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Daily News Analysis

# The Hindu Important News Articles & Editorial For UPSC CSE

## Wednesday,08 April, 2026

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## Page 02 : GS II : Indian Polity / Prelims Exam

The Sabarimala case originated with the 2018 Supreme Court judgment that struck down the ban on women of menstruating age (10–50 years) entering the Lord Ayyappa temple, citing it as a violation of the right to equality (Article 14). However, subsequent review petitions led to a reference to a larger nine-judge bench. The Centre's current stance argues that the 2018 verdict relied on a "straitjacket" definition of religion that fails to account for the diverse, non-canonical traditions within Hinduism.

# Strict definitions will suppress diversity in Hinduism, Centre tells SC in Sabarimala case

**Krishnadas Rajagopal**
NEW DELHI

The Union government has told the Supreme Court that a straitjacket definition of what constitutes a "religious denomination" or which religious practices are "essential" would "compress" the inherently plural nature of Hinduism expressed through diverse sects, groups, spiritual lineages, regional traditions, faith, practices, rituals, customs, and beliefs.

The Centre has made its position clear ahead of the maiden hearing of a series of writ and review petitions linked to the Sabarimala temple case scheduled to be heard by a nine-judge Bench headed by Chief Justice of India Surya Kant from April 7. The nine-judge Bench would also look into the larger question of the extent to which courts could engage in core matters of faith.

A nine-judge Bench led by Chief Justice of India Surya Kant hearing the Sabarimala temple entry issue in New Delhi on Tuesday. ANI

The written submissions of the Union government, represented by Solicitor-General Tushar Mehta, countered the September 2018 judgment of the Supreme Court which had held that devotees who visit the Sabarimala temple in Kerala were not a separate religious denomination called "Ayyappans" protected under Article 26 of the Constitution.

The five-judge Bench had dismissed the notion that the prohibition of women aged between 10 and 50 from entering the temple was an "ancient custom" of the religious denomination amounting to an "essential religious practice" protected under Article 25.

The 2018 judgment by a majority on the five-judge Bench concluded that there was "no identified group called '*Ayyappans*'". Every Hindu devotee could visit the Sabarimala temple.

The majority verdict in the Sabarimala case had concluded that the exclusion of menstruating women from Sabarimala temple was akin to treating them as the children of a "lesser God".

The Centre said the restrictive approach of the 2018 judgment invaded intra-religious diversity. Matters of faith, belief, doctrine, practice, observance, symbolism and modes of spiritual life vary from community to community.

**No written codes**

Drawing inflexible rules to define religious denominations and establish essential religious practices would lead to confusing results especially in religions like Hinduism which are devoid of any mandatory written codes or canonical texts. "Denominations, sects and religions with no canonical texts, and which are open to change, would find it very difficult to establish any aspects of their beliefs, practices or culture to be essential," the Centre submitted.

**Key Arguments by the Centre**

**1. Diversity vs. Rigid Definitions**

The Centre argues that Hinduism is inherently pluralistic, consisting of various sects, spiritual lineages, and regional traditions.

**The Problem with "Essentiality":** A rigid Essential Religious Practices (ERP) test—used by courts to decide which rituals are "core" to a religion—might "compress" this diversity.

**Lack of Canonical Texts:** Unlike "religions of the book," many Hindu traditions are oral or custom-based. Forcing these into a written, legalistic framework could alienate minority traditions within the faith.

**2. The Concept of "Religious Denomination"**

In 2018, the Court held that Sabarimala devotees are not a separate "religious denomination" (**Article 26**). The Centre counters this, suggesting that the criteria for a denomination should be flexible enough to protect specific local traditions like those of the "Ayyappans."

**3. Limits of Judicial Review**

The Solicitor General submitted that:

**Subjectivity of Judges:** Courts are not theological experts. Interpreting religious texts through a secular lens risks substituting "judicial philosophy" for "religious self-understanding."

**Constitutional Morality:** The Centre cautioned against using "constitutional morality"—a concept not explicitly defined in the text—to override long-standing traditions, as it could become a tool for subjective judicial overreach.

**4. Social Reform vs. Faith**

The government maintains that while social reform (like the abolition of untouchability) is a state responsibility, the exclusion of a specific age group based on the "Naishtika Brahmachari" (celibate) nature of the deity is a matter of faith, not gender discrimination.

**Constitutional Provisions at Stake**

| Article | Relevance in the Sabarimala Case |
|---|---|
| **Article 14** | Right to Equality; used in 2018 to strike down the ban. |
| **Article 25** | Freedom of conscience and free profession, practice, and propagation of religion. |
| **Article 26** | Freedom to manage religious affairs (the "denominational" right). |
| **Article 25(2)(b)** | Allows the State to make laws for "social welfare and reform" or opening Hindu religious institutions to all classes. |

**Significance**

**Constitutional Morality:** Understand how the Court uses this concept to harmonize individual rights with traditional practices.

**Essential Religious Practices (ERP) Test:** Note the evolution of this doctrine from the Shirur Mutt Case (1954) to the present.

**Judicial Activism vs. Restraint:** The case explores whether the judiciary should act as a "reformer" or a "protector" of pluralistic traditions.

**Federalism and Secularism:** The interplay between State laws (Kerala Hindu Places of Public Worship Rules) and Central Constitutional principles.

**Conclusion**

The Centre's submission serves as a reminder that India's secularism is not "strict separation" but a "principled distance" that must respect the country's vast cultural tapestry. The nine-judge bench's eventual ruling will not only decide the fate of Sabarimala but will also set a precedent for other sensitive issues, including the entry of Muslim women into mosques and Parsi women into Fire Temples. The challenge for the Court lies in ensuring that the pursuit of gender justice does not inadvertently lead to a homogenization of faith that erases the very diversity the Constitution seeks to protect.

**UPSC Prelims Exam Practice Question**

**Ques: "Constitutional Morality" in Indian polity primarily refers to:**

(a) Following traditions of society

(b) Adherence to the values and principles of the Constitution

(c) Judicial supremacy over legislature

(d) Religious morality in governance

**Ans: c)**

**UPSC Mains Exam Practice Question**

**Ques:** Critically examine the Essential Religious Practices (ERP) doctrine. Do you think courts should decide what is "essential" to a religion? **(150 Words)**

## Page 05 : GS III : Science and Tech / Prelims Exam

The achievement of criticality at the Prototype Fast Breeder Reactor (PFBR) in Kalpakkam on April 6, 2026, marks one of the most significant milestones in India's scientific history. By successfully sustaining a controlled nuclear chain reaction, India has officially transitioned into the second stage of its ambitious three-stage nuclear power programme.

