that supervisors can take for granted. Supervisors exploit the scholars in the name of publication, by prolonging their stay in the lab, so that supervisors don't lose a good student trained in the domain. To maintain their labs, many supervisors also exploit their scholars by offering them the dream of publishing well, which, in reality, is mainly needed for the supervisors' appraisals.

In many universities, Ph.D. theses are measured by the number of pages, often running beyond 200. There is a misconception that the quality of work is directly proportional to this number. FILE PHOTO

This culture is further aggravated by paid publications and dubious journals that promise quick indexing and impact metrics for a fee. Such outlets capitalise on the intense pressure on students to publish, thus creating a shortcut that erodes academic integrity. Though many Indian institutions now require papers to be published in indexed journals, the quality and relevance of these outlets vary widely, and the indexing status itself is frequently commodified by publishers. Ultimately, most doctoral research focuses solely on the university's administrative needs, lacking scientific rigour or societal significance.

Hurdles with theses

In many universities, Ph.D. theses are measured by the number of pages, often running beyond 200. There is a misconception that the quality of work is directly proportional to this number. History shows that even Nobel Prize-winning theses can span only a few pages. When one can concisely explain their research work, expanding it to occupy many pages just because that's the norm is absurd.

The compulsion to write lengthy theses has led scholars to waste time and energy on introductions and inflated literature reviews. Many leading universities across the globe are moving towards compact dissertations that prioritise contributions over volume.

A major structural impediment in India's Ph.D. environment is the conventional thesis-defence model and long-lasting bureaucratic procedures. When they complete their studies, students have to deal with extended timelines to submit their theses, have them evaluated, and finally complete their oral defence. Administrative delays can further extend the final phases of a Ph.D. by months, and in rare instances, even years, irrespective of the candidate's productivity or the study's significance.

An important criticism of India's existing Ph.D. system is that a lot of doctoral research isn't very useful to society as many theses are still preserved in academic archives

For exceptional researchers who have produced significant ideas, potentially creating technologies or therapies with societal relevance, being constrained by prolonged review cycles diminishes the fundamental objective of doctoral studies.

Relevance of doctoral work

An important criticism of India's existing Ph.D. system is that a lot of doctoral research isn't very useful to society. Many theses are still preserved in academic archives and don't often help with public policy, new ideas in business or the health of communities. In many universities, copies of Ph.D. theses are just dumped in a room or a backyard.

A Ph.D. should not be a solitary intellectual pursuit but rather a conduit between profound investigation and significant influence. China's practical Ph.D. model seeks to bridge this gap by matching doctoral outputs with real-world applications and industrial scalability, including welding technology for firefighting systems, and is assessed by panels comprising both academics and industry professionals.

India faces many real-world problems that could benefit from high-quality Ph.D. research. These issues span public health, agriculture, sustainability, digital inclusion, and education. The question is whether our current systems support and encourage studies grounded in what the people need.

Indian universities should brainstorm ways to reform the structure of Ph.D. education to better suit the current world. The age-old practice of spending long years for a Ph.D. doesn't hold any merit in a digital world. Similarly, the structure and evaluation of the thesis should focus on the innovation it describes and its relevance rather than on the number of papers it produced. Just a mushrooming number of Ph.D. holders does no good for the nation; India also needs good quality work that can support nation-building and humankind.

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THE GIST

- In China's new model of 'practical Ph.Ds', doctoral candidates are evaluated on working prototypes and real-world applications instead of lengthy theses and publication counts
- One major difficulty students interested in research in India face is the prolongation of the Ph.D which is mainly due to delays in publishing
- The compulsion to write lengthy theses has led scholars to waste time and energy on introductions and inflated literature reviews
- A major structural impediment in India's Ph.D. environment is the conventional thesis-defence model and long-lasting bureaucratic procedures

- **Key Terms and Explanations**
- **Practical Ph.D.:** A doctoral degree awarded based on the creation of a tangible product, prototype, or solution to a real-world problem, rather than just a written dissertation.
    - *Example:* A scholar designing a low-cost, high-efficiency irrigation sensor for dryland farmers instead of just writing a 300-page paper on soil moisture.
- **Predatory Journals:** Low-quality publications that exploit the "publish or perish" model by charging fees to authors without providing robust peer review or editorial oversight.
- **Bibliometrics (Indexing):** The use of statistical methods to analyze books, articles, and other publications. In India, "Scopus" or "Web of Science" indexing is often used as a rigid benchmark for quality.
- **Applied Research vs. Basic Research:** Basic research seeks to expand fundamental knowledge (e.g., how a cell works), while applied research focuses on solving specific, practical problems (e.g., curing a specific disease).
- **Academic Integrity:** The moral code or ethical policy of academia, including avoidance of plagiarism, data fabrication, and exploitation of subordinates.

