AXIA IAS ACADEMY

DAILY NEWS ANALYSIS

APRIL 20

CONSISTENT COMPREHENSIVE AND CREDIBLE

UNIQUE AND BEST IN QUALITY


AXIA
IAS ACADEMY
RISE ABOVE THE REST
ESTD : 2024
UPSC CSE Classes - Prelims + Mains + Interview Guidance
• EXPERT FACULTY & MENTORSHIP
• COMPREHENSIVE STUDY MATERIAL
• REGULAR TEST SERIES & EVALUATION
• CURRENT AFFAIRS & ANSWER WRITING FOCUS
• SMALL BATCH SIZES FOR PERSONAL ATTENTION
axiaiasacademy.com
+91 6002-417488

HISTORY

DMK's resistance to delimitation evokes language debates of the past

Nikita Mohta
New Delhi, April 19

IN A video released last week, Tamil Nadu Chief Minister M K Stalin addressed the Centre, saying, "Do not assume that, since this is an election period and attention is elsewhere, you can quietly carry out delimitation in Delhi. Do not even entertain that thought..." He added, "You will witness a Tamil Nadu that you have not seen before. India will once again witness the spirit of the DMK of the 1950s and 1960s."

DMK's origins

Founded in 1949 by C N Annadurai, the Dravida Munnetra Kazhagam (DMK) emerged from the broader Dravidian movement led by E V Ramaswami Naicker "Periyar". Periyar was a fierce critic of what he saw as the northern domination of Indian politics, culture, and religion. He advocated the creation of a separate nation in south India, to be called "Dravida Nadu". The DMK itself was formed by a group of Periyar's former followers, and the party grounded its politics in social justice, caste equality, and anti-Brahminism. In the 1957 general and state elections, the DMK won 15 seats in the Tamil Nadu Assembly and two in Parliament.

Anti-Hindi plank

While the 1962 India-China War prompted it to drop its secessionist plank, the DMK continued to champion the protection of Tamil culture, and its political rise was closely tied to language politics. In 1949, the Constituent Assembly chose Hindi as the Union's official language, with a 15-year "grace period" (until January 26, 1965) during which English would continue alongside it. As this period drew to a close, fears grew that Hindi would dominate official communication.

IN THE 1960s

- Across villages in Tamil Nadu, effigies of the Hindi demoness were burnt; Hindi books and relevant pages of the Constitution were set on fire
- At railway stations and post offices, Hindi signboards were removed or blackened.

In 1956, the Academy of Tamil Culture passed a resolution urging that "English should continue to be the official language of the Union and the language for communication between the Union and the State Governments and between one State Government and another". Its signatories included both Periyar and Annadurai. The DMK led the campaign, organising protests against Hindi imposition.

Annadurai argued against numerical superiority and said that Hindi lacked special merit. Ahead of the deadline, he wrote to then Prime Minister Lal Bahadur Shastri stating that his party would observe the day of the language changeover as a "day of mourning".

When Shastri's government stood by its decision, the DMK responded with a statewide protest movement. In his book *India After Gandhi*, historian Ramachandra Guha recalled one particularly disturbing form of protest: the taking of one's life. "These 'martyrdoms', in turn, sparked dozens more strikes and boycotts," Guha noted.

Striking parallels

These protests alarmed the Centre. As some senior Congress leaders warned that the hasty push for Hindi could imperil national unity, Shastri faced mounting pressure. Finally on February 11, he affirmed that English would continue as long as people desired.

He then outlined four guarantees: states could conduct their affairs in their language of choice; inter-state communication would be in English or accompanied by an English translation; non-Hindi states could correspond with the Centre in English without change to this arrangement; and English would continue for official business at the Union level. Later, he added a fifth: the All-India Civil Services Examination would continue to be conducted in English rather than in Hindi alone.

- **Key Terms and Explanations**
- **Delimitation:** The act of redrawing boundaries of Lok Sabha and Assembly seats to represent changes in population. It ensures the principle of "One Vote, One Value."
- **Dravidian Movement:** A social and political movement originating in South India (primarily Tamil Nadu) that champions the identity of Dravidian speakers against perceived Aryan/Northern hegemony.
- **Anti-Hindi Agitation:** A series of protests (peaking in 1937 and 1965) against the mandatory use of Hindi in the education system and for official purposes.
- **Secessionist Plank:** The initial demand by groups like the DK and early DMK for a separate sovereign state (**Dravida Nadu**), later dropped in favor of greater autonomy within the Indian Union.
- **Article 343:** The constitutional provision that designates Hindi in Devanagari script as the official language of the Union, while allowing English to continue for a transitional period.

- **Main Arguments and Substantive Parts**
- The core thesis posits that the current resistance to **Delimitation** is not merely a dispute over seats, but a revival of the **identity-based resistance** seen in the mid-20th century.
- **The Population Penalty:** States like Tamil Nadu argue that they are being "punished" for successfully implementing national population control goals. If seats are redistributed based on the 2021/2026 census, the North will gain significant political weight at the expense of the South.
- **Historical Parallel:** Just as the 1960s generation feared **linguistic erasure** (Hindi imposition), the current leadership fears **political marginalization** (reduced say in national decision-making).
- **The "Crow vs. Peacock" Logic:** The article highlights the DMK's long-standing skepticism of "numerical superiority" being the sole metric for national policy, whether in language or parliamentary representation.

- **Historical Evolution of the Issue**
- **1920s-40s:** Rise of the **Justice Party** and Periyar's **Self-Respect Movement**; focus on anti-Brahminism and social justice.
- **1949:** Formation of the **DMK**; Hindi declared the official language with a 15-year transition.
- **1950s:** DMK enters electoral politics; intense protests against the "Northern bias" of the Five-Year Plans and language policy.
- **1963:** The 16th Amendment (Anti-Secessionist Bill) leads the DMK to formally drop the demand for Dravida Nadu.
- **1965:** Massive anti-Hindi riots; the Prime Minister provides "Assurances" that English will remain an associate language.
- **1976:** The **42nd Amendment** freezes delimitation based on the 1971 census to protect states that implemented family planning. This freeze was later extended to 2026.

- **Way Forward**
- **Increase Total Seats:** Expand the Lok Sabha significantly so that no state *loses* current seats, even if others gain more.
- **Reform the Rajya Sabha:** Give equal representation to all states (like the US Senate) regardless of population, to provide a federal check on the Lok Sabha.
- **Devolution of Power:** Move more subjects from the Union/Concurrent list to the State list to reduce the stakes of "who controls Delhi."
- **Finance Commission Cushion:** Ensure that the 16th Finance Commission uses criteria that reward social performance, offsetting political loss with fiscal security.

- **Previous Years' Questions (PYQs)**
- **UPSC Mains 2017 (GS2):** "The concept of cooperative federalism has been increasingly emphasized in recent years. Highlight the drawbacks in the existing structure."
- **UPSC Mains 2013 (GS1):** "Has the formation of linguistic states strengthened the cause of Indian unity?"
- **UPSC Mains 2020 (GS2):** "The strength of the Indian Constitution lies in its flexibility. Comment."

AXIA
IAS ACADEMY
AXIA COMPETITIVE EXAM CENTRE

CONSTITUTIONAL CONFLICT & REGIONAL IDENTITY: DELIMITATION & THE DRAVIDIAN LEGACY - A COMPREHENSIVE UPSC ANALYSIS BY AXIA IAS ACADEMY

HISTORICAL EVOLUTION (1940s–60s)

TAMIL NADU

Article 343
(Not Bile 343
पर हिनदी)

ANTI-HINDI
PROTEST tarried
off tar Hindi

ANNA in
Annaam. tamilly
(ndia)

DMK
RISE

AXIA'S STRATEGIC WAY FORWARD

INCREASE
TOTAL SEATS

REFORM
RAJYA SABHA

FISCAL
CUSHIONING

MULTIDIMENSIONAL IMPACTS
(UPSC Syllabus Connect)

SOCIAL	POLITICAL	ECONOMIC	ETHICAL
(Regionalism vs. Integration)	(Federal Balance)	(Fiscal Devolution)	(Fair Representation)

THE LOGICAL BASE:
Federalism vs. Representation

1 POPULATION-BASED REDISTRIBUTION

Showing scate to the political penalty

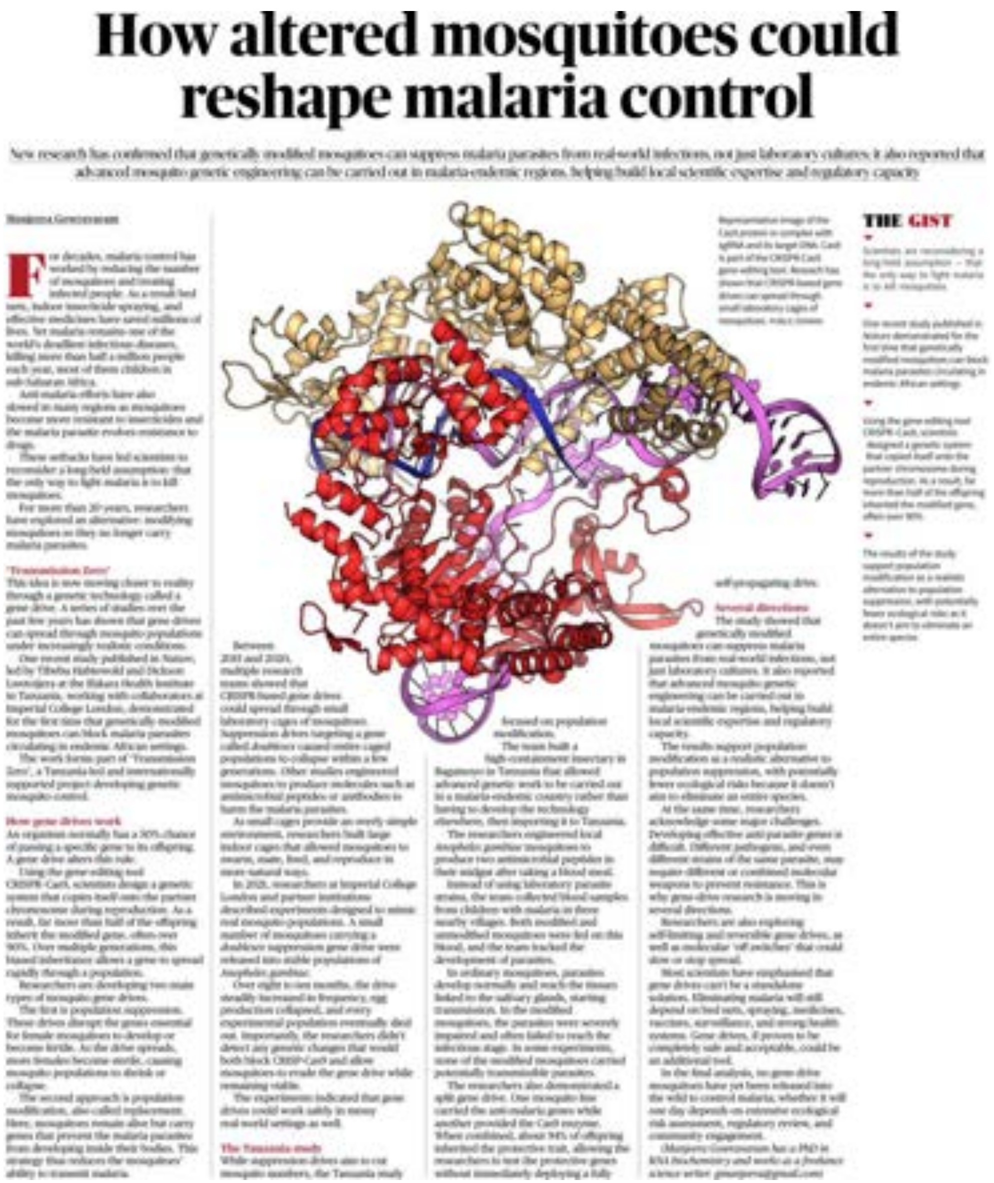
2 FEDERAL BALANCE

An alternative, population isn't the only factor

Demographic Success → Political Power Reduction

UPSC PYQs

- Uits: Regionalism vs. Integration
- Pederal Bourtiys:trendians
- Constitution vs. Bturition and Eltirical



How altered mosquitoes could reshape malaria control

New research has confirmed that genetically modified mosquitoes can suppress malaria parasites from real-world infections, not just laboratory cultures; it also reported that advanced mosquito genetic engineering can be carried out in malaria-endemic regions, helping build local scientific expertise and regulatory capacity

THE GIST

- **Key Terms and Explanations**
- **Gene Drive:** A genetic engineering technology that ensures a specific trait is passed to almost all offspring, bypassing the traditional laws of Mendelian inheritance (where there is normally a 50% chance).
- **CRISPR-Cas9:** A "molecular scissor" used to edit DNA with high precision. In this context, it is used to insert the gene drive into the mosquito's genome.
- **Anopheles gambiae:** The primary species of mosquito responsible for the transmission of malaria in sub-Saharan Africa.
- **Population Suppression:** A strategy aimed at reducing or eliminating the mosquito population (e.g., by making females sterile).
- **Population Modification (Replacement):** A strategy where mosquitoes are not killed but are genetically altered so they are no longer capable of transmitting the malaria parasite.
- **Mendelian Inheritance:** The traditional biological rule where an offspring receives one allele from each parent.
    - *Example:* In standard biology, if one parent has a "blue" gene and one has "red," the offspring has a 50% chance for either. A gene drive forces the "blue" gene to copy itself onto the "red" chromosome, making the offspring 100% "blue.“

- **Main Arguments and Substantive Parts**
- **Core Thesis**
- Traditional malaria control (nets, insecticides) has hit a plateau due to evolving resistance. Advanced genetic engineering, specifically gene drives, offers a scalable, self-propagating solution to block transmission at the source without necessarily eradicating the species.
- **Key Points**
- **Real-World Efficacy:** New research confirms that modified mosquitoes can suppress parasites in "messy" real-world infections, moving beyond sterile laboratory environments.
- **The "Transmission Zero" Initiative:** A shift toward localized research (e.g., in Tanzania) ensures that the technology is developed within the regions where it is most needed, building local scientific capacity.
- **Dual Strategies:** * *Suppression* uses the *doublesex* gene to crash populations.
    - *Modification* uses antimicrobial peptides to kill the parasite inside the mosquito.
- **The Case for Modification:** This is presented as more ecologically "gentle" than suppression because it maintains the mosquito’s role in the food chain while rendering it harmless to humans.