# Fast breeder nuclear reactor at Kalpakkam takes 'critical' leap forward

**Jacob Koshy**
NEW DELHI

Marking a significant step forward in India's nuclear power programme, Prime Minister Narendra Modi, via a post on social media platform X late on Monday said that the prototype fast breeder reactor (PFBR) at Kalpakkam, Chennai, had achieved "criticality". This means that the nuclear reaction in the reactor had become safely self-sustaining, and was on its way to being able to produce electricity.

"Today India takes a defining step in its civil nuclear journey advancing the second stage of its nuclear programme...the PFBR at Kalpakkam has attained criticality...it is a decisive step towards harnessing our vast thorium reserves," Mr. Modi posted.

While it will be some months before the PFBR is powered up to its full capacity, and even longer before it produces useful electricity, multiple experiments have to be conducted at low power to check if it's running as expected, which must be evaluated by the Atomic Energy Regulatory Board before it grants a go-ahead for commercial power operation, this the beginning of the second stage of India's nuclear programme.

Since it was first formally approved as a project by the government in 2003, the PFBR at Kalpakkam has taken over two decades to reach this stage.

**PFBR as a bridge**

India's nuclear reactors are heavily dependent on imported uranium. The country's three-stage programme, conceived in the 1950s, envisages being able to be independent of imported uranium, creating its own stockpile of suitable uranium, and eventually harnessing thorium, of which it has vast stores. The PFBR development serves as an essential bridge.

"This is a historic moment," Anil Kakodkar, Member, Atomic Energy Commission and former head of the Department of Atomic Energy, told *The Hindu*, adding, "What this means is that we are now on our way to extract 80-100 times more energy from a given quantity of uranium."

The PFBR is a 500 MW sodium-cooled, pool-type fast breeder reactor designed by the Indira Gandhi Centre for Atomic Research and built by Bharatiya Nabhikiya Vidyut Nigam Limited, both operating under the Department of Atomic Energy.

Prime Minister Narendra Modi witnesses initiation of core loading of indigenous prototype fast breeder reactor at Kalpakkam. PTI

**Uranium powerhouse**

India's pressurised heavy water reactors (PHWR) burn up uranium to produce electricity and small quantities of plutonium. However, less than 1% of the energy from this uranium (that can be used as heat and make electricity) is extracted from these reactors. The 'depleted' uranium in India isn't considered 'waste' but is reprocessed and stored. It, however, cannot be used back in the existing PHWRs.

"The PFBR reactor is designed to use the 'spent' uranium from the PHWR as well as produce more plutonium. We are no longer using fresh, mined uranium here. As a thumb rule, this means that the 1% energy extracted can go up to nearly 10% for a single cycle and for every additional cycle 10% more. The efficiency of the uranium that is mined goes up substantially, Ravi Grover, Member, Atomic Energy Commission, told *The Hindu*.

"The burn-up or the energy extracted goes from about 8,000 units (in a PHWR) to nearly 100,000 units," Mr. Grover said.

**Two more reactors**

India's current plan, Mr. Grover said, was to construct two more PFBR at Kalpakkam, though this would only be following a proper assessment of the performance of the PFBR for a year. In the current scheme of things, the PFBR will produce only "marginally more" plutonium.

"Our current priority is to use the uranium that we have far more efficiently. There is a reprocessing plant to come up on site at Kalpakkam which will use the processed spent fuel from the PFBR and for the two future PFBR. The PFBR will use depleted uranium (from the Pressurised Heavy Water Reactors or PHWRs).

In the future, we will use thorium, but that is still a long time away, and what kind of reactors we will use for that, we need more work and have to wait and watch," he said, adding, "These reactors are self-sustaining but as and when we need more plutonium in the future, the design has to be optimised to extract more plutonium."

Currently, India has a fleet of 18-20 PHWRs that use natural uranium as fuel and produce plutonium-239 (Pu-239) as a by-product in spent fuel. India's full fleet of 23 nuclear reactors have a combined capacity of 7.48 GW. India hopes to have 100 GW by 2047 and this is premised on a larger fleet of Bharat Small Modular Reactors (which are scaled down PHWR) that are in the pipeline.

A significant technological challenge that has led to delays in the PFBR is the use of liquid sodium as a coolant to manage the extremely high heat from fissioning uranium atoms in the PFBR. In India's current reactors, the heat is largely absorbed by 'heavy water', or in some cases, ordinary water. Once fully operational, the PFBR is expected to generate 500 MW of electricity, with a design life of 40 years.

### 1. Understanding the Significance of "Criticality"

In nuclear physics, criticality is the state where a nuclear reactor sustains a self-reliant chain reaction. This means that for every fission event, exactly one of the released neutrons goes on to cause another fission.

**Transition:** It marks the end of the "construction and fueling" phase and the beginning of the "operational" phase.

**Safety:** Achieving criticality under controlled conditions proves the reactor's design and safety mechanisms (like the liquid sodium coolant system) are functioning as intended.

### 2. The Bridge: India's Three-Stage Programme

Conceived by **Dr. Homi J. Bhabha**, this programme is designed to overcome India's limited uranium reserves and utilize its massive **thorium** deposits (about 25% of the world's total).

| Stage | Technology | Fuel Used | Key Function |
|---|---|---|---|
| **Stage 1** | **PHWRs** (Current) | Natural Uranium | Generates power + **Plutonium-239** (by-product) |
| **Stage 2** | **PFBR** (The Bridge) | Mixed Oxide (MOX) | **Breeds more fuel** (Pu-239) than it consumes. |
| **Stage 3** | **Thorium Reactors** | Thorium-232 / U-233 | Uses Thorium to provide centuries of energy. |

**3. Why the PFBR is a Technological Marvel**

The 500 MWe PFBR, built by **BHAVINI**, is unique for several reasons:

**"Breeder" Capability:** It uses a blanket of Uranium-238 (depleted uranium) around the core. Fast neutrons convert this "fertile" material into "fissile" Plutonium-239, effectively creating fuel while generating power.

**Liquid Sodium Coolant:** Unlike water-cooled reactors, it uses liquid sodium. Sodium has a high boiling point (approx. 880°C), allowing the reactor to operate at high temperatures without high pressure, increasing efficiency. However, it is highly reactive with air/water, requiring world-class engineering.