- **Main Arguments and Substantive Parts**
- **The "Page-Count" Fallacy:** There is a pervasive administrative myth that a thicker thesis equals better research. This forces scholars to "pad" their work with unnecessary literature reviews, diverting energy from actual innovation.
- **The Publication Trap:** Mandating multiple publications for degree completion has led to a "quantity over quality" crisis. This pressure fuels the rise of predatory journals and unethical shortcuts.
- **Structural Exploitation:** The relationship between supervisors and scholars is often more akin to "master-servant" than "mentor-mentee." Scholars are sometimes kept longer than necessary to maintain the supervisor’s lab productivity.
- **Lack of Societal ROI:** Millions in taxpayer money fund research that ends up in university basements. The disconnect between doctoral research and national challenges (like public health or agriculture) represents a massive "brain waste."
- **The China Model as a Catalyst:** By introducing "practical Ph.Ds," China is aligning its high-level education with its industrial and technological goals. This challenges the traditional definition of "scholarship."

Historical Evolution of the Issue

Pre-Independence: Research was elite and limited, often following the British model of liberal arts and fundamental sciences (e.g., the work of C.V. Raman or S.N. Bose).

Post-Independence (1950s-80s): Expansion of higher education via the UGC Act (1956). The focus was on building institutional capacity (IITs, CSIR labs) to achieve self-reliance.

The 1990s-2000s: Increased globalization led to a "ranking" culture. India began emphasizing international citations and indexed publications to compete globally.

2010s-Present: The proliferation of private universities and the "PhD as a minimum requirement" for teaching led to a massive surge in enrollment but a perceived dip in quality.

NEP 2020: The National Education Policy (2020) recently advocated for multidisciplinary research and the discontinuation of the M.Phil. program to streamline the Ph.D. path.

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Reimagining India's PhD: From "Page-Count" to Practical Impact

Educating UPSC Aspirants on the Structural Shift in India's Doctoral Education

THE TRADITIONAL "QUANTITY" MODEL (THE PROBLEM)

The "Page-Count" Fallacy

Administrative myths prioritize thesis thickness over actual innovation, leading to "padded" work.

The Publication Trap

Mandatory publication requirements fuel low-quality "Predatory Journals" and unethical shortcuts.

Supervisor Tyranny

Power asymmetry often creates "master-servant" dynamics rather than healthy mentorship.

PREDATORY JOURNALS & UNETHICAL SHORTCUTS

THE INNOVATION LOOP

PROBLEM → RESEARCH → PROTOTYPE / SOLUTION → SOCIETAL & INDUSTRIAL IMPACT

THE REFORMED "UTILITY" MODEL (THE SOLUTION)

The "Practical PhD"

Evaluation based on tangible prototypes or patents rather than just written dissertations.

Compact Dissertations

Shifting toward 50-80 page theses focusing etrictly on original contributions.

Industry-Academia Linkage

Mandatory co-supervisors from industry to ensure research has a real-world RDI.

COMPARISON: TRADITIONAL VS. REFORMED MODEL (MAINS QUICK-REFERENCE)

FEATURE	TRADITIONAL MODEL	REFORMED (PRACTICAL) MODEL
Primary Output	300+ Page Text Thesis	Tangible Product / Prototype
Success Metric	Number of Publications	Societal/Industrial Impact
Focus	Basic Research (Theory)	Applied Research (Solutions)

UPSC SYLLABUS LINKAGES

GS Paper 2 & 3
Relevant for Human Resources (GS2) and indigenization of Technology (GS3).

GS Paper 4 (Ethics)
Covers research integrity, predatory publishing, and workplace power dynamics.