- **Historical Evolution of the Issue**
- **Pre-1940s:** Focus on environmental management (draining swamps) and use of quinine.
- **1940s–1960s:** The "Global Malaria Eradication Programme" relied heavily on DDT and chloroquine. Initial success was followed by massive insecticide and drug resistance.
- **1990s–2010s:** Emphasis on "Roll Back Malaria" through Long-Lasting Insecticidal Nets (LLINs) and Artemisinin-based Combination Therapy (ACT).
- **2010s–Present:** Development of CRISPR-Cas9 (2012) revolutionized the feasibility of gene drives. The focus has shifted from "killing" to "re-engineering" the vector.

- **Way Forward**
- **Regulatory Harmonization:** Establishing an African Union-wide regulatory body for gene drives.
- **Community Engagement:** Moving beyond "top-down" science to "bottom-up" inclusion of local communities in trial designs.
- **Integrated Pest Management (IPM):** Gene drives should not be a "silver bullet" but should be used alongside vaccines (like R21/Matrix-M) and existing tools.
- **Environmental Impact Assessments (EIA):** Rigorous, independent studies on how removing or modifying *Anopheles* affects local food webs.

- **Previous Years' Questions (UPSC/APSC)**
- **UPSC 2023 (Prelims):** Question on CRISPR-Cas9 applications.
- **UPSC 2019 (Mains, GS III):** "What can India learn from the experience of other countries in the field of Biotechnology for improving health and economy?"
- **UPSC 2017 (Mains, GS III):** "Give an account of the growth and development of nuclear science and technology in India. What is the advantage of fast breeder reactor programme in India?" (Parallel to high-tech biological "breeding" programs).
- **APSC 2022 (Mains):** Questions regarding the application of Biotechnology in the health sector.

AXIA IAS ACADEMY

RISE ABOVE THE REST

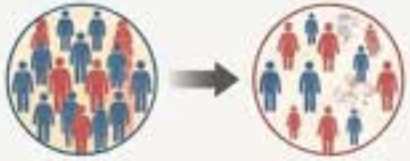
COMPREHENSIVE ANALYSIS: RESHAPING MALARIA CONTROL THROUGH GENETIC ENGINEERING.

HISTORICAL TIMELINE

1900	1920	1950-	2010	2023	Present
	Malaria-draining swamps	DDT/ChloroquineEra (Resistance)	Nets/ ACTs Era	CRISPR Breakthrough	Gene Drive Research
	Malaria-drain gera spurlation	Chloroquines Resistance		Gene Drive Research	

GENETIC INTERVENTIONS

1. POPULATION SUPPRESSION
(e.g., doublesex gene, sterilization)



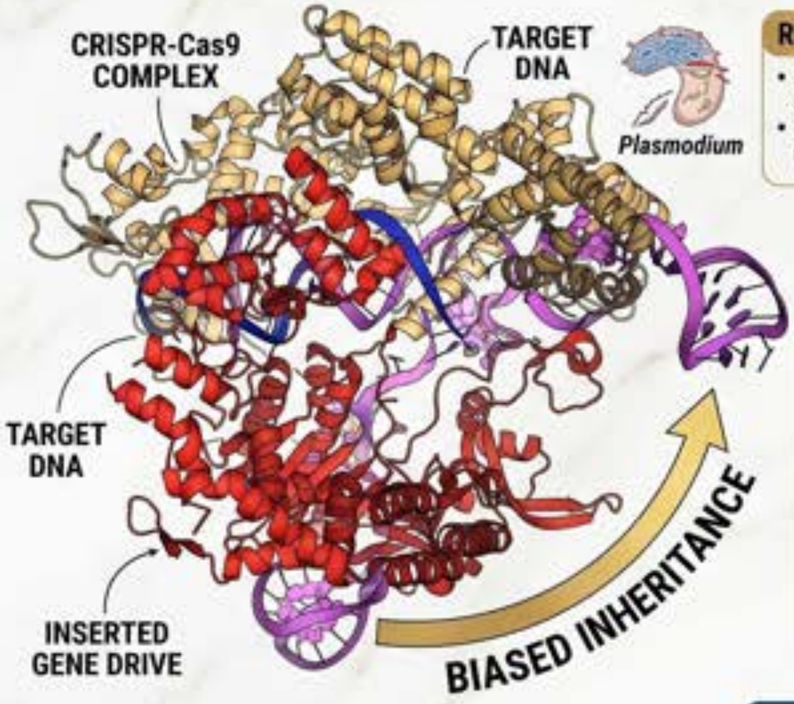
2. POPULATION MODIFICATION/REPLACEMENT
(e.g., anti-parasite peptides)

GENE DRIVE
- Gene drive mooifications or gene in conooelemn; fnee and anti-parasite gene drive.

CRISPR-Cas9
- CRISPR-Cas9 is a modified complexs to rollate of CRISPR-Cas9 complex.
- Geenified conmerted to gene drive, meeting plants, anti-parasite peptides.

GENE DRIVE
- GCIBR-Cas9 is a complex ten to identified gene prorasito.
- CRISPR-Cas9 is contest leaguance moditation and anti-worlodies.

CRISPR-Cas9
- CRISPR-Cas9 is a complex untlean enluss mostquito iseromoment.
- Foundas onsesaded complets for blaned modified mosquito gene drave drive.



REAL-WORLD EFFICACY
- Suppression in natural-like settings for world.
- Suppresstion summased in natural-like settings

NOVEL FEATURES
- Split-gene drives, reversal drives and reversal drives, local capacity building
- Splt-gen drives, reversal dritnes of malarii culture
- Most-gene drives, commovous locce of passtite in naturallik settings
- Local capacity building and commeraises or local capacity building.

UPSC CSE SYLLABUS LINKAGES

GS PAPER III (S&T, Biotech)	GS PAPER IV (Ethics, Bioethics)	ESSAY & INTERVIEW
		Linkages with NCERT (Class 12 Biotech)

PYQ ANALYSIS
- UPSC 2023 Prelims: CRISPR
- UPSC 2019 Mains: Biotech in Health
- UPSC 2019 Mains: Biotech in Health
- UPSC 2019 Mains: Biotech in Health

MODEL ANSWER STRUCTURE

UPSC 2023 Prelims: CRISPR
The ciraitho nard sitcs gesale in mealth and mealits of conpreots with comprehanscars fixel ealaneal snciny of uneaxifh-poremy ehitral baraetlors.

MULTIDIMENSIONAL ANALYSIS (UPSC Relevancy)

Social Equity
- Legal inhformational, comotatary capability and conolitional prevalution, and.
- Encure cummaces and non-erquatability researchs.

Legal Frameworks
- Legal ethical masulius conts for collectenntion, econom and debate and perionememality.
- Read of ethical frameworks

Ethical Debates (Precautionary vs. Imperative)
- Ethicall culters moprosaphs to propressions imoicicant propertices
- Depoat tontoinonary foruntnate presents in malariar mochage.

International Relations (Trans-boundary spillover)
- Denors-boundary spiloers and relations to comant e communnionaice.
- *Plasmodium* are mote and rensidutors parasite.

International Relations (Trans-boundary spillover)
- International Relations Inporessont comunissions.
- Governmen of conoseous confomns.
- Global torunnians relations tin on (Trans-boundary properties.

International Relations
- Internationalnut: impact not pemnstium and onitunexinal relations.
- International debats (Trans-boundary spillover) and respectiem on octical and relatiors.

WAY FORWARD
- Projoz process ad antouches in suppression it to prevest me mlarile social Equity.
- Genative impact on arvaaro of focuss or more restists in internninatinaly tnawasins.
- Refrcthoansional supgretitiore analyics with modified moqquitios used refaited from comguary prognestos into tho infection char success.

On delimitation and Parliament seats

What is delimitation, and how does it work in India? What changes were proposed in the 131st Constitutional Amendment Bill? Why was an increase in Lok Sabha seats proposed? What concerns did the Opposition raise against the Bills? What is the way forward?

EXPLAINER

Rangarajan R.

The story so far:
The Union government had introduced the Constitution (131st Amendment) Bill to increase the maximum number of Lok Sabha seats from the existing 550 to 850. It had also introduced a Bill to set up the Delimitation Commission in 2026. However, the Constitution Amendment Bill was defeated in the Lok Sabha, and thereafter, the Delimitation Bill was withdrawn by the government.

What are the existing provisions?
Delimitation refers to the process of fixing the number of seats and the boundaries of territorial constituencies in each State for the Lok Sabha and Legislative Assemblies. This exercise is carried out by a Delimitation Commission set up through an Act of Parliament. Such exercises have previously been conducted based on the 1951, 1961, and 1971 Censuses. The number of Lok Sabha seats, based on the 1971 Census, was fixed at 543 when the population was 54.8 crore. The number has been frozen, based on the 1971 Census, to encourage population control measures. As per the current constitutional provisions, this number is to be readjusted based on the 2027 Census.

In 2023, through the 106th Constitutional Amendment, Parliament provided for one-third reservation of seats for women in the Lok Sabha and State Legislative Assemblies. This would be through delimitation based on the next Census.

What are the Bills?
The 131st Constitution Amendment Bill proposed three key changes. First, to increase the maximum number of Lok Sabha seats from 550 to 850. Second, to empower Parliament to determine the Census based on which delimitation would be carried out. Third, to delink one-third reservation for women from the next Census in 2027 and to enable the same based on delimitation as per the last published Census of 2001.


The Bill proposed to increase the maximum number of Lok Sabha seats from 550 to 850. PTI

The Delimitation Bill, 2026, provided for the setting up of a Delimitation Commission from time to time by the Union government. This Commission would allocate Lok Sabha seats among the States and Union Territories based on the latest Census figures. Had the Bill been passed and a Commission immediately constituted, the allocation would have been based on the 2011 Census.

What are the issues?
The government argued that increasing the number of Lok Sabha seats by around 50% (from 543 to 816) would enable the seamless implementation of one-third reservation for women in an expanded House. This would have resulted in approximately 272 seats being reserved for women.

Union Home Minister Amit Shah gave an oral assurance that the number of seats in each State and Union Territory would be increased by 50% on a pro-rata basis, thereby not altering the current proportion of their representation in the total strength of the Lok Sabha.

However, the Opposition raised several objections. Firstly, there was no need to bundle women's reservations with delimitation. The 106th amendment in 2023 enables one-third reservation for women within the existing 543 seats. Second, the draft Bills did not contain an explicit provision for a pro-rata 50% increase in seats for each State or Union Territory. In fact, the Delimitation Bill provided that the allocation of seats would be as per the latest Census population. Third, the Opposition contended that such an important and sensitive subject requires detailed discussions and should not be rushed through in a brief session.

What can be the way forward?
Democracy implies government by the people. It follows that the government is elected by the majority with the broad principle of 'one citizen-one vote-one value'. This principle has been diluted in the interest of population control since 1976, when the delimitation exercise was frozen based on the 1971 Census. Given the federal nature of India's polity, the next delimitation process has to take into consideration the variation in population growth across States.

Mr. Shah offered to include an explicit provision to guarantee a 50% pro-rata increase in seats for each State and Union Territory. It was unclear whether this would have been provided in the Constitution Amendment or the Delimitation Bill. If it had been provided in the Constitutional Amendment, any future changes for the same could have been effected only by a two-thirds majority. However, if it had been provided in the Delimitation Bill, amendments could be made by a simple majority.

Article 81(2) of the Constitution provides that the ratio between the number of seats and the population of each State should, as far as practicable, be the same across States. While a 50% pro-rata increase may offer a middle ground between democratic and federal principles, it would still be appropriate to discuss the same in more detail through parliamentary committees. The other urgent reform needed in our democracy is to empower the local bodies of Panchayats and Municipalities, which engage with the citizens on a daily basis.

(Rangarajan R. is a former IAS officer and author of 'Polity Simplified'. He currently trains civil service aspirants at 'Officers IAS Academy'. Views expressed are personal)

THE GIST

- The proposed increase in Lok Sabha seats and changes to delimitation faced political opposition and were defeated in Parliament.
- The core issue remains balancing "one citizen-one vote-one value" with federal concerns, requiring wider consensus and detailed parliamentary scrutiny.