**Fuel Efficiency:** As noted by AEC members, this technology allows India to extract 80-100 times more energy from the same amount of uranium compared to traditional reactors.

**4. Strategic and Economic Impact**

**Energy Security:** Moves India closer to its target of 100 GW of nuclear power by 2047, reducing reliance on imported coal and uranium.

**Global Standing:** India is now only the second country (after Russia) to operate a commercial-scale Fast Breeder Reactor.

**Net Zero 2070:** Nuclear provides "base-load" power (unlike intermittent solar/wind), which is essential for decarbonizing the heavy industry.

**Conclusion**

The Kalpakkam PFBR is not just a power plant; it is a "bridge" to the Thorium Age. While it will take a few more months to reach full commercial power production, reaching criticality confirms that the complex "breeding" physics works. For India, this is the ultimate step toward becoming an energy-independent superpower.

## UPSC Prelims Exam Practice Question

**Ques: With reference to the Prototype Fast Breeder Reactor (PFBR), consider the following statements:**

1. It uses fast neutrons to sustain the chain reaction.

2. It produces more fissile material than it consumes.

3. It uses ordinary water as a coolant.

**Which of the statements given above is/are correct?**

(a) 1 and 2 only

(b) 2 and 3 only

(c) 1 only

(d) 1, 2 and 3

**Ans: a)**

## UPSC Mains Exam Practice Question

**Ques:** Explain the significance of achieving criticality in the Prototype Fast Breeder Reactor (PFBR) for India's nuclear energy programme. **(150 Words)**

solar-collecting satellites in orbit—typically Geostationary Earth Orbit (GEO)—where sunlight is roughly 10 times more intense than on Earth and available 24/7, regardless of weather or season. This energy is converted into microwaves and beamed down to a ground station (rectenna), which converts it back into electricity for the grid.

QUESTION CORNER

# Energy from space

**Q: What is space-based solar power?**

**A:** The Shimizu Corporation in Japan has proposed a belt of power plants sitting along the moon's equator, which is 11,000 km long, called the "Lunar Ring". According to the company's plans, robots can build this mega-structure from lunar soil. The facilities will collect solar energy from the sun and beam it to the earth as microwaves.

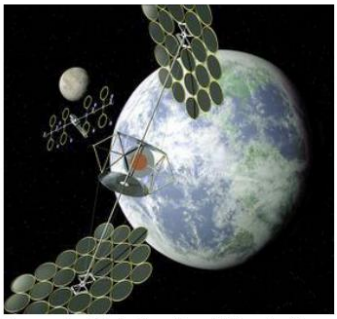
If space-based solar power sounds like science fiction, it is exactly that. The concept involves launching large arrays of satellites to collect sunlight 24/7, and beaming the energy to the earth as microwave radiation. The corporation's plans are slightly different — they involve facilities on the lunar surface rather than in earth orbit — but otherwise involve the same physics.

Unfortunately for supporters of the idea, there are daunting hurdles.

The cost of space-based solar is staggering. Even if rocket launch prices drop significantly, engineers must still transport thousands of tonnes of hardware into orbit (or the moon). Building a single functional power plant is an unprecedented logistical feat. Once operational, the system must beam power through the atmosphere, a process that will lose significant energy as heat.

In orbit, a single collision with space debris could cripple a billion-dollar array, turning it into junk. Maintenance will also be extremely expensive on the moon.

Terrestrial solar and battery storage are also getting cheaper and more efficient every year, making it hard to justify a complex and risky orbital or lunar facility. For now, space-based solar remains an idea trapped in poor economics.



A conceptual illustration of a satellite collecting solar energy in earth orbit and beaming it down as microwaves. NASA

**For feedback and suggestions** for 'Science', please write to **science@thehindu.co.in** with the subject 'Daily page'

**2026 Status Update: From Vision to Validation**

While the "Lunar Ring" mentioned in your snippet remains a long-term concept, several nations are moving toward orbital deployment:

**1. China's "Project Zhuri"**

China is currently the frontrunner. In early 2026, China reaffirmed its goal to launch a 1-kilometer-wide solar station by 2028. This facility is projected to eventually generate energy comparable to massive terrestrial oil reserves. They are currently testing modular assembly using advanced space robotics.

**2. UK's Space Energy Initiative (SEI)**

A February 2026 UK government report suggests that small-scale SBSP could be economically competitive by 2040. The UK is focusing on "de-risking" the technology through smaller proof-of-concept satellites that could provide power to the grid for 95.7% of the year.

**3. ESA's SOLARIS Initiative**

The European Space Agency (ESA) is finalizing feasibility studies in 2026. They are exploring a "mirrored" concept—using giant space mirrors to reflect sunlight down to existing solar farms on Earth during the night to boost their yield.

**4. Caltech's Breakthroughs**

In late 2024 and 2025, Caltech's Space Solar Power Project successfully demonstrated wireless power transfer in space using the MAPLE instrument. It proved that lightweight, flexible structures can survive launch and beam energy to a specific target.

**The "Three Hurdles" (SBSP vs. Terrestrial Solar)**

Despite the excitement, the "poor economics" mentioned in the article still pose a major challenge.

| Challenge | 2026 Context |
|---|---|
| **Launch Costs** | The viability of SBSP is now heavily tied to SpaceX's Starship. If launch costs drop to $500–$700 per kg, the economics start to favor space power. |
| **Energy Loss** | Converting solar → electricity → microwaves → electricity involves multiple steps where energy is lost as heat. Currently, only a fraction of the collected energy reaches the grid. |
| **Space Debris** | A 1km-wide array is a massive target. In 2026, "Space Traffic Management" is becoming as important as the solar technology itself to protect these billion-dollar assets. |

**Conclusion**

While terrestrial solar & battery storage is the "low-hanging fruit" for 2030 targets, SBSP is being viewed by major powers (India, China, UK, USA) as the ultimate "Base-Load" renewable source. It bypasses the intermittency of wind and ground-solar, potentially offering a "plug-and-play" energy solution for any location on Earth.