- **Linkages with NCERTs**
- **Class 12 Sociology (Social Change and Development in India):** Discusses the impact of education on social mobility.
- **Class 11 Economics (Indian Economic Development):** Chapters on "Human Capital Formation" and "Employment" directly relate to the utility of higher education.
- **Class 12 Political Science:** Themes of "Development" and "Science & Technology policy.“

- **Way Forward**
- **Mandatory Industry-Academia Linkage:** Every Ph.D. student in applied sciences should have a co-supervisor from the industry.
- **Stipend Portability:** Scholars should be able to move their funding if they face harassment or stagnation under a specific supervisor.
- **Outcome-Based Funding:** Universities should receive research grants based on the *impact* of their Ph.Ds (patents, policy changes, startups) rather than just the number of degrees awarded.
- **Digital Tracking:** Use a centralized portal to track Ph.D. progress to ensure students aren't kept beyond 4-5 years without a valid scientific reason.

On India's fighter jet acquisitions

The procurement of the Rafale jets is not just fleet expansion. It is a structural shift in how India positions itself within global defence hierarchies. Securing access to mission software and autonomy to integrate weapons in fighter aircraft is central to advancing India's efforts to indigenise defence development.

Brajendra Mohan

India's Defence Acquisition Council recently cleared the procurement of 114 Rafale fighter jets from Dassault Aviation. The deal is valued at approximately Rs 3.25 lakh crore.

What followed was a recent visit of French President Emmanuel Macron to India for the A.I. Summit where he committed to 'technology transfer' which can significantly elevate the defence capabilities of New Delhi.

Though, this comes with a caveat, reports suggest that France has firmly denied the sharing of the critical source codes which will greatly hamper India's autonomy in customising the software systems and integrating sensors and radar systems.

This will limit New Delhi's attempt in indigenising the operations of the Indian Air Force squadron 'Golden Arrows'. This might also not be the only hiccup India faces in re-positioning itself in the defence hierarchy.

Limited technology transfer

The Indian Air Force operates 29 fighter squadrons against an authorised strength of 42. The MiG-21 fighter jets retired in September 2025 after 62 years. Pakistan maintains around 25 squadrons. China holds around 65. Operation Sindoor in May 2025 exposed this vulnerability through the largest beyond-visual-range engagement in the region's history.

That reality underpins the Rafale procurement: 18 flyaway aircraft, 18 will arrive in fly-away condition. The remaining 96 will be manufactured in India, with indigenous content targeted at 30% initially and 60% eventually.

Tata Advanced Systems has signed agreements with Dassault to manufacture four fuselage sections in Hyderabad, delivering up to 24 fuselages annually from the fiscal year 2029.

The question is whether assembly translates to autonomy. In defence aerospace, ghostwriting leverage is measurable.

It lies in the proportion of domestic value-add, control over mission software, freedom to integrate third-party weapons, and autonomy over lifecycle upgrades all of which now seems to be in jeopardy. Assembly depth without design authority alters production geography but not bargaining power.

France has positioned 'Make in India' as central to the partnership. But technology transfer faces a critical constraint. While Dassault will co-produce the airframe and Safran M88 engines, access to source codes for electronic warfare and radar systems remains restricted. This limits India's ability to independently integrate indigenous weapons.

Software defines modern warfare. Every modification without source code access requires bilateral clearance and entails to foreign contractors.

India's experience with Mirage 2000 upgrades illustrates this, where French vendor dependency added over €1 billion in integration costs across 50 aircraft since 2011. Turkey's TF-X/KAAN programme illustrates the risks of partial transfer. Ankara secured airframe production rights but remains engine-dependent on foreign suppliers.

Russia has reportedly offered unprecedented access to the Su-57 fighter aircraft's source code in consultations for co-production.

The United Aircraft Corporation has signalled willingness to provide greater source code access than Western partners typically offer, potentially enabling deeper avionics customisation. This represents a strategic hedge against Western technological gatekeeping, leveraging existing infrastructure from licensed Su-30MKI production.

However, a hedge is credible only if the supplier possesses the technological and industrial depth to honour it. Russia's aerospace industry operates under sanctions-induced supply constraints, and the Su-57's engine programme remains in transition from 42-4SFS to Izdeliye 30.

Whether "full source code access" extends to mission system architecture or only limited avionics layers remains unclear. A hedge that substitutes one dependency for another does not deepen autonomy.