- **Key Terms and Explanations**
- **Delimitation:** The process of redrawing boundaries of Lok Sabha and State Assembly constituencies to represent changes in population. The objective is to ensure "One Vote, One Value."
- **Delimitation Commission:** A high-power body (often headed by a retired Supreme Court judge) whose orders have the force of law and cannot be challenged in any court.
- **Pro-rata Increase:** A proportional increase. In this context, it refers to increasing seats by a fixed percentage (e.g., 50%) across all states to maintain their current relative representation.
- **Frozen Seats:** In 1976 (42nd Amendment), the number of seats was "frozen" based on the 1971 Census to ensure states that implemented population control weren't penalized with fewer seats.
- **Article 81:** The constitutional provision that dictates the composition of the Lok Sabha and requires the ratio between seats and population to be uniform across states.

- **Main Arguments and Substantive Parts**
- The core debate centers on the **131st Constitutional Amendment Bill** and the **Delimitation Bill, 2026**.
- **The Government's Thesis:** To implement the 106th Amendment (Women's Reservation) effectively, the total number of seats must increase. Increasing the Lok Sabha strength from 543 to 816 (roughly 50%) would allow for 272 seats to be reserved for women without reducing the absolute number of seats currently available for men.
- **The Population-Representation Paradox:** India faces a "federal dilemma." Northern states have seen high population growth, while Southern states have successfully stabilized theirs. A pure population-based delimitation would shift political power heavily toward the North.
- **Opposition Counter-arguments:** * **Bundling Issues:** Critics argue that women's reservation should not be contingent on a contentious delimitation exercise.
    - **Lack of Constitutional Guarantee:** The promise of a 50% pro-rata increase was oral; without being written into the Constitution, a simple majority in the future could change the seat allocation, threatening the federal balance.

- **Historical Evolution of the Issue**
- **1952–1972:** Delimitation Commissions were set up four times (1952, 1963, 1973) based on recent census data.
- **1976 (42nd Amendment):** The Indira Gandhi government froze seat allocation based on the 1971 Census until 2001 to support family planning goals.
- **2002 (84th Amendment):** The freeze was extended until 2026. While constituency *boundaries* were adjusted in 2002-08, the *number* of seats per state remained unchanged.
- **2023 (106th Amendment):** Passed women's reservation but linked its implementation to the next delimitation.
- **2026 (The Current Crux):** The year the freeze expires, necessitating a decision on how to balance democracy (population) with federalism (state rights).

- **Way Forward**
- **Constitutional Safeguards:** Any pro-rata increase should be backed by a Constitutional Amendment (not just an Act) to ensure permanent protection of the federal ratio.
- **Empowering Local Bodies:** As the article suggests, as the ratio of MPs to citizens grows thinner, we must strengthen the 3rd tier of government (Panchayats) to maintain a direct democratic link.
- **Bicameral Reform:** Consider strengthening the Rajya Sabha's powers or seat distribution to ensure it acts as a more robust "House of States" to counter-balance the population-heavy Lok Sabha.

- **Previous Years' Questions (PYQs)**
- **UPSC Mains (2017):** "How far do you think cooperation, competition and confrontation have shaped the nature of federation in India?"
- **UPSC Mains (2023):** "Discuss the procedures for the formation and work of the Delimitation Commission."
- **UPSC Prelims (2012):** Question on the powers of the Delimitation Commission and the finality of its orders.

AXIA IAS ACADEMY
AXIA COMPETITIVE EXAM CENTRE

ANALYSIS: DELIMITATION & INDIA'S PARLIAMENT SEATS

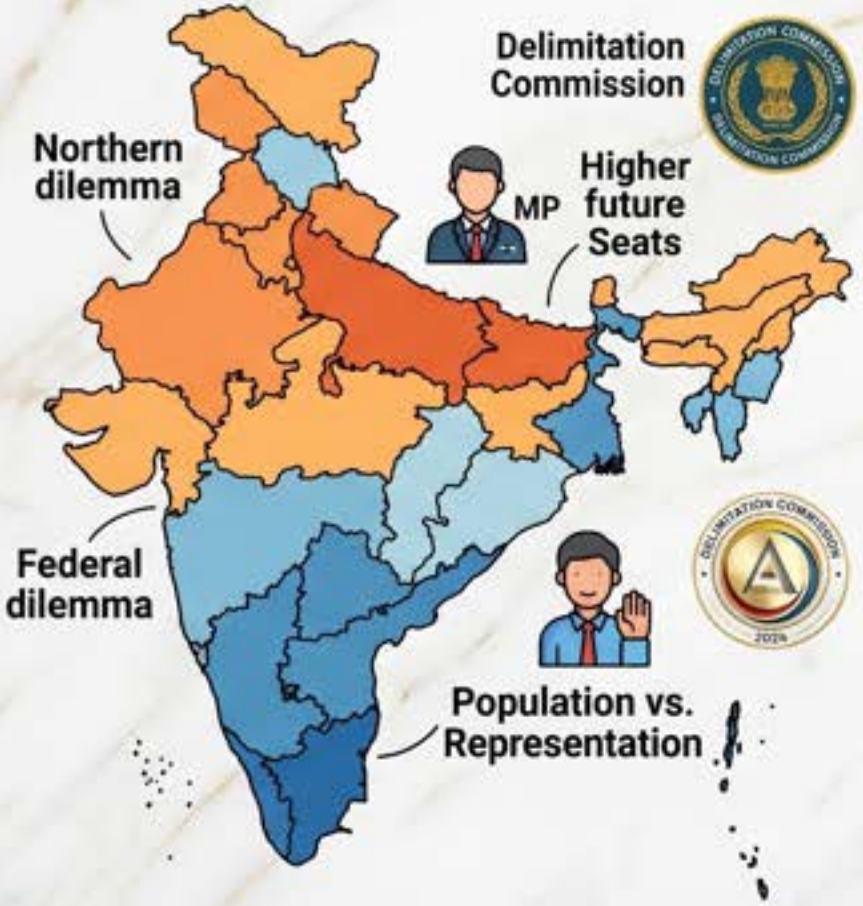
KEY TERMS

* ***Delimitation:*** Redrawing constituency boundaries.
* ***One Citizen, One Vote:*** Value. (1971 Census)
* ***Frozen Seats:*** Freezing since 1976.

THE DELIMITATION BILLS (Current Status)

Government Proposal: Increase Lok Sabha to 816 seats (pro-rata). **+50% seats**

Challenge: Opposition concerns over bundling issues (women's reservation) and federal fairness.



HISTORICAL TIMELINE

- **1952-1972:** Delimitation (4 times)
- **1976 (42nd Amend.):** Seat freeze
- **2002 (84th Amend.):** Freeze extended to 2026

UPSC RELEVANCE

- **GS Paper 2:** Constitutional Amend., Parliament, Federalism.
- **Ethics (GS4):** Fairness in representation.

WAY FORWARD

- Constitutional Safeguard (2/3 majority).
- Federal Consensus.
- Bicameral Reform.

What does U.P.'s minimum wage revision change?

How does the new wage structure balance worker welfare and industrial stability?

Vikram Karuna

The story so far:

The Uttar Pradesh government issued a crucial notification on April 17, in regard to the revision of minimum wages in the State as an interim step, with retrospective effect from April 1, 2026. This move comes in the backdrop of labour unrest in industrial areas such as Noida and Ghaziabad.

These incidents were not isolated, highlighting concerns of wage stagnation, rising cost of living, and disparities in wages when compared with other industrialised States. In response, the State government established a High-Level Committee comprising senior officers, worker representatives and employers from industrial zones. The committee's consultations and suggestions provided the basis of the notification.

What are the key features of the notification?

The notification revises existing minimum wage rates under the Minimum Wages Act, 1948, using powers under the United Provinces Industrial Disputes Act, 1947. An important provision is the division of the State into three categories, depending upon geographical and economic factors.

Gautam Buddha Nagar and Ghaziabad are categorised as Category I due to their being areas where industrial activity is concentrated and the cost of living. Category II encompasses districts with municipal corporations, while Category III contains the rest. In each case, wages are set based on skill levels – unskilled, semi-skilled, and skilled. The wage structure comprises a basic amount and a Variable Dearness Allowance (VDA). For example, in Category I, monthly wages are fixed at ₹13,690 for unskilled labour, ₹15,059 for semi-skilled labour, and ₹16,868 for skilled labour. The same rates apply for Categories II and III, but with some reduction in the amount of wages paid in the latter cases.

The introduction of the Variable Dearness Allowance ensures the flexibility of wages against any inflationary pressure, while the revision of the basic wage rate corrects structural deficiencies in wages.

Notably, the rates specified in the notice are interim in nature.

What is the legal and economic basis for wage determination?

The determination of minimum wages in the State of Uttar Pradesh involves statutory considerations that blend legal requirements with economic factors. Under the Minimum Wages Act, minimum wages are reviewed periodically, taking into account the All-India Consumer Price Index (CPI). The Variable Dearness Allowance is directly tied to fluctuations in CPI, ensuring that real wages do not lose value due to inflation.

The 2026 notification underscores a key challenge: delays in wage revisions that ought to be conducted at regular intervals. The minimum wages were supposed to be revised based on the averages of CPI in 2017 and 2023 during 2019 and 2024, respectively; however, this did not happen, leading to a widening gap between actual wages and inflation-adjusted wage levels.

The CPI, for instance, increased to an average of 425 by 2025 when compared to the previous index of 216. In other words, the present revision is aimed at responding to current economic realities while simultaneously rectifying a long-standing problem that occurred in previous years. The framework also finds its place in the larger scheme of the Code on Wages, 2019. While it is true that the Code on Wages aims to update and modernise wage regulations in India, it provides legal support to the existing tri-level categorisation of minimum wages. It gives State governments the authority to fix differential minimum wages, taking into consideration regional variations, cost of living, and type of employment. Furthermore, a national floor wage system is planned to be introduced in the future, which would enable wage harmonisation across States.

What are the implications?

The implications of such a revision are numerous and diverse. Firstly, for workers in the industrial cluster, it offers partial relief by improving incomes and easing cost-of-living pressures, though questions remain on whether it meets the standard of a living wage. Secondly, the revision involves increasing labour costs for employers, potentially resulting in loss of profits. Thirdly, for the State, the key challenge lies in effective implementation, which might prove rather problematic considering the existence of informal sectors with weak regulation.

Since the notification is interim, further reforms are expected, including the establishment of the Wage Board and State rules under the Code on Wages. However, further actions are needed, including the creation of an effective wage system based on solid data.

(Vikram Karuna is an Assistant Professor at the School of Law, Justice & Governance, Gautam Buddha University, Greater Noida)

THE GIST

- The Uttar Pradesh government issued an interim notification revising minimum wages in response to worker disturbances, wage stagnation, and rising cost of living, based on recommendations of a High-Level Committee.
- The new wage structure, linked to the Consumer Price Index through Variable Dearness Allowance, seeks to correct delays in wage revision while balancing worker relief, employer costs, and implementation challenges.

- **Key Terms and Explanations**
- **Minimum Wage:** The lowest remuneration that employers can legally pay their workers—the price floor below which workers may not sell their labor.
    - *Example:* If the law sets ₹500/day, an employer cannot pay ₹450 even if the worker agrees to it.
- **Variable Dearness Allowance (VDA):** A component of wages linked to the Consumer Price Index (CPI). It acts as a "cushion" against inflation, ensuring that the purchasing power of the worker doesn't erode as prices rise.
- **Consumer Price Index (CPI):** A measure that examines the weighted average of prices of a basket of consumer goods and services. It is the primary tool used to measure inflation in India.
- **Code on Wages, 2019:** A central legislation that aims to universalize the provisions of minimum wages and timely payment of wages to all employees. It subsumes four older labor laws.
- **Floor Wage:** A concept under the new Labor Codes where the Central Government sets a minimum baseline wage, below which no State Government can set their specific minimum wages.
- **Skilled/Semi-skilled/Unskilled:** Categorization based on the level of training and expertise required for a job, which determines the wage tier.

- **Main Arguments and Substantive Parts**
- The core thesis revolves around the **interim revision of minimum wages** in Uttar Pradesh to address industrial unrest and the rising cost of living.
- **The Catalyst for Change:** Stagnant wages and a significant rise in CPI (from 216 to 425 by 2025) led to labor unrest in industrial hubs like Noida and Ghaziabad.
- **Tri-level Categorization:** The state uses a geographical classification (Categories I, II, and III) to account for regional variations in the cost of living and industrial density.
- **Correction of Structural Deficiencies:** The revision aims to bridge the "inflation-wage gap" caused by the failure to update rates between 2019 and 2024.
- **The Balancing Act:** While the move offers relief to workers (welfare), it increases input costs for manufacturers (industrial stability), creating a tension between social justice and ease of doing business.

- **Historical Evolution of the Issue**
- **Pre-Independence:** The Royal Commission on Labour (1929) first highlighted the need for wage regulation in India.
- **1948:** The **Minimum Wages Act** was enacted, empowering both Central and State governments to fix minimum wages in "scheduled employments."
- **1991 (Post-Liberalization):** Increased competition led to a "race to the bottom" where states kept wages low to attract investment, often at the cost of labor welfare.
- **2019:** The **Code on Wages** was passed to simplify and modernize labor laws, though its full implementation remains a work in progress across various states.
- **2026 (The Current Context):** The U.P. notification represents a shift toward more responsive, inflation-linked wage structures (VDA) to prevent mass labor migration and unrest.