## UPSC Prelims Exam Practice Question

**Ques** : **The term "rectenna" in SBSP refers to:**

(a) A satellite antenna for communication

(b) A ground-based system converting microwaves into electricity

(c) A device for storing solar energy

(d) A cooling system in satellites

**Ans: b)**

## UPSC Mains Exam Practice Question

**Ques:** Explain the concept of Space-Based Solar Power (SBSP). How does it differ from terrestrial solar energy systems? **(150 Words)**

## Page 08 : GS II : Governance / Prelims Exam

Kerala consistently challenges the traditional economic theory that high social development requires advanced industrialization. By prioritizing public healthcare, universal education, and decentralized governance, the state has secured the top position in most Indian socio-economic rankings. The current analysis evaluates Kerala's performance across four critical pillars: Economy, Health, Education, and Infrastructure.

# Amid welfare pitch, Kerala ranks highest in most indicators

The growing economy has outperformed other States in social, educational, and health parameters

DATA POINT

Sambavi Parthasarathy
Nitika Francis

Kerala is set to hold its Legislative Assembly elections on April 9, and the results will be announced on May 3. The stage is set for a tight competition between the incumbent Left Democratic Front (LDF) and the United Democratic Front (UDF), with the NDA trying to make inroads into the State's Assembly constituencies this year.

The three competing political fronts have released election manifestos which bet heavily on welfare via pensions. An analysis of key indicators shows that Kerala fares better than most in several indicators spanning health, economy, and education.

**Table 1** shows Kerala's ranking among other States in select economic indicators and its actual value as per the latest year. Kerala has demonstrated solid economic growth over the past decade, and ranked seventh among 23 States in per capita net State domestic product.

Data shows that economic development permeates Kerala's rural population as well. The average daily wage rate in the State is ₹868, the highest among all States.

The State also ranks second among others in terms of Human Development Index (HDI), which takes health, education, and standard of living into account.

**Table 2** shows Kerala's rank across various health indicators. As per data from the National Family Health Survey for 2021-22, Kerala recorded an Infant Mortality Rate of 4.4, the lowest in India. The nationwide average was nearly eight times this figure, 35.2. Kerala also recorded the lowest Maternal Mortality Ratio in the country.

The State recorded low shares of women aged 15-19 who have begun childbearing. About 93% of surveyed women in Kerala also have access to hygienic methods of menstrual protection. When it comes to children, only about 78% of Kerala's child population have received all basic vaccinations, ranking 12th out of 29 States. However, it has the second-lowest share of children aged 0-5 years whose growth is stunted, closely following Sikkim.

Kerala is also a frontrunner when it comes to education-related indicators **(Table 3)**. The State ranks among the top-performing States for the Adjusted Net Enrolment Rate (ANER) in elementary education (%). This indicator, as per the World Bank, refers to the number of pupils of the school-age group for primary education, enrolled either in primary or secondary education as a share of the total population in that age group.

Similarly, the State's Gross enrolment ratio in higher secondary is higher than the all-India average of 57.6%. It is one of the top three States for this indicator. GER refers to total enrolment in a particular level of school education, regardless of age, as a share of the population of the official age group for a given level of school education.

With a ratio of 1.44, the State ranks first among 29 States on the Gender Parity Index in education (GPI). The indicator is the ratio of female to male students enrolled at a specific level of education.

The State is among the top-performing States for infrastructure indicators **(Table 4)**. As per data, the share of urban households living in kachha houses in the State is null, less than the country's average of 0.9%. It ranks second among 28 States with respect to Internet teledensity in rural areas.

But Kerala lagged a little behind on environment-related indicators. The State was among the top 10 States that generated high amounts of plastic waste per thousand population. It was also one of the top nine States in terms of per capita fossil fuel consumption.

*(With inputs from Devyanshi Bihani)*

## Report card

The data for the tables were sourced from the National Family Health Survey (2021-22) and the NITI Aayog SDG India Index (2023-24)

**TABLE 1:** Kerala's values and ranks in terms of Human Development Index and economic indicators

| Indicator | Kerala's value | Kerala's rank | India average | Top States/U.T.s |
|---|---|---|---|---|
| Human Development Index (2023) | 0.86 | 2 out of 29 | 0.732 | Goa (0.862), Kerala (0.86), Delhi (0.837) |
| Per Capita net domestic product (₹) | 3,08,338 | 7 out of 23 | 2,05,324 | Delhi (4,93,024), Telangana (3,87,623), Karnataka (3,80,906) |
| Average daily wage rates in rural areas (₹) | 868.7 | 1 out of 18 | 398 | Kerala (868.7), T.N. (573.2), Himachal Pradesh (516) |

**TABLE 2:** Kerala's values and ranks across various indicators related to health

| Indicator | Kerala's value | Kerala's rank (out of 29) | India average | Top States/U.T.s |
|---|---|---|---|---|
| Share of women aged 15-19 who have begun childbearing (%) | 2.4% | 1 | 6.8% | Uttarakhand (2.4%), Kerala (2.4%), Goa (2.7%) |
| Infant mortality rate | 4.4 | 1 | 35.2 | Kerala (4.4), Goa (5.6), Sikkim (11.2) |
| Share of population with unimproved sanitation facility (%) | 0.2% | 2 | 19.3% | Mizoram (0.1%), Kerala (0.2%), Sikkim (0.3%) |
| Share of children aged 0-5 years whose growth is stunted (%) | 23% | 2 | 36% | Sikkim (22%), Kerala (23%), Manipur (23%) |
| Share of children with all basic vaccinations | 78% | 12 | 77% | Odisha (91%), T.N. (89%), H.P. (89%) |
| Women using a hygienic method of menstrual protection (%) | 93.3% | 6 | 77.6% | T.N. (98.4%), Delhi (97.1%), Goa (96.8%) |
| Maternal Mortality Ratio (per 1,00,000 live births) | 19 | 1 | 97 | Kerala (19), Maharashtra (33), Telangana (43) |
| Households with at least one member covered by a health scheme (%) | 57.8% | 10 | 41% | Rajasthan (87.8%), A.P. (80.2%), Goa (73.1%) |