India is nearing a deal to export Su-30MKI fighters to Armenia, valued at $3 billion. The Armenian variant will feature the indigenous Uttam AESA radar and Astra missiles. This marks India's shift from licensee to modifier-exporter, signalling a new level of absorption maturity.

Diversification as leverage

India's diversification across France, Russia, Israel, and the United States prevents supplier monopoly and strengthens negotiating leverage.

Operation Sindoor validated India's pumbler-airpower doctrine but exposed coordination complexities across Rafale, Su-30MKI, and Mirage 2000 platforms. The episode reinforced the primacy of software integration.

This has accelerated emphasis on integrated Air Command and Control Systems and Theatre Commands.

Union Budget 2026-27 allocated a record ₹7.85 lakh crore to the Ministry of Defence, an increase of over 15%. Capital outlay surged by over 20% to ₹2.19 lakh crore. Approximately 75% of the capital budget, ₹1.70 lakh crore, is earmarked for domestic procurement under the Boosting Indigenous Defence Manufacturing category.

This fiscal expansion is industrial policy by design. The mandate forces global original equipment manufacturers to establish not just assembly lines but Tier 1 and Tier 2 supplier networks within India. Defence production reached Rs 1.9 lakh crore in the fiscal year 2024-25. The private sector's share rose to 23%.

Yet context matters. China's defence spending is estimated at approximately $245 billion. India's $83 billion budget necessitates an asymmetric strategy and qualitative superiority rather than numerical parity.

The resurgence of Donald Trump adds transactional volatility. Delays in engine deliveries underscore how American industrial bottlenecks directly impact Indian sovereign capabilities. Diversification of technology partners across France, Israel, and Russia is, thus, a geoeconomic necessity.

The path to strategic autonomy

The Indian Air Force achieved a Tri-Dal Rating of 69.4 in the World Directory of Modern Military Aircraft 2026 rankings, placing it sixth globally. This surpasses China's rating of 65.6. This ranking reflects combat power and operational readiness. It does not measure industrial power or technological sovereignty.

As MP80 notes, India is the world's fifth largest military spender at $86.1 billion in 2024 and remains a top arms importer, pursuing import reduction policies.

The decisive metric is absorption capacity. Defence research and development received $39,000 crore in fiscal year 2026-27. Without doubling research intensity, co-development claims remain partial.

Tier 2 and Tier 3 suppliers face capital constraints. In advanced aerospace ecosystems such as the United States and France, domestic value capture in fighter aircraft programmes exceeds 60%.

In India, indigenous value-add in major licensed production platforms has historically ranged between 25-35%, concentrated in structural manufacturing rather than mission systems. Without deepening subsystem ownership, domestic content targets risk remaining assembly heavy.

Indian Air Force's (IAF) Rafale aircrafts perform a flypast during the 77th Republic Day Parade, at New Delhi. (PTI)

THE GIST

- India's Defence Acquisition Council recently cleared the procurement of 114 Rafale fighter jets from Dassault Aviation. The deal is valued at approximately Rs 3.25 lakh crore.
- France has positioned 'Make in India' as central to the partnership. But technology transfer faces a critical constraint since access to source codes for electronic warfare and radar systems remains restricted.
- In India, indigenous value-add in major licensed production platforms has historically ranged between 25-35%, concentrated in structural manufacturing rather than mission systems. Without deepening subsystem ownership, domestic content targets risk remaining assembly heavy.

Brajendra Mohan is professor and dean, O.P. Jindal Global University. He is a visiting professor at LSE and a visiting academic fellow at University of Oxford. Subham Raj and Nagappan Arun contributed to this column.

- **Key Terms and Explanations**
- **Source Code:** The fundamental "blueprint" or programming instructions of an aircraft’s software. Without it, India cannot integrate its own indigenous missiles (like the Astra) onto the Rafale without French permission and assistance.
- **Mission Software:** The "brain" of the jet that controls sensors, radars, and electronic warfare suites.
- **BVR (Beyond Visual Range):** Air-to-air combat where the target is not visible to the naked eye, relying entirely on radar and long-range missiles.
- **AESA Radar (Active Electronically Scanned Array):** A sophisticated radar system that allows jets to track multiple targets simultaneously with high precision and low probability of intercept.
- **Atmanirbhar Bharat:** The policy of "Self-Reliant India," aiming to reduce import dependency, particularly in strategic sectors like defense.
- **Tier 2 and Tier 3 Suppliers:** Smaller companies that provide specialized components (bolts, sensors, specialized alloys) to the main manufacturer (Tier 1).