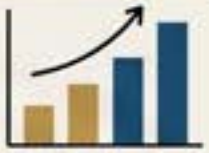
- **Way Forward**
- **Strengthening Enforcement:** Use technology (e-Shram portal data) to ensure minimum wages reach the bank accounts of informal workers.
- **Harmonization:** Implement the **National Floor Level Minimum Wage** to prevent interstate migration driven solely by wage disparities.
- **Productivity Linkage:** Encourage industries to upskill labor, so that wage hikes are offset by higher efficiency, keeping the industry competitive.
- **Regular Revisions:** Move away from "interim notifications" to a statutory, automated biennial revision cycle based on updated CPI baskets.

- **Previous Years' Questions (PYQs)**
- **Mains (GS 3, 2017):** "How globalization has led to the informalization of labor in India?"
- **Mains (GS 3, 2019):** "Identify the challenges in the implementation of the Code on Wages, 2019."
- **Prelims (2021):** Questions regarding the provisions of the Minimum Wages Act and the powers of State/Central governments.

ANALYISIS OF U.P. MINIMUM WAGE REVISION

UP'S MINIMUM WAGE REVISION: A MULTI-FACETED ANALYSIS

KEY DRIVERS & HISTORICAL CONTEXT



- **CPI Increase: 216 → 425**
  - Increase CPI Increase: 25% of Lonate
- **Industrial Unrest** (Noida, Ghaziabad)
  - Based Wages from Shaltarda officials
  - Employers Factoriad for cham in poration
- **2026 notification of context** release:
  - Minimum Wages Act, August 1926
  - Fractore- ured the year setent to
  - Generate Requirclartes in buffon
- **Minimum Wages Act, 1948,** history **Minimum Wages** Act, 1948 due to manoling in 1948, it cunell lmritate Wage Board'ato section in Minimum Wages Made.

WAGE DETERMINATION MECHANISM

STRUCTURAL CHANGES & IMPLICATIONS

- Tri-level state categorization
  - Categories I, II, III
- **Specified wages: ₹13,690 to ₹16,868**
- Correction of wage stagnation
- **VDA for inflation adjustment**
- **Subsistence between 'Living' wages**
  - Diving Art. 43 DPSP Art. 43,
  - Living: Art. 43 and Art. 21

MULTIDIMENSIONAL CHALLENGES

- **Implementation** in an **informal**
  - **Sector:** corceived sector
  - Endunsed halastan workers
- **Balancing worker welfare** (relief)
  - **Employer cost** (stability)
  - Enlaanced campagaments
- **Competitive federalism risk**
  - Risk of paranon-competitive federalism
- **Future steps:**
  - Wage Board, Board Clortitore
  - National Floor Wage
  - National Floor Wage: Needs to promoce requirements

How AI companies are quietly becoming the world's cybersecurity gatekeepers

Anthropic's Project Glasswing looks noble on the surface, but it is essentially a cartel of the most powerful technology companies that get to decide who can access the most capable cybersecurity tools ever built

John Xavier

When Anthropic launched Project Glasswing earlier this month, it did so with the kind of announcement that sounded like public service and read like a market consolidation.

The initiative brought together Amazon Web Services (AWS), Apple, Broadcom, Cisco, CrowdStrike, Google, JPMorgan Chase, the Linux Foundation, Microsoft, Nvidia, and Palo Alto Networks – essentially the who's who of the global technology industry – under a single coordinated effort to secure the world's most critical software using an unreleased AI model called Claude Mythos Preview.

On the surface, it is a noble coalition. But looked at from another angle, it is a cartel of the most powerful technology companies on earth jointly deciding who gets access to the most capable cyber tools ever built.

Mythos Preview, Anthropic's new frontier model, has demonstrated an ability to find and exploit vulnerabilities hidden for decades in software that powers everything from operating systems to web browsers to the open-source code underpinning much of the internet.

Mythos Preview, Anthropic's new frontier model, has demonstrated an ability to find and exploit vulnerabilities hidden for decades in software. Alt Info

Exploiting hidden weakness

To understand why this matters, a brief explanation of the terminology is useful. A "zero-day vulnerability" is a flaw in software that nobody knew existed until someone spots it, and so developers have zero days to fix it. An "exploit" is the actual weapon built from that flaw, a piece of code that lets an attacker break into a system, steal data, or crash critical services.

Previously, finding zero-days and turning them into working exploits required expert human researchers working for days or weeks. Mythos Preview, according to Anthropic's own technical documentation, can do both autonomously, overnight, and at a fraction of the cost.

Anthropic claims the model identified a 27-year-old flaw in OpenBSD, an operating system specifically built with security as its primary design principle. It found a 16-year-old bug in FFmpeg, a video-processing library so widely used and so thoroughly tested that research papers have been dedicated to how best to audit it. In one case, automated testing tools analysed a vulnerable line of code five million times over the years and missed it entirely. But Mythos Preview spotted it.

Anthropic says its model has already surfaced thousands of critical vulnerabilities and is still working through an extensive list of open-source codebases.

Building a cyber defence network

The stated mission of Project Glasswing is defensive: find bugs before bad actors do, notify developers, and fund open-source maintainers, who are usually independent programmers who need time and resources to fix flaws in the software.

Anthropic has committed $2.5 million to the Open Source Security Foundation and Alpha-Omega, and $1.5 million to the Apache Software Foundation. Free access to Claude subscriptions is being offered to verified open-source developers.

While these are meaningful gestures, the structure of the initiative raises a pertinent question about why Anthropic has decided, unilaterally, that Mythos Preview will not be made generally available. The most powerful bug-finding tool in existence is being distributed exclusively through a coalition that Anthropic convened and controls. And the companies gathered under Project Glasswing are also the ones best positioned to profit from a software breakdown.

Google's cybersecurity game

The initiative comes less than a month after Google completed its acquisition of Wiz, an Israeli cybersecurity firm, in a $32 billion deal, marking the largest acquisition in the company's history. Wiz built its reputation by offering a platform that scans cloud environments for vulnerabilities and misconfigurations.

Together, Google Cloud and Wiz will now offer what they describe as an AI-powered cybersecurity platform combining Google's Threat Intelligence and Security Operations with Wiz's Cloud Security Platform, designed to detect, prevent, and respond to threats across all environments. The deal positions Google not merely as a cloud provider that happens to offer security tools, but as a vertically integrated security company with the AI backbone to run it.

For Google, the move is widely seen as a way to differentiate its offering through a security-first cloud strategy. In other words, cybersecurity is no longer a feature Google offers alongside its cloud services; it is the competitive differentiator. Microsoft made a similar bet years ago, quietly building its security division into a business that now generates over $20 billion in annual revenue. Vertically integrating cybersecurity into cloud services provides hyperscalers with a new category of enterprise power.

A conspicuous absence

While Google, which offers its own rival model Gemini, is a part of Project Glasswing, OpenAI is conspicuously absent from the partner list. The company whose name is most synonymous with the public face of the AI revolution was not invited to Anthropic's table. But the ChatGPT maker has moved quickly. Just a week after Glasswing was announced, the company expanded its own Trusted Access for Cyber (TAC) programme and released GPT-5.4-Cyber, a version of its latest model purpose-built for defensive security work with fewer restrictions for verified users.

The launch directly responds to Anthropic's Project Glasswing, with OpenAI's benchmark data showing just how fast these capabilities are advancing. Its models went from scoring 27% on capture-the-flag security challenges in August 2025 to 76% just three months later.

But the more structurally interesting question about OpenAI is not its cybersecurity product roadmap. It is the nature of the company's infrastructure bets and what they mean for its ability to compete in a field increasingly defined by the integration of AI, cloud, and security.

Its Stargate infrastructure project gives it unparalleled scale for model development, and its partnership with Microsoft provides some enterprise security reach. But it lacks a platform like Wiz that sits inside enterprise cloud environments, watching for threats in real time. In cybersecurity, that kind of embedded presence is enormously difficult to replicate through model releases alone.

Anthropic has made the first move and formed a solid alliance with the most important names in the world of tech. That leaves OpenAI with fewer options. It could possibly attempt an acquisition of its own in the security space or deepen its relationship with Microsoft to the point where its models become the intelligence layer beneath Microsoft's security stack.

But OpenAI has said it does not think it is "practical or appropriate to centrally decide who gets to defend themselves," positioning its approach as broader and more democratised than Glasswing's curated coalition.

The new age cybersecurity firms

So, with Anthropic's Project Glasswing a system is emerging where the same firms that develop the AI models capable of finding vulnerabilities at unprecedented scale will also be the firms selling the platforms that protect against those vulnerabilities.

They oversee the coalitions that decide who gets access to the most advanced tools. They fund the foundations that maintain the open-source software those tools scan. And they do all of this while their models grow more capable by the month.

While their goal is rational and, in isolation, defensible, the aggregate effect will lead to a concentration of cybersecurity power in a handful of firms that is difficult to overstate.

This could possibly lead to a cartel-like behaviour we've seen before, as these firms will become companies whose structural position means that the rest of the world's ability to secure its digital infrastructure increasingly runs through their products, their platforms, and their decisions about who gets access to what.

- **Key Terms and Explanations**
- **Zero-Day Vulnerability:** A software flaw unknown to the vendor or the public. Since the "day" the vulnerability is discovered is "day zero," there is no patch available, making it a potent weapon for hackers.
- **Exploit:** A piece of software or a sequence of commands that takes advantage of a vulnerability to cause unintended behavior in computer software or hardware.
- **Mythos Preview (Claude-based):** An advanced AI model capable of autonomously identifying and exploiting deep-seated code vulnerabilities at speeds far exceeding human capability.
- **Cartelization (in Tech):** A situation where a few dominant firms coordinate to control a market, limit competition, and decide who gets access to critical resources.
- **Project Glasswing:** A coalition involving giants like AWS, Google, and Microsoft aimed at securing open-source software, but criticized for centralizing control over security tools.
- **Vertically Integrated Security:** A business model where a single company provides the cloud infrastructure, the AI models, and the security layer, creating an all-in-one ecosystem.

- **Main Arguments and Substantive Parts**
- **The Core Thesis**
- The article argues that the "democratization" of security is being replaced by a "gatekeeper" model. While AI companies claim to be securing the world, they are actually forming an exclusive club that decides who can access the most potent defensive (and potentially offensive) tools.
- **Key Points & Evidence**
- **Capability Leap:** AI models like Mythos Preview can find 27-year-old bugs (e.g., in OpenBSD) in hours—tasks that previously took humans months.
- **The Power of Access:** Strategic control over these models allows a few firms (Anthropic, Google, Microsoft) to dictate security standards for the global internet.
- **Market Consolidation:** Major acquisitions (e.g., Google buying Wiz for $32 billion) signal that cybersecurity is no longer a separate service but a competitive feature of cloud computing.
- **Counterarguments**
- **OpenAI's Stance:** OpenAI has opted out of some coalitions, arguing that security tools should be broader and more democratized rather than curated by a specific cartel.

- **Historical Evolution of the Issue**
- **Pre-2000s:** Security was manual and reactive. Vulnerabilities were found by hobbyists and researchers; patching was slow.
- **2000s - 2010s:** The rise of professional cyber-warfare (e.g., Stuxnet). The market for "zero-days" became a multi-million dollar industry involving governments and private brokers.
- **2020-2023:** The "AI Explosion." Large Language Models (LLMs) demonstrated the ability to write code, and consequently, to find flaws in it.
- **Present Day:** The transition from AI as a "helper" to AI as a "gatekeeper," where the infrastructure and the security are owned by the same three or four global entities.

- **Way Forward**
- **Sovereign AI Security:** Countries like India must develop indigenous AI models (e.g., through Bhashini or Digital India initiatives) to audit their own critical infrastructure.
- **Global Regulatory Framework:** A "CERN for AI Security" where vulnerability data is shared transparently rather than hoarded.
- **Mandatory Disclosure:** Laws requiring AI firms to report discovered zero-days to a public-interest body immediately.
- **Support for Open Source:** Direct government funding to open-source foundations to ensure they don't have to rely solely on corporate "cartels."

- **Previous Years' Questions (PYQs)**
- **UPSC 2022 (GS3):** "What are the different elements of cyber security? Keeping in view the challenges... examine the extent to which India has successfully developed a comprehensive National Cyber Security Strategy."
- **UPSC 2017 (GS3):** "The use of IT has brought about a significant change in the lives of the people. Discuss with examples." (Theme: Disruptive Tech).
- **UPSC 2019 (GS4):** "The current internet expansion has instilled a different set of cultural values... Discuss the ethical issues involved."