**TABLE 3:** Kerala's values and ranks across various indicators related to education

| Indicator | Kerala's value | Kerala's rank (out of 29) | India average | Top States/U.T.s |
|---|---|---|---|---|
| Share of women (aged 15-49) who have done no schooling (%) | 0.8% | 1 | 22.6% | Kerala (0.8%), Mizoram (5.3%), Goa (5.5%) |
| Share of men (aged 15-49) who have done no schooling (%) | 2.3% | 1 | 10.7% | Kerala (2.3%), Goa (3.2%), Mizoram (3.4%), |
| Drop out rate (%) | 5.5% | 6 | 12.6% | Manipur (1.3), H.P. (1.5), T.N. (4.5) |
| Adjusted Net Enrolment Rate (ANER) in elementary education (%) | 100% | 1 | 96.5% | Multiple States (100%) |
| Gross Enrolment Ratio (GER) in higher secondary (%) | 85% | 3 | 57.6% | Delhi (94.9%), H.P. (94.1%), Kerala (85%) |
| Gender Parity Index (GPI) for higher education | 1.44 | 1 | N/A | Kerala (1.44), H.P. (1.33), Nagaland (1.28) |

**TABLE 4:** Kerala's values and ranks across various indicators related to environment and infrastructure

| Indicator | Kerala's value | Kerala's rank | India average | Top States/U.T.s |
|---|---|---|---|---|
| Plastic waste generated per 1,000 population (tonnes/annum) | 3.39 | 10 out of 23 | 3.04 | Goa (18.93), Delhi (16.9), Telangana (12.57) |
| Per capita fossil fuel consumption (in kg.) | 191.61 | 9 out of 21 | 166.43 | Haryana (341.95), Gujarat (339.23), Himachal Pradesh (271.79) |
| Percentage of urban households living in kachha houses (%) | 0% | 1 out of 29 | 0.9% | Kerala (0%), Haryana (0.2%), Maharashtra (0.2%) |
| Internet subscribers per 100 population in rural areas | 160.19 | 2 out of 28 | 38.33 | Goa (174.98), Kerala (160.19), Sikkim (104.35) |

### Key Performance Indicators (KPIs)

**1. Economic Prosperity & Labor**

**Per Capita Income:** Ranked 7th out of 23 states, indicating a robust standard of living.

**Wage Rates:** The state boasts the highest average daily wage in India at ₹868. This high floor for labor costs is a double-edged sword: it reduces poverty but often leads to "capital flight" to neighboring states.

**HDI:** Ranked **2nd** nationally, reflecting a holistic approach to the standard of living.

**2. The Healthcare Benchmark**

Kerala's health statistics are comparable to those of middle-income European nations:

**Infant Mortality Rate (IMR):** At 4.4, it is nearly eight times better than the national average (35.2).

**Maternal Health:** Recorded the lowest Maternal Mortality Ratio (MMR) in India.

**Sanitation: 93%** of women have access to hygienic menstrual protection, a critical indicator of social awareness and dignity.

**The "Vaccination Gap":** Interestingly, the state ranks 12th in basic vaccinations (78%), suggesting a slight lag in immunization coverage compared to its other stellar health feats.

**3. Educational Excellence**

**Gender Parity Index (GPI):** Ranked 1st with a ratio of 1.44, meaning more females are enrolled in education than males—a significant outlier in the Indian context.

**Net Enrolment:** One of the top performers in elementary and higher secondary education, significantly outperforming the national Gross Enrolment Ratio (GER).

**4. Infrastructure & Connectivity**

**Housing:** Urban "Kachha" houses are virtually non-existent (0%), reflecting the success of state-led housing schemes like LIFE Mission.

**Digital Divide:** Ranked **2nd** in rural internet teledensity, bridging the gap between urban and rural information access.

**The Challenges: Environment & Sustainability**

Despite social success, the report identifies two "Red Zones":

**Plastic Waste:** Ranked among the top 10 waste generators, indicating a struggle with consumption-led waste management.

**Carbon Footprint:** Among the top 9 states in per capita fossil fuel consumption, driven by high private vehicle ownership and energy-intensive lifestyles.

**Conclusion**

The "Kerala Model" serves as a case study in inclusive growth. The data confirms that Kerala has successfully translated its high literacy and political consciousness into tangible health and infrastructure outcomes. However, as the 2026 elections approach, the focus is shifting toward sustainability and fiscal management. While "welfare via pensions" is a popular electoral pitch, the state's future challenge lies in balancing its high-expenditure social model with environmental conservation and new-age industrial investment.

## UPSC Prelims Exam Practice Question

**Ques: Which of the following best explains the paradox of the Kerala Model?**

(a) High economic growth but low human development

(b) High human development despite low industrialization

(c) Low literacy with high income

(d) High industrialization with poor health outcomes

**Ans: b)**

## UPSC Mains Exam Practice Question

**Ques:** Discuss the key pillars of Kerala's socio-economic success—health, education, and decentralization. How far is it replicable in other Indian states? **(150 Words)**

## Page : 09 : GS III : Environment / Prelims Exam

The update to India's Nationally Determined Contributions (NDCs) in March 2026 marks a strategic recalibration of the country's climate strategy. As India moves toward its 2070 Net-Zero goal, the revised targets for the 2031–2035 period emphasize "strategic patience"—balancing aggressive green energy expansion with the unavoidable realities of a developing economy.

# On India's updated climate pledges

India's announcement of its revised Nationally Determined Contributions (NDCs) to the Paris Agreement prompts scrutiny of its existing climate mitigation actions and the need to factor in the country's developmental costs alongside those of meeting its climate commitments

FULL CONTEXT

T. Jayaraman

India's announcement of its revised Nationally Determined Contributions (NDCs) to the Paris Agreement – the term applied to the mitigation and other climate action targets that countries voluntarily commit to under the agreement – represents a considered step forward when India's energy and development policies are encountering serious headwinds. It is clear that the government has opted for continuity and incremental advance with respect to India's earlier NDCs. It is also clearly confident that its commitments will nevertheless be more than adequate in relation to its equitable share of global climate action, in keeping with climate justice and within its expected commitments as a developing nation.

**Three climate goals**

As the press communique after the Cabinet approval of the updated NDCs noted, there are three specific enhancements that have been committed. The first is an increase in the reduction of emissions intensity of its GDP, from 45% below 2005 levels by 2030 to 47% below 2005 levels by 2035. The second is ensuring that 60% of installed capacity for power generation is from non-fossil fuel sources, while the third is the enhancement of forest and tree cover carbon sinks to 2.5 - 4 billion tonnes of carbon dioxide equivalent above 2005 levels.

India's climate policies are best understood in the context of its structural constraints as a lower middle income developing country, that determine its available choices for climate action. Over the last three decades, these constraints have not substantially changed, which is also why India continues to insist on the relevance of the United Nations Framework Convention on Climate Change (UNFCCC). But apart from these, given the structure of the Paris Agreement that requires renewed and enhanced commitments to climate mitigation every five years, short-term considerations have also begun to have a considerable weight in the formulation of the NDCs. The rapid deterioration of the global environment for climate action over the last year has undoubtedly brought this issue to the fore.