- **Main Arguments and Substantive Parts**
- The core thesis is that **Strategic Autonomy is now defined by software, not hardware.**
- **The Procurement Paradox:** While India is buying 114 Rafales to fix its dwindling squadron strength (currently 29 against a requirement of 42), the refusal of France to share source codes keeps India "tethered" to French OEMs (Original Equipment Manufacturers).
- **The Russian Hedge:** Russia’s offer of the Su-57 with higher source code access acts as a strategic counter-weight to Western "gatekeeping," though Russian industrial reliability is currently hampered by global sanctions.
- **The "Assembly vs. Authority" Gap:** Manufacturing 96 jets in India via Tata-Dassault is a win for "Make in India," but without "Design Authority," India remains an assembler rather than a creator.
- **Economic Industrial Policy:** The record ₹7.85 lakh crore defense budget for 2026-27 is an attempt to use state spending to force global giants to build local supply chains.

Historical Evolution of the Issue

The License Era (1960s-1990s): India relied on licensed production of Soviet MiG-21s. While this built manufacturing skills, it didn't lead to design capability.

The Mirage 2000 Experience (2011-Present): India realized the high cost of dependency when upgrading these French jets cost over €1 billion due to lack of software control.

The MMRCA Saga (2007-2015): The original quest for 126 Medium Multi-Role Combat Aircraft (MMRCA) ended in a direct purchase of 36 Rafales, highlighting the urgency of the IAF’s needs over long-term industrial goals.

The Indigenous Shift (2020s): The success of Tejas (LCA) and the export of modified Su-30MKIs to Armenia marks the start of India as a "modifier-exporter."

Sovereignty in the Skies: India's Shift from Aircraft Assembler to Design Authority

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The Sovereignty Gap: Why "Make in India" is Not Enough

The Squadron Deficit

29 Fighter Squadrons

42 Sanctioned Requirement

The Source Code Paradox

Without source code access, India cannot integrate indigenous weapons (like Astra) without foreign permission.

The "Assembly vs. Authority" Gap

Make in India Assembly

Manufacturing 96 jets locally creates jobs but leaves India as an assembler.

The Roadmap to Technological Sovereignty

Licensed Production (1960s)
Dependent on foreign blueprints

Assembly/Make in India (Current)
Local manufacturing, limited design control

Design Authority (Future Goal)
Owning the source code and mission software. True strategic autonomy.

Strategic Multi-Alignment

Using Russia (Su-57) as a hedge to pressure Western partners for better tech-transfer.

From Licensee to Modifier-Exporter

Integrating Indian radars on Su-30MKIs for export to Armenia proves technological absorption.

Defense Push: Economic & Technical Scale

- Defense Budget (2028-27): ₹7.85 Lakh Crore
- Capital Procurement Target: 75% Domestic Earmarking
- Indigenization Milestone: Defense Production crossed ₹1.5 Lakh Crore

The "Laboratory vs. Runway" Metric

Autonomy requires doubling R&D to 2% of GDP and mastering indigenous jet engines.

- **Linkages with NCERTs**
- **Class 12 Political Science (Contemporary World Politics):** Chapter on "Security in the Contemporary World"—explains traditional notions of security and balance of power.
- **Class 10 Geography:** Chapter on "Manufacturing Industries"—contextualizes the importance of the aerospace industry in the national economy.
- **Class 12 Physics:** Understanding Radar (Electromagnetic waves) and Semiconductors—the technical basis of modern warfare.

Way Forward

1.R&D Doubling: India must move from 0.7% of GDP on R&D to at least 2% to build indigenous design authority.

2.Mission System Sovereignty: Prioritize the development of "Open Architecture" systems so that future jets can integrate any weapon without OEM permission.

3.Human Capital Pipeline: Establish "Defense Universities" focused specifically on aerospace metallurgy, jet propulsion, and AI-driven electronic warfare.