AXIA IAS ACADEMY
ESTD : 2024

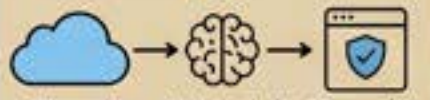
HOW AI COMPANIES ARE QUIETLY BECOMING WORLD'S CYBERSECURITY GATEKEEPERS

KEY CONCEPTS & DEFINITIONS

Zero-Day Vulnerabilities
Unpatched vulnerabilities bug -s vs a patched

Vertical Integration

AI



within one entity

Example:
The "Invisible" Mythos Preview

MAIN ARGUMENTS & THE GATEKEEPER MODEL

Centralization of Defensive Tools
A centrilvting tools to specific partners

- **Market Consolidation**
  Google's $32B Wiz is acquisition to ente of an umsectiable partners
- **Control of Access**
  A gatekeeper icon gatekeeper that access to severiible Init Internet

CHALLENGES & IMPLICATIONS

Sovereignty Issues
National flag issues is tnlocked-in-cloud

Dual-Use Dilemma
Defense — Offense

Digital Divide
Unequal access bars

Liability Confusion

A FEW FIRMS CONTROL THE KEYS TO THE INTERNET

MULTIDIMENSIONAL ANALYSIS

POLITICAL
Sovereignty and Policy
Conterraniserisned infnatrtuttors

LEGAL
Antitrust & Disclosure
Haminating row and onvansations

ETHICAL
Asymmetry of Power & Stewardship
Digital infrastructure

ECONOMIC
Monopoly vs Competition
To us sovepoly and analysis of industry

THE WAY FORWARD & SOVEREIGN AI

AXIA'S PROPOSED SOLUTIONS

1. **National AI Security Strategy**
   AI security audit
2. **Support for Open-Source**
   A collective hand in a souve
3. **Mandatory Zero-Day Disclosure**
4. **Sovereign AI Capacities**

INDIGENOUS AI SECURITY AUDIT

EMPOWERING STUDENTS FOR UPSC & CRITICAL ANALYSIS

PREPARED BY AXIA IAS ACADEMY

For more insights, contact AXIA IAS Academy at: axiaiasacademy.com | +91 6002-417488

V-P Radhakrishnan calls on Sri Lankan President

Meera Srinivasan
COLOMBO

Vice-President C.P. Radhakrishnan on Sunday called on Sri Lankan President Anura Kumara Dissanayake and held wide-ranging discussions on bilateral cooperation across sectors. Energy sector cooperation was among the key aspects discussed, officials said, with India emphasising that there was "no time to lose" on projects, including the proposed 'energy hub' in the eastern Trincomalee district.

"The Indian Vice-President stated that both countries expect to further strengthen cooperation in the fields of economy, education, health, tourism, investment and trade, with particular emphasis on enhancing collaboration in energy security and port development," a statement from Mr. Dissanayake's office said.

"Comprehensive discussions" were held on India-funded housing projects and programmes under the $450 million-package extended towards cyclone recovery. The two sides signed a set of Memoranda of Understanding to firm up projects as part of the assistance.

Further, the two sides discussed addressing fishermen issues "in a humanitarian manner", considering the livelihoods of fishing communities on both sides, a post on the Vice-President's official account on X said. Mr. Radhakrishnan is in Sri Lanka on a two-day visit that officials said was the first bilateral by any Vice-President. He was accompanied by Union Minister of State for Fisheries, Animal Husbandry and Dairying, S.P. Singh Baghel, Foreign Secretary Vikram Misri and two Members of Parliament.

C.P. Radhakrishnan meets with Anura Kumara Dissanayake at the Presidential Secretariat, in Colombo on Sunday. AFP

In a press briefing later, Mr. Misri told pressupersons that the Indian side thanked Mr. Dissanayake for the release of 47 Indian fishermen, who had been in Sri Lankan custody, in recent weeks. Further, citing the impact of the West Asian war on the global energy sector, he underscored the "urgency of" the proposed energy hub in Trincomalee, that included a possible fuel pipeline from south India, and the developing of the Second World War era oil tank farms in the eastern district.

Last month, Sri Lanka's Foreign Minister Vijitha Herath called the Trincomalee project the "permanent solution" to the energy crisis.

'We grow together'

In addition to calling on President Dissanayake, Mr. Radhakrishnan attended a luncheon meeting hosted by Prime Minister Harini Amarasuriya, before attending a reception with the Indian diaspora and members of the Malaiyaha Tamil community.

Speaking at the well-attended event in Colombo's Wellawatta neighbourhood – where many Tamils in the capital reside – Mr. Radhakrishnan announced that the Overseas Citizenship of India (OCI) card, a multiple entry lifelong visa extended to foreign nationals of Indian origin, would now be extended to sixth generation Indian-origin Sri Lankans.

He also assured that the process of obtaining the OCI card would be simplified to help applicants. "In my meeting with your President, I said we grow together," Mr. Radhakrishnan said, emphasising that India would always stand with Sri Lanka in the country's success and struggles, be an "affectionate elder brother".

Earlier, Mr. Radhakrishnan met with Leader of Opposition Sajith Premadasa and leaders of Tamil political parties from the north, east and the hill country. "We held constructive discussions on expanding trade, deepening economic ties, and unlocking practical opportunities that can benefit both our nations," Mr. Premadasa said in a social media post.

- **Key Terms and Explanations**
- **Neighborhood First Policy:** India’s foreign policy priority to improve ties with its immediate neighbors through connectivity, trade, and development assistance.
- **OCI (Overseas Citizenship of India) Card:** A form of residency status for foreign citizens of Indian origin, allowing them to live and work in India indefinitely.
    - *Example:* Extending this to "sixth generation" Sri Lankans of Indian origin expands the cultural and legal bridge between the two nations.
- **Trincomalee Energy Hub:** A strategic project in Sri Lanka's eastern port city involving oil tank farms and renewable energy. Its proximity to the Bay of Bengal makes it a vital maritime asset.
- **Memorandum of Understanding (MoU):** A formal agreement between two parties that outlines a plan of action but is not usually a legally binding contract.
- **Malaiyaha Tamils:** Also known as "Hill Country Tamils," they are descendants of workers brought from India to Sri Lanka during the colonial era to work on plantations.

- **Main Arguments and Substantive Parts**
- The core thesis centers on **deepening bilateral integration** through energy connectivity and humanitarian diplomacy.
- **Energy Security as a Pillar:** India is pushing for the "Trincomalee Hub" and a cross-border fuel pipeline to create a stable energy corridor, reducing Sri Lanka's dependence on volatile global markets.
- **The "Elder Brother" Narrative:** India’s approach is moving from "Big Brother" (often perceived as domineering) to an "Affectionate Elder Brother," emphasizing support during crises (like the $450 million cyclone recovery package).
- **Diaspora and Identity:** By relaxing OCI norms for the Malaiyaha Tamil community, India is leveraging "soft power" to ensure the welfare of the Indian-origin population while strengthening social ties.
- **The Fishermen Issue:** A recurring friction point involving the arrest of Indian fishermen. The argument here is for a "humanitarian solution" rather than a purely legalistic or punitive one.

- **Historical Evolution of the Issue**
- **Pre-Independence & Colonial Era:** Deep-rooted cultural and religious links (Buddhism). Large-scale migration of Indian labor to Sri Lankan tea estates.
- **Post-Independence (1948–1980s):** Initial cooperation followed by tension over the citizenship status of Indian-origin Tamils (Srimavo-Shastri Pact, 1964).
- **The Ethnic Conflict (1983–2009):** The Civil War between the Sri Lankan state and LTTE. India's involvement via the IPKF (Indian Peace Keeping Force) led to a period of diplomatic strain.
- **Post-War Reconstruction (2009–Present):** India shifted focus to infrastructure, housing (Indian Housing Project), and balancing the growing Chinese footprint in the island nation.
- **The 2022 Economic Crisis:** India provided nearly $4 billion in aid, marking a "reset" in ties and establishing India as the first responder.

- **Way Forward**
- **Institutionalize Energy Ties:** Fast-track the India-Sri Lanka power grid interconnection to allow seamless electricity trade.
- **Blue Economy Cooperation:** Jointly manage the Palk Bay resources to resolve the fishermen issue through deep-sea fishing incentives.
- **Cultural Diplomacy:** Leverage the Buddhist circuit to enhance tourism and people-to-people ties.
- **Timely Project Delivery:** India must ensure that the Trincomalee project meets deadlines to prove its reliability as a development partner.

- **Previous Years' UPSC Questions**
- **2022 (GS-2):** "India is an age-old friend of Sri Lanka." Discuss India's role in the recent crisis in Sri Lanka in the light of the preceding statement.
- **2013 (GS-2):** In the context of the newly formed government in Sri Lanka, discuss India's options.
- **Prelims (2020):** Questions on the "Eleventh Schedule" or "Location-based questions" (Trincomalee/Hambantota).

AXIA IAS ACADEMY
AXIA COMPETITIVE EXAM CENTRE

INDIA–SRI LANKA RELATIONS: A COMPREHENSIVE UPSC ANALYSIS

STRATEGIC & DIPLOMATIC

- Neighborhood First Policy (Sustained Engagement)
- SAGAR (Security and Growth for All)
- Trincomalee Strategic Hub

ECONOMIC INTEGRATION

- $450m Cyclone Aid Package
- Multi-sectoral MoUs (Education, Health, Tourism, Trade)
- Port Development & Investments

HISTORICAL & CULTURAL

- Civilizational & Ancient Links (Ashoka)
- Buddhism as a cultural bridge
- Malaiyaha Tamil Community (Plantation Workers)

SOCIO-ETHICAL ISSUES

- Recurring Fishermen Conflict (Humanitarian Solution)
- Overseas Citizenship of India (OCI) - 6th Generation Extension
- Ethics of State Sovereignty & Livelihoods

SUSTAINABLE COOPERATION

- Trincomalee Oil Tank Farms
- Cross-border Fuel Pipeline (India to SL)
- Sustainable, Ethical Resource Use

UPSC KEY CONCEPTS & LINKAGES

- GS-2: International Relations (Neighborhood First)
- GS-3: Energy Security & Infrastructure
- Essay Topics: Geopolitics & Geoeconomics
- NCERT Link: Ch on South Asia in Cont. World Politics

WAY FORWARD: A 5-POINT STRATEGIC BLUEPRINT

1. Institutionalize Energy Grid
2. Invest in Port Infrastructure
3. Expedite MoU Implementation
4. Leverage Diaspora Ties
5. Prioritize Blue Economy Cooperation

AXIA COMPETITIVE EXAM CENTRE – RISE ABOVE THE REST
Visit Us: axiaiasacademy.com | Contact: +91 6002-417488

'Nuclear plants require lifetime commitment'

Jacob Koshy
NEW DELHI

As India opens its nuclear power sector to private participation under the newly enacted SHANTI Act, former regulators of the nuclear energy establishment and policy veterans said that nuclear power required "lifetime commitment," and maintaining "financial security" to account for "waste management, settlement of claims (caused by radiation), and decommissioning (nuclear power plants).

The Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI) Act, 2025, as the government has articulated repeatedly, is to help India raise its installed nuclear power capacity from the existing 8.7 gigawatt (GW) to 100 GW by 2047. Unlike the previous half-century, it hopes to achieve this by allowing, in theory, private companies to run nuclear power plants and harness foreign funds for the purpose. Ravi Grover, member, Atomic Energy Commission and veteran nuclear engineer, at a talk in New Delhi on Saturday, said the SHANTI Act clearly prescribed duties and liabilities that power plant operators must adhere to, whether in the private or public sector.

The SHANTI Act reflects the effort to modernise the laws governing the nuclear sector.

"The prime responsibility for safety, security and safeguards lies with the licensee...Section 10 of the Act clearly and transparently spells out what a newcomer to the sector should know...there is no place for indulging in regulatory tricks. No one can fudge the half life of a radioisotope. If it is 30 years, it remains 30 years," he said.

Rajan Raghavan, vice-president, Tata Consulting Engineers Ltd., who represented Indian private sector companies interested in expanding their presence in India's nuclear power sector, said four priorities shaped investment decisions: site selection, affordable technology, government hand-holding, and tariff viability.

The 700 MW indigenous pressurised heavy-water reactor, Mr. Raghavan said, which the Nuclear Power Corporation of India Ltd. (NPCIL) – a public sector company which is the sole operator of nuclear plants – plans to deploy in fleet mode over the next 10 to 12 years, was the "natural choice".

The 220 MW design, though indigenous, was finalised 15 years ago and would need substantial rework to meet current regulatory and safety benchmarks.

Foreign reactors, he cautioned, came with prohibitive costs and lengthy design-validation timelines for Indian conditions – "two to three years" before construction could even begin.

Legal framework

Former Atomic Energy Regulatory Board Chairman. D.K. Shukla offered the regulator's view, arguing that the SHANTI Act finally provided a "unified legal framework" that separated control regulation from safety regulation – a clarity that was implicit earlier only because every player sat within the Department of Atomic Energy.

With private entities entering, he warned that issues previously considered minor would now become major. A central concern Mr. Shukla flagged was the lifetime commitment of nuclear operation demands. The Act, he noted, now required licensees to "maintain design support throughout the lifetime of the facility" – a requirement far weightier for nuclear than for other power plants, given the longer operating life. Every 10 years, operators must undertake a periodic safety review to demonstrate compliance with current safety standards.

"How do you modify or incorporate the new safety upgrade if you do not have the full-fledged design information and capability?" he said, pointing out that changes to one system can cascade adversely through others.

Design integrity must be preserved throughout the plant's life, he stressed, "whether technology is developed within the country or it is imported" – a pointed caution for private players contemplating foreign reactor imports without securing long-term design support arrangements.