**Enthusiasm for climate action**

Structural constraints have not, however, dampened enthusiasm for climate action in India, both at the level of the Centre and the State governments. There is a considerable range of activities designed to set India on the path to low-carbon development, drawing significant public and private sector efforts and resources, including electric vehicles, enhancement of energy efficiency, promotion and deployment of non-fossil fuel sources of electricity generation, new technologies such as green hydrogen and more recently, the active promotion of carbon capture and storage efforts.

But given India's developmental levels today, it is clearly premature for India to convert all such efforts into the significantly more onerous and accountable commitments that are the NDCs, the progress towards which is to be reported every two years in the Biennial Transparency Report (BTR) to the UNFCCC.

A section of global and domestic public opinion has raised the issue of the adequacy of India's NDCs relative to a global temperature goal of 1.5 degree warming above pre-industrial levels (the more ambitious part of the Paris Agreement's goals). Some have downplayed the new targets, one commentator going so far as to call it "a walk in the park". Others call for increased generation from renewables as the metric and not installed capacity. Even some sections of opinion that have welcomed the NDCs, appear nevertheless to be uncertain on whether these new commitments are genuinely the best that India can make at this time.

**The cost of going green**

All the above variants of the "India can (must) do more argument" ignore some critical realities that contextualise India's climate actions. Given that India's natural energy source is overwhelmingly coal, it is inaccurate to view improvements in emissions efficiency of GDP and the corresponding bending of its emissions trajectory as a "natural" corollary of India's growth story. Priority to electricity from renewable sources comes with significant costs, including backing down readily available and often cheaper or comparably priced coal-based thermal power, further tilting a playing field that privileges renewable energy to sustain our climate commitments.

Renewable energy (RE) projects including utility scale battery storage have begun to make their appearance in India's power sector. But the corresponding scaling up of India's battery storage capacity required for ensuring the stability of generation even from the proposed 2030 RE targets will run into a few trillion rupees at least. Part of such expansion would have to be funded by the government, deploying resources that would have been utilised in other sectors. At the very least, the deployment of such large-scale battery systems is not immediately feasible. The most globally widespread option of energy storage in reverse pumped hydropower systems, has very limited scope in India at present. Additionally, environmental concerns, and water needs for competing uses such as irrigation, as well as the regulatory challenges faced by all large hydro projects are likely to preclude any rapid expansion.

Optimistic RE projections, not only in India but even globally, have run into the lack of transmission capacity and the challenges of grid balancing, with the associated costs often omitted when referring to the cost-effectiveness of RE power.

Since, for India, coal is the mainstay of power generation when solar and wind cease, unlike the large-scale gas and hydro available elsewhere, the full utilisation of the available RE capacity will inevitably have to be "curtailed", while adding to the operation and maintenance costs for thermal power operated in this cyclical fashion. These add further to the true cost that India bears for the pursuit of its climate commitments.

Improving energy efficiency in other sectors is also being pursued vigorously, including the introduction of mandatory emissions intensity targets in key industries. The early ramp up of electric vehicles, while the jump from BSIV to BSVI vehicle emissions standards was just coming into place, was another leap frog moment, whose cost to the economy must not be underestimated. Since the 26th Conference of Parties of the United Nations Framework on Climate Change at Glasgow, every Central government budget has seen a range of initiatives and resource commitment across various aspects of climate mitigation. Indeed, a major knowledge gap today is that while future costs of increased mitigation action are routinely calculated, the cost burden attached to India's mitigation initiatives undertaken so far, in the absence of any significant climate finance, have yet to be estimated in a reliable manner.

**Accounting for India's developmental future**

At a more over-arching level, India's mitigation challenge cannot be based on a simple extrapolation of the current structural features and trends of its economy.

India's developmental future needs room for further large-scale growth in manufacturing and industry, expansion in the provision of goods and services to its population at adequate levels beyond the minimum, and an urban transition that has only just begun. In this context, the "India can do more" arguments that rely on such extrapolation of economic trends and the persistence of current structural features, miss the urgent need to hedge India's developmental future.

India cannot commit its NDCs to preserving the Paris Agreement goal of limiting global temperature increase to 1.5 degrees above pre-industrial levels, when the goal is rapidly slipping out of reach. This a trend that India cannot reverse, given that its per capita emissions are a third of the global average. Even otherwise, under the voluntary emissions reduction NDCs of the Paris Agreement, the benefits of India's reduction in emissions below any business-as-usual baseline, are distributed primarily to the big emitters globally, due to their inadequate efforts, and proportionately less to India, especially when the largest historical emitter has walked out of all climate treaties and seeks to dismantle climate action both at home and abroad

India's climate commitments have to be strategic and circumspect, while its NDCs are formulated in informed self-awareness of its, to use the language of the Paris Agreement, "national circumstances."

*(T. Jayaraman is with the National Institute of Advanced Studies, Bengaluru. Views expressed are personal.)*

THE GIST

- India's climate policies are best understood in the context of its structural constraints as a lower middle-income developing country, which shape its choices for climate action.
- The country has implemented several decarbonisation initiatives, including electric vehicles, deployment of non-fossil fuel power sources, and technologies such as green hydrogen.
- However, India needs room for further large-scale growth in manufacturing and industry, which must be factored in alongside the future costs of its climate commitments.

A drone view of solar panels and the NTPC (National Thermal Power Corporation) power plant in Solapur, Maharashtra. REUTERS

## I. The Core Pillars of the 2035 Updated NDCs

The Union Cabinet recently approved three primary enhancements to India's climate commitments, shifting the focus from 2030 to a 2035 timeline:

**Emissions Intensity Reduction:** India now aims to reduce the emissions intensity of its GDP by 47% by 2035 (compared to 2005 levels). This is an incremental increase from the previous 45% target set for 2030.

**Non-Fossil Fuel Capacity:** The target for non-fossil fuel-based installed electricity capacity has been raised to 60% by 2035.

Current Context: As of February 2026, India has already crossed the 52% mark, reaching its original 2030 goal (50%) nearly five years early.

**Carbon Sink Expansion:** India is committed to creating an additional carbon sink of 3.5 to 4 billion tonnes of $CO_2$ equivalent through enhanced forest and tree cover by 2035.