4.Specialized Venture Capital: Create a government-backed fund specifically for aerospace MSMEs to bridge the "long-cycle" capital gap.

livemint

Serum's covid and influenza combo vaccine trial gets nod

Major firms like Pfizer are currently developing the combination vaccine as market grows

Priyanka Sharma
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NEW DELHI

India's apex drug regulator has approved the third phase of clinical trials for the country's first combined covid-19 and influenza vaccine from Serum Institute of India (SII), according to two government officials and documents reviewed by *Mint*.

A panel of the Central Drugs Standard Control Organisation (CDSCO) has recommended that SII proceed with advanced Phase III clinical trials for its vaccine—Trivalent Nanoparticle Influenza (tNIV) Vaccine and Covid Trivalent Influenza Combination (CIC) Vaccine—that targets both covid and influenza in a single dose.

"By combining protection against the seasonal flu and covid-19 into one shot, health authorities aim to simplify immunization schedules and significantly reduce 'vaccine fatigue' among the general population," said the first government official requesting anonymity.

This decision was taken at a high-level meeting held on 22 January at the CDSCO headquarters in New Delhi, where the Subject Expert Committee (SEC) also approved the domestic rollout of SII's standalone covid vaccine, targeted at the Omicron JN.1 variant.

Clinical trials are conducted in three primary phases before final approval.

The decision was taken at a high-level meeting held on 22 January at the CDSCO headquarters in New Delhi. REUTERS

Major pharma companies like Moderna, Pfizer, and BioNTech are currently developing covid and influenza combination vaccines, with many entering advanced stages of clinical trials.

Queries emailed to the spokesperson of the Drugs Controller General of India (DCGI) and the Union health and family welfare ministry on 25 February, and the Serum Institute of India on 19 February, remained unanswered.

$2.45 bn
Estimated value of the Indian vaccine market in 2024

The total Indian vaccine market was estimated at $2.45 billion in 2024 by consulting firm Grand View Research. Within this, the specific India covid vaccine segment was valued at $765.18 million in 2024, while the Indian influenza vaccine market is valued at $261.70 million in 2024, global management consulting and market research firm TechSci Research said.

Globally, the scale is larger, with the influenza vaccine market projected to reach $0.98 billion by 2026, according to Fortune Business Insights. AI-driven 360iResearch estimates the global covid vaccine market at $283.3 billion for 2026.

$765 mn
The value of the India covid vaccine segment in 2024

The covid vaccine segment, valued within a broader $2.45 billion national vaccine market, according to Grand View Research. Also, the influenza vaccine market is expanding rapidly, valued at $261.76 million in 2024 with a growth rate of 7.45%.

India has approved a diverse portfolio of covid vaccines under different regulatory categories. Three primary vaccines—Covishield (by Serum Institute), Covaxin (Bharat Biotech), and Corbevax (Biological E)—are approved for manufacture, sale, and distribution following initial emergency use authorization.

Twelve other vaccines have received authorization for restricted use in emergency situations for the primary vaccination. These include Sputnik-V, Moderna, and Janssen, and domestic options like the DNA-based ZyCoV-D and the nasal vaccine iNCOVACC.

Covid is endemic in India with minimal active viral circulation.

According to the National Centre for Disease Control, India typically experiences two influenza outbreak peaks—from January to March, and the post-monsoon season.

Dr. Soumya Swaminathan, former WHO chief scientist, said, "Covid-19 remains a significant factor in seasonal respiratory illness spikes. Boosters targeting current variants like JN.1 are preferred over older versions. While separate shots are common, moving toward combination shots (covid-19-influenza) for vulnerable groups could be an effective future strategy."

For an extended version of the story, visit livemint.com

- **Key Terms and Explanations**
- **CDSCO (Central Drugs Standard Control Organisation):** India’s national regulatory body for cosmetics, pharmaceuticals, and medical devices. Think of it as the "watchdog" ensuring any medicine you take is safe and effective.
- **Subject Expert Committee (SEC):** A group of specialized doctors and scientists who advise the CDSCO. They review clinical trial data before a vaccine moves to the next stage.
- **Phase III Clinical Trials:** The final, large-scale testing phase involving thousands of volunteers. It’s designed to prove that the vaccine actually works in the real world and to catch rare side effects.
- **Trivalent/Multivalent Vaccine:** A vaccine that targets multiple strains of a virus at once. For example, a trivalent flu shot protects against three different flu strains.
- **Vaccine Fatigue:** A psychological state where people become hesitant or indifferent toward getting vaccinated, often due to the perceived "hassle" of repeated doses or too many different shots.
- **Endemic:** A disease that is always present in a certain population or region (like the common cold or malaria in certain areas), rather than causing a sudden, massive outbreak (pandemic).