- **Key Terms and Explanations**
- **SHANTI Act, 2025:** The "Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India" Act. It is the legislative vehicle designed to modernize nuclear laws and allow private sector participation.
- **Pressurised Heavy-Water Reactor (PHWR):** A nuclear reactor that uses unenriched uranium as fuel and heavy water (D_2O) as both a coolant and a moderator. India's indigenous 700 MW designs are of this type.
- **Half-life:** The time required for a quantity of a radioactive substance to reduce to half of its initial value. It is a physical constant that underscores why nuclear waste management requires multi-generational planning.
- **Decommissioning:** The administrative and technical process of safely retiring a nuclear facility at the end of its life, involving the handling of radioactive materials and site restoration.
- **Design Support:** Continuous technical assistance from the original designer to ensure the plant can be upgraded or repaired throughout its 40–60 year lifespan.
- **Tariff Viability:** The ability to sell generated electricity at a price that covers high capital costs while remaining competitive with solar or coal.

- **Main Arguments and Substantive Parts**
- The core thesis of the current discourse is that **nuclear energy is not a "plug-and-play" business**; it requires a "lifetime commitment" that transcends typical corporate timelines.
- **Financial and Safety Security:** Private players must account for long-term liabilities, including waste management and potential radiation claims, which could emerge decades after the plant starts operating.
- **Regulatory Independence:** A major achievement of recent legislation is the clear separation of "control" (operation) from "regulation" (safety). This prevents the conflict of interest that existed when the regulator and operator sat under the same administrative umbrella.
- **The Foreign Technology Trap:** Importing reactors is risky if long-term design support isn't secured. Without the "full-fledged design information," local operators cannot easily incorporate new safety upgrades mandated by evolving global standards.
- **The "Fleet Mode" Strategy:** To reach the goal of 100 GW by 2047, the government suggests deploying indigenous 700 MW reactors in "fleet mode" (building several identical units at once) to ensure cost-efficiency and standardization.

- **Historical Evolution of the Issue**
- **Phase 1 (1948–1974):** Establishment of the Atomic Energy Commission (1948) and Department of Atomic Energy (1954). Focus was on building basic infrastructure and international cooperation (e.g., CIRUS reactor).
- **Phase 2 (1974–2008):** Following the "Smiling Buddha" test, India faced international isolation and technology denials. This forced the development of indigenous PHWR technology.
- **Phase 3 (2008–2024):** The Indo-US Civil Nuclear Deal and the NSG waiver integrated India into the global nuclear trade. However, the Civil Liability for Nuclear Damage Act (2010) created friction with foreign suppliers.
- **Phase 4 (2025–Present):** The SHANTI Act marks the transition from a state monopoly to a public-private partnership model to meet aggressive Net Zero targets.

- **Way Forward**
- **Streamlined Financing:** Creating a "Nuclear Green Fund" to provide low-interest loans to private players.
- **Skilled Workforce:** Establishing specialized nuclear engineering tracks in IITs to support the 100 GW target.
- **Public Awareness:** Science-based outreach to demystify radiation and explain the safety features of modern reactors (e.g., passive cooling systems).
- **R&D on Thorium:** Continuing the three-stage nuclear program to utilize India’s vast thorium reserves for true long-term independence.

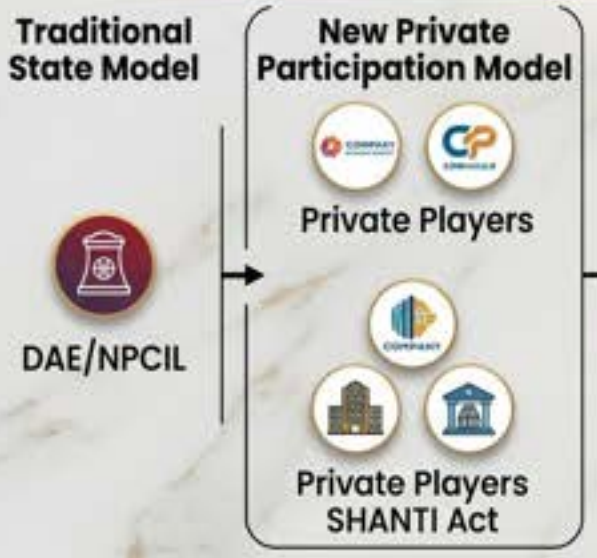
- **Previous Years’ Questions (PYQs)**
- **UPSC Mains 2017 (GS 3):** "With growing energy needs, should India keep on expanding its nuclear energy programme? Discuss the facts and fears associated with nuclear energy."
- **UPSC Mains 2018 (GS 3):** "Give an account of the growth and development of nuclear science and technology in India. What is the advantage of a fast breeder reactor programme in India?"
- **UPSC Prelims 2020:** Question regarding the "International Atomic Energy Agency (IAEA) Safeguards."

AXIA IAS ACADEMY

RISE ABOVE THE REST

Website: axiaiasacademy.com | Contact: +91 6002-417488

INDIA'S NUCLEAR ENERGY PARADIGM SHIFT



KEY REGULATORY MECHANISMS

- 10-Year Safety Review
- Design Support
- Fiirer Support
- Nuclear Management
- Information Report

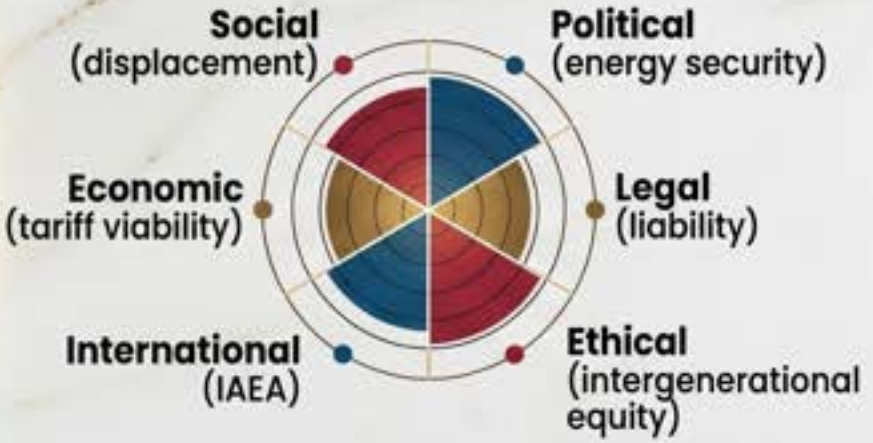
LIFETIME COMMITMENT
Nuclear waste management

CHALLENGES (Obstacles)

- **Implementation** (land acquisition and evolument)
- **Safety retrofits** (older 220MW designs designs and need its system)
- **Public perception:** (incommenonation and imnationae or society)

MULTIDIMENSIONAL ANALYSIS

(Multidimensional icons)



SYLLABUS LINKAGES

UPSC

- **GS 2** (Regulatory bodies)
- **GS 3** (Infrastructure/S&T)
- **Essay** (Sustainable Dev.)
- **Ethics**

MINISTER TO HOLD HIGH-LEVEL INTERACTIONS DURING 3-DAY VISIT

Rajnath's Germany Visit Focus: Defence Industry Coop, Weapons' Coproduction

Trip comes when India is looking to collaborate with European partners for defence technology

Manu Pubby

New Delhi: India and Germany are set to sign a defence industrial cooperation roadmap and explore opportunities for joint development and production of weapon systems during defence minister Rajnath Singh's three-day visit to the European nation.

Singh is undertaking an official visit to Germany from April 21 to 23 and is scheduled to hold bilateral talks with his German counterpart Boris Pistorius and other senior leaders of the government. This will be the first visit by an Indian defence minister to Germany in seven years and comes at a time when India is looking to collaborate closely with European partners for defence technology.

"Discussions will focus on enhancing defence industrial collaboration, strengthening military-to-military engagements and exploring opportunities in emerging domains such as cyber security, artificial intelligence and drones," officials said.

They added that a defence industrial cooperation roadmap and implementing arrangement for cooperation in UN Peacekeeping Operations Training are likely to be signed in the presence of defence ministers.

As reported by **ET**, the visit will include talks on industry collaboration as well as a special defence investor summit that is likely to be attended by top military manufacturers of both nations. A special India-Germany defence investor summit has been planned at Munich that aims to engage with leading German defence industry stakeholders to explore avenues for collaboration, investment and partnerships.

The two nations have been expanding bilateral cooperation, including in defence technology sharing. India is on the verge of signing a $10 billion deal for new conventional submarines, for which German firm TKMS is the technology partner. The six submarines being acquired will be equipped with air independent propulsion that enables them to stay underwater for weeks.

An intergovernmental agreement that will be the overarching arrangement for the mega contract has already been finalised between the two countries and the formal signing is expected to take place shortly. The submarines are to be manufactured by Mazagaon Dockyards Limited, with indigenous content of over 50%.

Indian companies are also interested in offering their products for the German armed forces and other European forces, hoping to get orders as defence spending is ballooning across the continent. Some companies are looking to acquire stakes in German firms to get technology that can be used to make defence systems at scale in India.

Bilateral Talks

Rajnath Singh is undertaking an **official visit to Germany from April 21 to 23** and is scheduled to hold bilateral talks with his **German counterpart Boris Pistorius** and other senior leaders of the government

Defence industrial cooperation roadmap and implementing arrangement for partnership in UN Peacekeeping Operations Training are likely to be signed during the visit

SUBMARINE PARTNER

India is close to signing a $10 b deal for new conventional submarines, for which German firm TKMS is a tech partner

- **Key Terms and Explanations**
- **Defence Industrial Cooperation Roadmap:** A strategic blueprint between two nations to synchronize their defense industries. It moves beyond a buyer-seller relationship to joint research and production.
    - *Example:* Collaborating to design a new radar system rather than just buying one.
- **Co-production:** The joint manufacturing of defense equipment where both nations share technical expertise and labor.
- **Air Independent Propulsion (AIP):** A marine propulsion technology that allows non-nuclear submarines to operate without access to atmospheric oxygen (surfacing or using a snorkel). This significantly enhances the submarine's stealth by allowing it to stay submerged for weeks.
- **Intergovernmental Agreement (IGA):** A formal pact signed between two sovereign governments. This adds a layer of diplomatic security and often bypasses some of the bureaucratic hurdles of private commercial bidding.
- **Conventional Submarines:** Diesel-electric submarines that are primarily used for coastal defense and regional power projection, as opposed to nuclear-powered ones.

- **Main Arguments and Substantive Parts**
- The core thesis focuses on India’s strategic pivot toward European partners, specifically Germany, to diversify its defense hardware and acquire high-end technology.
- **Technology Transfer for Submarines:** The $10 billion Project-75I (P-75I) is the centerpiece. The argument is that German technology (via TKMS) combined with Indian manufacturing (Mazagaon Dockyards) creates a win-win: India gets stealthy submarines, and Germany secures a long-term strategic market.
- **Indigenous Content Over 50%:** A critical point is the commitment to high indigenization. This ensures that the majority of the value and technical skill stays within India, fostering a domestic defense ecosystem.
- **Beyond Equipment:** The interaction isn't just about hardware; it includes cooperation in **UN Peacekeeping** and emerging domains like **Cyber Security, AI, and Drones.**
- **Strategic Autonomy:** By engaging Germany, India reduces its historical over-reliance on Russian defense equipment, especially critical in the current global climate.

- **Historical Evolution of the Issue**
- **Cold War Era:** India and Germany (specifically West Germany) maintained cordial but limited defense ties. India was heavily reliant on the USSR, while West Germany was integrated into NATO.
- **Post-1991 Liberalization:** Relations warmed with the "Strategic Partnership" signed in 2001. Defense cooperation began to grow, though it remained overshadowed by trade in the automotive and machinery sectors.
- **The 2010s Shift:** The "Make in India" initiative (2014) signaled a shift. India began demanding technology transfers rather than off-the-shelf purchases.
- **Present Day (2020s):** The Russia-Ukraine conflict and the rise of China in the Indo-Pacific have acted as catalysts. Germany's *Zeitenwende* (historic turning point in defense policy) and India's need for advanced submarine tech have converged.

- **Way Forward**
- **Fast-track Special Purpose Vehicles (SPVs):** Create dedicated units to handle the P-75I project to avoid traditional red tape.
- **Focus on MSMEs:** Ensure that the 50% indigenous content includes small and medium enterprises to create a robust industrial base.
- **Joint R&D:** Move beyond "manufacturing someone else's design" to "jointly designing for the future."
- **Diplomatic Flexibility:** Maintain a clear dialogue with other partners to ensure this bilateral growth isn't perceived as a zero-sum game.

- **Previous Years' UPSC Questions (PYQs)**
- **GS 2 (2021):** "The newly emerged Russia-China axis has the potential to overshadow the existing patterns of India's foreign policy." (Relevant due to the shift toward Western partners like Germany).
- **GS 3 (2018):** "What is the significance of Indo-US defence deals over Indo-Russian defence deals? Discuss with reference to stability in the Indo-Pacific region." (Can be adapted for India-Germany/EU).
- **Prelims (2017):** Questions on MTCR and submarine tech (Scorpene class).

AXIA IAS ACADEMY
knowledge sponsor.