**II. The "Development vs. Climate" Dilemma**

Expert analysis, such as that by T. Jayaraman (NIAS), underscores that India's climate policy is not just about environment—it's about national survival.

**1. The Cost of Battery Storage**

To make a 60% renewable grid stable, India requires massive Battery Energy Storage Systems (BESS). Current estimates suggest this will cost trillions of rupees. Without significant international climate finance, these funds must be diverted from other critical sectors like education or healthcare.

**2. The "Baseload" Reality**

While solar and wind capacity are growing, they only contribute about 22–25% of actual generation because they are intermittent. Coal remains the "mainstay" because India lacks the massive natural gas reserves or high-capacity pumped-hydro storage seen in other nations.

**3. Hedging the Future**

India's urban transition and manufacturing growth (e.g., Make in India) are just beginning. Absolute emission cuts (rather than intensity cuts) would "freeze" India's development. Therefore, India continues to advocate for Climate Justice, reminding the world that its per capita emissions remain a third of the global average.

**III. Summary**

| Feature | Details for Mains/Prelims |
|---|---|
| **Philosophy** | Panchamrit (Five nectar elements) & LiFE (Lifestyle for Environment). |
| **Metric** | Intensity-based (Emissions per unit of GDP) rather than absolute cuts. |
| **Achievements** | Met the 2030 non-fossil capacity goal (50%) in 2025. |
| **New 2035 Target** | 47% Intensity reduction; 60% Non-fossil capacity; 4bn tonne Carbon Sink. |
| **Key Constraints** | High cost of grid balancing, lack of climate finance, and the "locked-in" nature of coal infrastructure. |

**Conclusion**

India's updated NDCs are a "considered step forward," avoiding the trap of over-committing to absolute reductions that could stifle its Viksit Bharat 2047 goals. By focusing on emissions intensity and installed capacity, India maintains its status as a responsible global actor while shielding its economy from the "onerous and accountable" constraints that a premature shift to absolute targets would entail.

## UPSC Prelims Exam Practice Question

**Ques: Which of the following are part of India's climate strategy?**

1. Panchamrit

2. LiFE (Lifestyle for Environment)

3. Carbon Border Adjustment Mechanism

**Select the correct answer:**

(a) 1 and 2 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

**Ans: a)**

## UPSC Mains Exam Practice Question

**Ques:** Discuss the key features of India's updated Nationally Determined Contributions (NDCs) for 2035. How do they reflect a balance between development and climate responsibility? **(250 Words)**

# Delimitation, women's reservation, political dynamics

**Zoya Hasan**

Professor Emerita, Centre for Political Studies, Jawaharlal Nehru University

In September 2023, Parliament passed the Constitution (One Hundred and Sixth Amendment) Act, 2023, or the Nari Shakti Vandan Adhiniyam, which commits to reserving one-third of seats in the Lok Sabha and Vidhan Sabhas for women, including in constituencies already earmarked for Scheduled Castes and Scheduled Tribes. However, this potentially transformative measure falls short of immediacy: its implementation is deferred until after the next Census and the subsequent delimitation exercise.

During parliamentary debates, the Congress party, along with several other Opposition parties, demanded its immediate operationalisation, ideally for the 2024 general election. Women's rights groups criticised the government for tying the quota to delimitation after the new Census, arguing that it creates unnecessary delays. The National Democratic Alliance (NDA) government rejected this, maintaining that such a major change, without updated Census data and delimitation, would undermine both fairness and feasibility.

**The shift now seems more deliberate**

Less than three years later, that position appears to have shifted. Recent reports suggest that the government now plans to amend the Women's Reservation Act, 2023 by initiating a delimitation exercise based on the 2011 Census, rather than waiting for a fresh Census and a subsequent delimitation process tied to it. At the same time, the size of the Lok Sabha and State Assemblies may be expanded by nearly 50%, increasing the Lok Sabha's strength from 543 to 816 seats. In the absence of any formal articulation of the basis for such an expansion, questions arise about its implications for representational balance and political fairness.

Taken together, these developments – particularly the proposed increase in seats – point to a decoupling of women's reservation from the next Census, expected to include caste enumeration beyond the Scheduled Castes and Scheduled Tribes, and the delimitation exercise that would follow. While this shift is framed as a means of expediting implementation, it also suggests a more deliberate political reconfiguration underlying these far-reaching structural changes.

The timing is telling. Acting at this juncture allows the government to claim credit for a long-pending reform that previous administrations failed to implement, even if it entails departing from the sequencing that it had earlier defended. It has clear electoral implications, likely to mobilise women voters in upcoming Assembly elections across key States/Union Territory, consolidate support ahead of the 2027 contests, and position the Bharatiya Janata Party as the party that delivered on women's reservations and gender justice. This claim could, in turn, become a chief plank of its campaign for the 2029 general election.

Implementing women's reservation without waiting for the Census or delimitation exercise could undermine representation and the intended reforms

Delimitation, however, remains contentious, questioning whether representation should be based solely on population or also consider economic, social, and demographic factors. A strictly population-based approach would strengthen the parliamentary power of northern States where fertility rates remain relatively high, while reducing the relative influence of southern and peninsular states that have stabilised population growth and significantly drive India's economy and employment. This dynamic is likely to deepen the existing north-south divide, driven by demographic asymmetries and uneven development outcomes, placing additional strain on the federal compact and the balance of inter=State representation.

These conflicting concerns stem from the constitutional freeze on delimitation, leaving constituency boundaries and seat allocations unchanged since the early 1970s. After nearly five decades, the government now appears set to lift this freeze, proposing a roughly 50% expansion of the Lok Sabha alongside proportional increases in State Assemblies. This approach is intended to reassure southern States by preserving their relative share of seats and thus reducing resistance to delimitation. Yet, even with a uniform expansion, the absolute seat counts of northern States would rise significantly, further tilting the existing balance of power in their favour. For instance, Uttar Pradesh and Bihar together could approach 180 seats, while the five southern States (Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Telangana) combined may reach around 195, raising the possibility that the northern bloc could still wield disproportionate political weight. In a first-past-the-post system, where numerical strength ultimately determines both electoral victory and seats gained, such an increase risks entrenching structural disadvantages for less populous regions, even if formal proportionality is preserved.