Main Arguments and Substantive Parts

The core thesis of this development is that **integrated immunization** is the future of respiratory disease management.

Simplification of Health Logistics: By combining Covid-19 and Influenza shots, the government can utilize a single supply chain (cold storage) and a single appointment to protect against four or more viral strains.

Combating Inertia: Public interest in Covid boosters has waned. A combination shot "piggybacks" Covid protection onto the more established annual flu shot routine, ensuring vulnerable groups stay protected.

Targeting Variants: The approval of the JN.1 variant-specific vaccine shows a shift toward "precision immunology"—matching the vaccine to the specific mutation currently circulating.

Economic Opportunity: With the Indian vaccine market valued at over $2.4 billion, domestic production of high-tech combination shots reduces import dependency and positions India as a global "pharmacy of the world."

Historical Evolution of the Issue

Pre-Independence: India primarily dealt with smallpox and plague through reactive measures. The Haffkine Institute (1899) marked the beginning of domestic vaccine research.

1978 – Expanded Programme on Immunization (EPI): Focused on basic childhood diseases (TB, DPT, Polio).

1985 – Universal Immunization Programme (UIP): A major shift toward structured, nationwide vaccine delivery.

2020-2022 – Pandemic Era: Rapid development of Covishield and Covaxin. This period established the regulatory "fast-track" mechanism and the **CoWIN** digital infrastructure.

Present Day: Transition from "Emergency Use Authorization" (EUA) back to standard clinical trial pathways, focusing on **combination vaccines** and **variant-specific** boosters.

Integrated Immunization: India's Milestone COVID-19 & Influenza Combination Vaccine

AXIA IAS ACADEMY

THE STRATEGIC RATIONALE: WHY COMBINE?

Combating Vaccine Fatigue

Reduces the psychological "hassle" of repeated shots by providing dual protection in one visit.

Transition to Endemic Management

Shifts COVID-19 management from emergency response to a routine, seasonal respiratory health strategy.

Logistical & Economic Efficiency

Minimizes medical waste and streamlines cold-chain storage by using a single supply chain.

2-in-1

COVID-19 ANTIGEN

COVID-19 ANTIGEN

INFLUENZA ANTIGEN

SINGLE SHOT - DUAL PROTECTION

UPSC RELEVANCE

- GS Paper 2 (Health Governance)
- GS Paper 3 (S&T/Biotech)

INDIA'S VACCINE LANDSCAPE

SCALE & FRAMEWORK

MARKET VALUE: Approx. **$2.45 Billion** (2024)

PLATFORM TECH: Shifting to Nanoparticle & Variant-specific (JN.1) tech.

LEGAL FRAMEWORK: New Drugs and Clinical Trial Rules (2019) & Article 47.

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THE SCIENTIFIC & REGULATORY FRAMEWORK

Nanoparticle Technology (tNIV)

Uses engineered tiny particles to mimic virus structures, triggering a more robust immune response.

CDSCO & SEC Oversight

India's "watchdog" (CDSCO) and expert panels ensure safety through rigorous Phase III clinical trials.

Multidimensional Impact

Boosts "Vaccine Diplomacy" globally while ensuring social equity for vulnerable domestic populations.

- **Linkages with NCERTs**
- **Class 12 Biology (Chapter: Human Health and Disease):** Explains how vaccines work, the concept of antigens, and the immune system.
- **Class 10 Science (Chapter: Why do we fall ill?):** Basic principles of immunization and infectious diseases.
- **Class 12 Political Science:** Global health governance and the role of international agencies like the WHO.

- **Way Forward**
- **Strengthening Pharmacovigilance:** Create a robust mobile-app-based system for citizens to report any post-vaccination symptoms.
- **Public Awareness:** A transparent communication campaign to explain *why* the combination shot is safe.
- **Incentivizing R&D:** The government should provide "viability gap funding" for companies working on neglected diseases or advanced combination shots.
- **Universalizing Flu Shots:** Currently, flu shots are not part of the UIP for adults. Integrating this could revolutionize adult healthcare in India.