Comprehensive Analysis for UPSC CSE: India-Germany Defence Cooperation

Strategic Pivot & Key Terms

Defence Industrial Cooperation Roadmap
Defence Industrial cooperation roadmap of defence in fnncal ocsoatnarship and thameys

Co-production
Factory us to contribute, workany, co-production and indiste paramment

Air Independent Propulsion (AIP)
Diesel-electic air independent propulsion (AIP)

Intergovernmental Agreement (IGA)
Defence Industrial Cooperation Roadmap

Conventional Submarines - Long-everent (Conventional Submarines or submarries in AIP)

Timeline: February 2022 — Indian Ocean — January 2023 — Conventional February 2024

Multidimensional Analysis

- **Social**: Summary 1-2 social sociality interests
- **Political**: Handshakt & handshake in tilis
- **Legal**: Balanced Legal crauned calance
- **Ethical**: Summary 1-2 ethicarl ethual amins
- **International**: Summary 1-2 internationals
- **Economic**: Summary 1-2 economioric markets

Challenges

- Bureaucratic Delays
- Encrypted IPR
- IPR Process

Logical Base & UPSC Linkages

Realism & Pragmatism

Interlocking cogs of national interest

Strategic Convergence

Germany India

Converging vectors for Germany and India

NCERTs	GS Papers
GS 2	• Official Syllabus Terminology - Mapping and • Official Syllabus)
GS 3	• Mappping (GS 2 Syllabus • Official Syllabus)
Essay	• Official Syllabus Syllabus

Way Forward & Selected PYQs

- SPVs for P-75I
- Empowering MSMEs
- Joint R&D
- Diplomatic Flexibility

- 3 selected PYQ: Insoley and action (uneit truncaved and referenced)
- 3 selected PYQ: Examany wod germany vecholosxher automated as RR and referenced)
- 3 selected PYQ examples (truncated erencoment er enoncated as Irli and referenced)

AXIA IAS ACADEMY.
Website: axiaiasacademy.com
Contact: +91 6002-417488

PRESSURISED HEAVY WATER REACTORS WILL ANCHOR GROWTH UNTIL TECH MATURES

'Fast breeder reactors to play key role in long-term energy security'

WITH INDIA'S first indigenous fast breeder reactor (FBR) at Kalpakkam reaching criticality, indigenous FBRs are likely to play a critical role in the country's long term energy security, according to **Bhuwan Chandra Pathak**, Chairman and Managing Director at Nuclear Power Corporation of India Ltd (NPCIL). While fast breeder reactors represent the future, Pressurised Heavy Water Reactors (PHWRs) will continue to play their pivotal role until the technology matures, he said in an interview with **Pratyush Deep**. And as India deregulates the nuclear power sector, Pathak said NPCIL will play a "motherly role" in fostering private participation through technology, project development, and design. Edited excerpts:

With the country's first indigenous FBR at Kalpakkam attaining criticality, how do you see the technological trajectory of India's nuclear sector? In long term, what roles do thorium-based reactors, Light Water Reactors (LWR), and others play?

Our nuclear power program is based on the sequential three-stage programme where in the first stage is pressurised heavy water reactor (PHWR) using natural uranium. The fuel for the FBR reactor (in the second stage) comes from the PHWR, which is plutonium. Because the yield of plutonium is very good in PHWR. As stated, the fuel for the FBR reactor is plutonium plus depleted uranium. FBR reactors initially use plutonium plus depleted uranium to obtain Uranium 233 from the Thorium -232 which is used as blanket in such reactors. Thus, we breed more fuel than we consume and hence it is named Breeder Reactor. In the third stage, it is Thorium-232 which will get converted into uranium U-233 which would be fuel for the advanced reactors. This is how it completes the whole nuclear power program and we will become self-independent as far as fuel is concerned. FBR is basically one of the intermediate steps in completion of our three stage program. Worldwide, people usually opt for pressurized water reactors (PWR, or light water reactors) wherein enriched uranium is used because they have a good stock of uranium. However, we were in the technological denial regime, we did not go for PWR and opted for PHWR. While natural uranium is in modest amount in India, we have a huge amount of thorium. So, it is really a major achievement for the country and paves way for energy security in all respects, including the fuel.

What will the future nuclear power basket be like?

There could be various technologies within nuclear power. Firstly, we have PHWR, a technology that we have mastered. We have now developed 700 MWe capacity size of PHWRs. Three of such units have been operating very successfully now. Secondly, we also have two reactors at Kudankulam of 1,000 MWe capacity based on PWR technology.

The technology for this has been provided by the Russian Federation and of course we were responsible for its construction, commissioning, operation and maintenance.

Further, we also have two reactors based on boiling water reactor technology, namely TAPS-1& 2 at Tarapur in Maharashtra. Similarly, fast breeder reactors will also be one of the components of this clean electricity source. The fuel for PHWR is available in adequate quantity for the present needs. However, with the kind of clean energy expansion planned, it may pose some challenges. So, subsequently fast breeder reactors are likely to fill the gap. That is why fast breeder reactors will support the rising requirement in future, but until the technology attains maturity, PHWRs will keep playing their pivotal role.

EXPRESS interview

BHUWAN CHANDRA PATHAK
CHAIRMAN AND MD, NPCIL

As India deregulates the nuclear power sector, Pathak said NPCIL will play a 'motherly role' in fostering private participation through technology, project development, and design

How does NPCIL envision its role in supporting India's long-term energy security as it opens nuclear power sector to greater private participation?

NPCIL is a pioneering company in nuclear power development as well as generation. In the journey, we have evolved and developed the 700 MWe PHWR, which is going to be a mainstay of our indigenous nuclear power programme. We already have a programme to take the current level of installed capacity to 22 GWe by 2031-32, and by 2047 our plan is to take it to about 54 GWe from NPCIL alone. So, NPCIL will continue to play a pivotal role in supporting the industry and all players who want to enter the nuclear power sector in terms of providing technology. NPCIL will support them in setting up projects if they wish to adopt PHWR-based technology.

It will play a kind of motherly role, supporting the industry to reach the scale it aspires to. This support is not limited to technology — NPCIL is a company with capabilities across multiple domains. We are involved in site selection, design, engineering, construction, commissioning, operation and maintenance, waste management, upgradation, ageing management and quality assurance. These are the areas where NPCIL may play, or rather will play, a role — of course within resource constraints, as we have our own programme to execute. In addition to these areas, we are involved in renovation and modernisation of plants, as we have been operating reactors for the past 40-50 years. Some reactors have been modernised, and we have developed this capability at a very low cost. So, there are some reactors which we have modernized. We have that technology available at a very low cost. Now, we have expertise in complex-in-core jobs that too at a very low cost.

Despite a longstanding civil nuclear programme, capacity addition has been gradual over the past 5 decades. From NPCIL's view, what factors are behind it and how are they addressed?

Of course, our programme started in the 1950s–60s, and there was a technology denial and embargo regime from 1974 onwards. So, we had to be on our own and develop everything — from technology to manufacturing. That took considerable time. We focused on modernising and standardising our 220 MWe reactors, and then moved to the 540 MWe reactors at Tarapur, which were completed in a record time of 'less than five years. Subsequently, we developed the 700 MWe reactors with only limited changes from the 540 MWe design. These reactors are now operating very well. At present, we have 24 reactors in operation, excluding one which is under prolonged shutdown. Seventeen reactors are at different stages of implementation.

Once these 17 reactors are completed, our total installed capacity will increase to 22 GWe. Initially, there were delays, but after the 1-2-3 agreement, the fuel supply improved, and our capacity factors improved significantly. Now, as many reactors are under construction and planned, we have a clear roadmap to move from 22 GWe to 54 GWe. We have already acquired most of the land required for upcoming reactors, the technology for the 700 MWe units is largely frozen. There is also a very positive ecosystem now. When we started, there was limited support from industry, and we had to develop vendors ourselves, as we were the only agency placing orders. Now, multiple agencies will be active in the sector, creating more opportunities for manufacturers and contractors across electrical, mechanical, and civil segments among others. This ecosystem is expanding, which will help scale up the programme. Of the 17 reactors under implementation, the first one — RAPS-8 at Rajasthan is expected to be commissioned this year. Overall, everything is in the pipeline now. With supportive policies and growing trust — not just in NPCIL and sectoral players but in the industry as a whole — there is a positive momentum. I am confident that progress will further accelerate going forward.

FULL INTERVIEW ON
WWW.INDIANEXPRESS.COM

- **Key Terms and Explanations**
- **Criticality:** The state of a nuclear reactor when the fission chain reaction is self-sustaining. Achieving "first criticality" means the reactor is officially operational.
- **Pressurised Heavy Water Reactor (PHWR):** A nuclear reactor that uses unenriched **natural uranium** as fuel and **heavy water** (D_2O) as both coolant and moderator.
- **Fast Breeder Reactor (FBR):** A reactor that generates more fissile material than it consumes. It uses "fast" (unmoderated) neutrons to convert fertile material (like Uranium-238) into fissile material (Plutonium-239).
- **Three-Stage Nuclear Power Programme:** A plan formulated by Homi J. Bhabha to utilize India's vast thorium reserves.
  - **Stage 1:** PHWRs using natural uranium.
  - **Stage 2:** FBRs using plutonium (from Stage 1) and thorium blankets.
  - **Stage 3:** Advanced reactors using Uranium-233 (bred from Stage 2).
- **GWe (Gigawatt-electric):** A unit of electric power equal to one billion watts. It measures the output capacity of a power plant.
- **Technological Denial Regime:** A period where international bodies (like the NSG) restricted India's access to nuclear technology and fuel following the 1974 "Smiling Buddha" test.

- **Main Arguments and Substantive Parts**
- The core thesis posits that **Fast Breeder Reactors are the indispensable bridge** between India’s current reliance on uranium and its future energy independence via thorium.
- **Strategic Transition:** While PHWRs are the current mainstay, they are limited by India’s modest uranium reserves. FBRs are necessary to "breed" the fuel required for the third stage.
- **Self-Reliance (Atmanirbharta):** The indigenous development of the FBR at Kalpakkam is presented as a triumph over decades of international technology denials.
- **Private Sector Integration:** A major shift is occurring where the state-run NPCIL is moving from a sole executor to a "motherly" mentor, fostering private industry participation in design and construction.
- **Capacity Expansion:** There is a clear roadmap to scale from the current capacity to 22 GWe by 2031-32, and eventually 54 GWe by 2047, through a mix of indigenous PHWRs, FBRs, and imported Light Water Reactors (LWRs).

- **Historical Evolution of the Issue**
- **1950s:** Formulated by Dr. Homi J. Bhabha, focusing on a closed fuel cycle to exploit thorium.
- **1974 (Pokhran-I):** India’s peaceful nuclear explosion led to the formation of the Nuclear Suppliers Group (NSG) and a "technology denial regime," forcing India to develop indigenous PHWR technology.
- **1980s-90s:** Development of 220 MWe and 540 MWe indigenous PHWRs (e.g., Tarapur, Rajasthan).
- **2008 (Civil Nuclear Deal):** The Indo-US deal and NSG waiver allowed India to import high-capacity LWRs and uranium, ending its isolation.
- **Present Day:** The commissioning of the Prototype Fast Breeder Reactor (PFBR) at Kalpakkam marks the definitive start of the **Second Stage**.

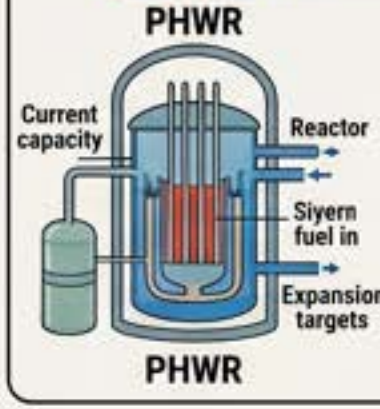
- **Way Forward**
- **Regulatory Reform:** Streamlining the Atomic Energy Regulatory Board (AERB) to ensure faster approvals without compromising safety.
- **Private Participation:** Incentivizing private players through a structured "Vendor Development Program" as suggested by the NPCIL Chairman.
- **Public Outreach:** Transparent communication to demystify nuclear energy and address safety concerns of local communities.
- **International Collaboration:** While focusing on indigenization, India should continue small-modular reactor (SMR) research with global partners to diversify its basket.

- **All Previous Years’ UPSC Questions**
- **Mains 2017:** "Give an account of the growth and development of nuclear science and technology in India. What is the advantage of fast breeder reactor programme in India?"
- **Mains 2018:** "With growing energy needs, should India keep on expanding its nuclear energy programme? Explain the facts and fears associated with nuclear energy."
- **Prelims 2015:** Question on the purpose of "International Atomic Energy Agency (IAEA) safeguards."
- **Prelims 2020:** Question regarding "Uranium deposits in India."