**The issue of data**

These distributional concerns are compounded by the question of data. Basing women's reservation on the 2011 Census is problematic, particularly when a new Census is already underway. India in 2026 bears little resemblance to its 2011 demographic profile: migration, rapid urbanisation, and the after-effects of the COVID-19 pandemic have significantly reshaped population patterns over the past decade and a half, altering both urban and rural constituencies. Proceeding with outdated data risks misrepresenting current realities at the very moment when foundational decisions on delimitation, seat expansion, and the operationalisation of women's reservation are being made. Yet, the urgency to move ahead suggests a calculated political judgement: that the imperative of delivering women's reservation will outweigh resistance, as few can afford to oppose its expeditious implementation, leaving little room to contest either the process or its sequencing. The issue is further complicated by what the next Census itself may reveal. Widely expected to be a landmark exercise, the availability of caste data could sharpen demands for greater representation of disadvantaged caste groups, particularly given their demographic strength. It may also amplify calls for sub-quotas within women's reservation, especially from Other Backward Classes (OBCs), including Muslim OBC communities that remain underrepresented. Several political parties and women's organisations have already voiced such demands. By moving ahead without waiting for the 2026-27 Census, the government appears to be postponing these pressures, but only temporarily.

A further concern is the lack of clarity on how women's reservation will operate in practice. While the amendment mandates a one-third quota, it defers critical details, especially the rotation of reserved constituencies. This is not a minor issue: rotation determines who can contest, from where, and with what continuity, shaping both accountability and constituency development. Earlier proposals cautioned that frequent rotation could disrupt these goals, yet the current framework leaves the design unresolved. Reports suggest that in smaller States and Union Territories with one or two Lok Sabha seats, the rotation of reserved constituencies may operate differently, resulting in less frequent turnover, while in larger States, some seats could remain reserved across successive terms. However, the law itself provides only for rotation after delimitation, leaving the precise mechanism to be defined.

**The need for deliberation**

None of this diminishes the core premise: women's reservation is long overdue and politically imperative. Evidence from other countries suggests that quotas can be effective, and there is little reason to believe that India would be an exception. Taken together, women's reservation, seat expansion and delimitation are not isolated changes; they will jointly reshape who is represented, from where, and in what proportions. Seen in this context, they mark a foundational reordering of the electoral map – one that will redraw constituencies, recalibrate the weight of States, and reconfigure the social composition of legislative bodies. Far from a marginal or technical adjustment, this is a structural shift that could rebalance political power across regions, social groups, and genders.

Precisely because of the scale of this shift, implementation must be preceded by thorough deliberation grounded in the latest data. Departing from the logical and constitutionally settled sequence risks distorting representation and seat distribution, thereby weakening the very reform it seeks to advance. India stands on the cusp of one of the most significant transformations of its representative system since the early decades of the Republic.

**GS Paper II: Social Justice**

**UPSC Mains Exam Practice Question:** Discuss the key features of the Women's Reservation Act (2023). What are the challenges associated with its implementation? **(150 Words)**

**Context :** This analysis explores the complex intersection of the Women's Reservation Act (Nari Shakti Vandan Adhiniyam), the upcoming Delimitation exercise, and the broader Political Dynamics of India as of April 2026.

The current discourse suggests a major shift in the government's strategy: decoupling women's reservation from the fresh Census to expedite its implementation, while simultaneously proposing a massive expansion of the legislature.

**I. The Core Transformation: Women's Reservation**

The 106th Constitutional Amendment Act, 2023, mandates a 33% reservation for women in the Lok Sabha and State Legislative Assemblies.

- **The Original Clause:** Implementation was initially tied to the completion of the first Census conducted after the Act's commencement and the subsequent delimitation.
- **The 2026 Shift:** Reports now indicate the government may use 2011 Census data to initiate delimitation specifically for women's quotas. This allows for implementation before the 2029 General Elections, bypassing the delays of the ongoing 2026-27 Census.
- **Impact:** This moves "gender justice" to the forefront of the political agenda, though critics argue that using 15-year-old data fails to account for massive shifts in migration and urbanization.

**II. The Delimitation Dilemma & Seat Expansion**

Delimitation is the process of redrawing boundaries of representative seats based on recent population data. Since 1976, seat allocations have been frozen to prevent states with successful population control (mostly Southern) from losing political power.

**The "50% Expansion" Proposal**

To mitigate the "North-South" divide, the government is considering expanding the Lok Sabha from 543 to 816 seats.

- **The Logic:** By increasing the total pool of seats, the government hopes to ensure that Southern states do not see an absolute reduction in their number of MPs, even if their relative share of power decreases compared to high-growth Northern states.
- **The Resulting Power Shift:** Even with expansion, the "Hindi Heartland" (UP, Bihar, MP, Rajasthan) would see a massive surge in absolute numbers. For instance, Uttar Pradesh and Bihar could potentially control nearly 180 seats, creating a formidable political bloc.

**III. Key Political & Structural Challenges**

| Challenge | Description |
|---|---|
| Data Accuracy | Using 2011 data in 2026/2027 ignores the demographic impact of the COVID-19 pandemic and the rapid growth of "Tier-2" cities. |
| Federal Compact | Southern and Western states argue that being "penalized" for successful family planning and economic contribution weakens the federal spirit. |
| The OBC Sub-Quota | Opposition parties and several women's groups continue to demand "quota within quota" for Other Backward Classes (OBCs) and minorities, which the current Act does not provide. |

| Challenge | Description |
|---|---|
| Rotation of Seats | The mechanism for which seats are reserved and how they "rotate" every term remains undefined, leading to concerns about candidate continuity and accountability. |

**IV. Constitutional & Analytical Points**

**Article 82 & 170:** These articles govern the delimitation of constituencies for Lok Sabha and State Assemblies. The 84th Amendment (2001) extended the freeze on seat allocation until the first census after 2026.

**Representational Balance:** The tension lies between the principle of "One Person, One Vote" (proportionality) and the principle of Federalism (protecting states that follow national policy goals).

**Gender Parity vs. Caste Equity:** The debate over the next Census including caste enumeration is crucial. If the Census reveals a higher OBC population, the demand for sub-quotas in the Nari Shakti Vandan Adhiniyam will likely intensify.

**Conclusion**

India is at a foundational crossroads. While the operationalization of women's reservation is a landmark achievement for gender justice, its linkage with delimitation and seat expansion reorders the very map of Indian democracy. The decision to move ahead without waiting for the latest Census results reflects a "political judgment" of urgency, but it risks leaving deep-seated regional and social grievances unaddressed.

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