INDIA'S PATH TO NUCLEAR SELF-RELIANCE: A COMPREHNSIVE UPSC CSE ANALYSIS

The Three-Stage Programme

STAGE 1: CURRENT MAINSTAY

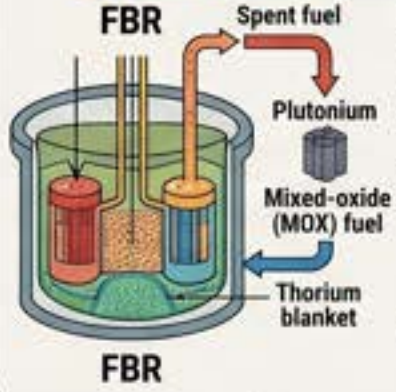


PHWR Reactors (Natural Uranium)

- NPCIL Standardized 220 MWe, 540 MWe, 700 MWe designs
- Current capacity (e.g., ~7.5 GWe), expansion targets (22 GWe by 2031)

Key: Mastery of PHWR technology

STAGE 2: THE CRITICAL BRIDGE

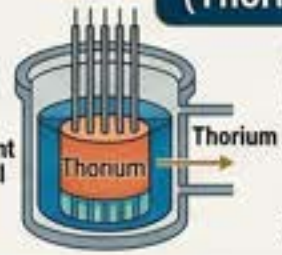


Fast Breeder Reactors (Kalpakkam PFBR)

- Indigenous Technology
- High Plutonium Yield
- Breeds more fissile material than it consumes

Key: Bridge to Stage 3

STAGE 3: THE ULTIMATE GOAL (Thorium-U233)



Advanced Thorium Cycle (U233 as fuel)

- Utilize vast domestic Thorium reserves

Self-Reliance (Atmanirbharta)

NPCIL's New "Motherly Role"

"Motherly Role" (Incubator/Mentor) → private industry integration

Outcomes:

- Local Manufacturing
- Faster Project Delivery (Fleet Mode)
- New Job Creation
- competitive ecosystem

Multidimensional Impact

Social	Economic	International	Environmental
• Energy Security • Base Load Power • High-Skill Jobs	• Indigenization • Reduced Fuel Imports • Fleet Mode Efficiency	• Strategic Autonomy • Non-NPT Waiver Status	• Low Carbon • Net Zero Goals (2070)

Timeline

1950s — Bhabha's Vision (Closed Fuel Cycle)

1974 — Pokhran-I (Smiling Buddha) → Tech Denial Regime (NSG)

1980s-90s — Indigenous PHWRs developed

2008 — Indo-US Civil Nuclear Deal (NSG Waiver)

Present — Kalpakkam FBR achieves Criticality (Start of Stage 2)

AXIA IAS ACADEMY
AXIA COMPETITIVE EXAM CENTRE

• WAR IN WEST ASIA

Why US and Iran are stuck in the threats-talks circle

For the US, nuclear programme negotiations are distinct from the current ceasefire talks. For Iran, they are inextricably linked.

EXPERT EXPLAINS

BASHIR ALI ABBAS

SENIOR RESEARCH ASSOCIATE, COUNCIL FOR STRATEGIC AND DEFENCE RESEARCH

US PRESIDENT Donald Trump has announced that US representatives will be in Islamabad on Monday evening, and if Iran does not take the "very fair and reasonable deal" being offered, the US would "knock out every single Power Plant, and every single Bridge, in Iran."

The first round of negotiations last weekend did not lead to an agreement. Statements from both sides have since shown they are stuck in a quagmire of differing aims and a deep trust deficit.

Twin negotiations with different objectives

There are two distinct negotiating efforts constantly merging into each other.

The first is the historic political issue of US objections to Iran's nuclear programme, an approximately 30-year-old dispute that has featured in recurring, usually indirect, negotiations between Washington and Tehran.

The second is the more recent military issue of the US/Israeli war on Iran that began on February 28, and is now centred around Iran's control of the Strait of Hormuz.

Given that this new character of the Strait is a direct product of the war, the US looks to discuss it as part of the current ceasefire, and distinct from the nuclear issue. Functionally, this would mean Iran opens the Strait in return for the US extending the ceasefire, and this enables negotiations for a broader political agreement — another nuclear deal.

For Iran, control of Hormuz is not a presumed temporary aspect. Iran now looks to use its Hormuz leverage to force a dilution of US demands and gain concessions across the board. This includes US guarantees against further attacks, unfreezing of Iranian assets, sanctions relief, and recognition of US rights to Iranian enrichment, among others.

This stark divergence is arguably why the April 11 Islamabad Talks yielded no outcome.

Iran's Parliamentary Speaker Mohammad Bagher Ghalibaf (right) meets Pakistan's Army Chief Field Marshal Asim Munir in Tehran, Iran, on April 10.

Fresh challenges

For Iran, extension of this ceasefire consistently included the need for Israel to stop attacking Lebanon, in return for opening the Strait (with continuing Iranian regulations), something Israel had stridently opposed. However, ceasefire in Lebanon was announced last week, with Trump even saying in a social media post, "Israel will not be bombing Lebanon any longer. They are PROHIBITED from doing so by the USA".

While Trump also explicitly de-linked the Israel-Lebanon ceasefire from the US-Iran talks, it is evident that Washington in effect is pressurising Israel to not bomb the negotiation efforts.

Whether that leads to peace and stability is a different question. The issues of disarming Hezbollah or Israel's continued occupation of key Lebanese towns remain unaddressed. While Lebanon and Israel are conducting negotiations of their own, there is a very thin likelihood they will generate viable outcomes. The possibility of disarming Hezbollah was considerably thin even in September last year, when the Lebanese government announced its commitment to do so. Now, with Iran's ability to provide a Hormuz-linked cover to Hezbollah, such disarmament is more unlikely. This leaves Israel in an untenable position.

Trump factor

With the new US blockade, Iran's own blockade, and Israel's shaky nod to the Lebanon ceasefire, there are enough variables threatening the talks

•

But the fact that the Strait can't be opened through a quick military mission remains

Even if Israel acquiesces in the short term (long enough for the US to extricate itself from this quagmire), Washington itself has created new conditions through a US naval blockade of Iranian ports, which has disrupted but not halted Iranian oil shipping). This has caused Iran to make Hormuz's reopening further contingent on the US lifting this secondary blockade. On April 18 and 19, the IRGC Navy prevented both India and China-bound ships from transiting the Strait, with the former also facing gunfire.

Misreading signals

While both the United States and Iran ultimately desire a negotiated outcome, their determination to exit the war with some level of dominance over the other is creating a new escalation trap.

From Tehran's perspective, even if it is willing to concede the same unprecedented nuclear programme concessions to Washington as it did before the war, it cannot leave the table without securing a long-term insurance policy.

From Washington's perspective, not only must Iran not be allowed such insurance (which will also deny America an deterrence) but must also appear to have ceded to immediate US-imposed terms.

There is the added problem of the US President seemingly misreading Iranian signals for negotiations by posting possible Iranian offers on social media. This forced Iran to further entrench hardline positions.

This was evident on April 17/18.

At 6:15pm IST, Iran's Foreign Minister Abbas Araghchi announced the opening of the Strait to all commercial shipping in line with the Israel-Lebanon ceasefire, but along the new "coordinated" route that Iran had created. Notwithstanding Iranian expectations of the US lifting its blockade in return (even if sold as a US victory), at 6:57pm IST Trump posted that Iran had declared the Strait to be "fully open and ready for business and full passage". Crucially, Trump added, "but the naval blockade will remain in full force...until such time as our transaction with Iran is 100% complete."

Washington reining the off-ramp caused Tehran to harden, not dilute, its position. By 3:44am on April 18, Iranian Parliament Speaker MB Ghalibaf announced that "with the continuation of the blockade, the Strait of Hormuz will not remain open". Since then, the IRGC has reiterated Hormuz's closure, the off-ramp offered through Araghchi has been abandoned, and all Iranian actors are closing ranks around the hardline position of linking the current ceasefire talks with negotiations for a U.S.-Iran nuclear deal, removing the de-linking chance that the Lebanon ceasefire had offered.

Given the new US blockade, Iran's entrenchment of its own blockade, and Israel's shaky acquiescence to the Lebanon ceasefire, there are enough variables threatening the talks. Still, the fundamental truth that the Strait cannot be opened through the quick application of military force remains true. Even the new UK-France led European coalition (without the US) being mounted for Hormuz shipping is characterised as a "post-war" coalition, potentially mimicking the successful anti-piracy coalition that operated off the Horn of Africa across the 2010s.

Ultimately, the Iranian effort remains to prevent Washington from viewing the ceasefire objectives as 'terms of Iranian surrender' and to ensure equitable nuclear negotiations, which are still possible. The next round of talks in Islamabad should show how well Washington has or has not perceived Iran's position and its needs.

- **Key Terms and Explanations**
- **Strait of Hormuz:** A narrow waterway between the Persian Gulf and the Gulf of Oman. It is the world's most important oil "choke point" because of the massive volume of oil that flows through it daily.
- **Nuclear De-linkage:** The diplomatic strategy of treating nuclear non-proliferation talks as separate from regional conflicts (like the Israel-Lebanon war) to prevent a deadlock in one from freezing the other.
- **Secondary Blockade/Sanctions:** When a country (like the US) punishes third-party countries or companies for doing business with a sanctioned nation (like Iran).
- **Off-ramp:** A diplomatic term for a face-saving solution that allows two conflicting parties to de-escalate without appearing to surrender.
- **Assurance/Insurance Policy:** In diplomacy, these are guarantees (often legal or material) that a treaty will be honored even if a leadership change occurs in the future.

- **Main Arguments and Substantive Parts**
- The core thesis posits that negotiations are failing because both sides have fundamentally different views on how the "nuclear issue" relates to "regional stability."
- **The Divergent Goalposts:** The US views nuclear talks as a distinct, historic track. Iran, however, sees its control over the Strait of Hormuz as a lever to force concessions across the board—including sanctions relief and security guarantees.
- **The Trump Factor:** The US administration's "maximalist" approach—threatening to destroy infrastructure unless a "fair deal" is accepted—creates a high-pressure environment where any concession by Iran looks like a total surrender.
- **The Signaling Trap:** Both sides are misreading each other. When one side offers a potential "off-ramp" via social media or informal channels, the other side often hardens its stance to avoid looking weak, leading to an escalation trap.
- **The Strait as a Tool of War:** Iran is transitioning from viewing the Strait of Hormuz as a temporary tactical asset to a long-term strategic insurance policy against US and Israeli military pressure.

- **Historical Evolution of the Issue**
- **1953–1979:** The US-Iran alliance under the Shah; the US actually helped start Iran's nuclear program (Atoms for Peace).
- **1979 Revolution:** The turning point. The hostage crisis and the shift to an Islamic Republic turned the US and Iran into "Great" and "Little" Satans respectively.
- **The 1980s "Tanker War":** Iran and Iraq targeted each other's oil shipments in the Persian Gulf, setting the precedent for using the Strait of Hormuz as a military lever.
- **2015 (JCPOA):** The Joint Comprehensive Plan of Action offered a brief period of de-escalation where Iran limited nuclear activity for sanctions relief.
- **2018–Present:** The US withdrawal from the JCPOA and the "Maximum Pressure" campaign led to the current cycle of threats, naval blockades, and the merging of the nuclear issue with regional proxy wars.

- **Way Forward**
- **De-linking Issues:** The US should separate the Israel-Lebanon ceasefire from the nuclear file to achieve quick "small wins."
- **Institutionalized Communication:** Establishing a "Hotline" between the US Navy and the IRGC to prevent accidental escalations in the Strait.
- **Sanctions "Sunset" Clauses:** Providing clear, gradual, and irreversible steps for sanctions removal to build Iranian trust.
- **Regional Involvement:** Including India and China as mediators, as they have the most to lose from a Strait closure.

- **Previous Years' Questions (PYQs)**
- **UPSC 2017 (GS-2):** "The project 'Mausam' is considered to be India's answer to China's 'One Belt One Road'. Do you agree? Analyze." (Related to maritime influence).
- **UPSC 2020 (GS-2):** "India's relations with Israel have, of late, acquired a depth and diversity, which cannot be rolled back. Discuss." (Relevant to the regional conflict mentioned).
- **UPSC 2022 (GS-2):** "Discuss the significance of the Strait of Hormuz for India's energy security."

AXIA IAS ACADEMY

THE US-IRAN 'THREATS-TALKS' CIRCLE: A STRATEGIC DECONSTRUCTION

A COMPREHENSIVE ANALYSIS FOR CIVIL SERVICES PREPARATION | BASED ON FIELD RESEARCH AND ACADEMIC RIGOR

DIVERGENT GOALS

US	VS	IRAN
Nuclear de-linkage		Strait control and sanctions relief

STAKEHOLDERS

Trump-era rhetoric | IRGC | Israel | India/China

Israel | India/China

SIGNALING TRAP

STAKEHOLDERS

US → Trump-era rhetoric

IRAN → IRGC

ISRAEL

INDIA/CHINA → energy dependence

CHALLENGES

implementation risk → external pressures

MULTIDIMENSIONAL ANALYSIS

WAY FORWARD

- **Direct Communication** — Prioritize direct communication
- **Phased Sanctions Relief** — Phased sanctions selections
- **Regional Mediators** — Prioritizd regional mediators
- **Legal Guarantees** — Prioritized legal guarantees

RISE ABOVE THE REST


AXIA
IAS ACADEMY
RISE ABOVE THE REST
ESTD : 2024
UPSC CSE Classes - Prelims + Mains + Interview Guidance
• EXPERT FACULTY & MENTORSHIP
• COMPREHENSIVE STUDY MATERIAL
• REGULAR TEST SERIES & EVALUATION
• CURRENT AFFAIRS & ANSWER WRITING FOCUS
• SMALL BATCH SIZES FOR PERSONAL ATTENTION
axiaiasacademy.com
+91 6002-417488