



Learn Beyond

# SC questions ED's claim of rule of law breach in Bengal

**Krishnadas Rajagopal**

NEW DELHI

The Supreme Court on Thursday asked whether the Directorate of Enforcement (ED) was making a case of “breakdown of constitutional machinery” in West Bengal, momentarily pausing the Central agency’s rejoinder against Chief Minister Mamata Banerjee, senior State police officers, and bureaucrats for allegedly violating the rule of law to “barge” into the I-PAC premises in Kolkata during a raid and leaving with material said to be incriminating in a coal smuggling case.

“We hope you are not arguing ‘breakdown of constitutional machinery’ in the context of the controversy you are raising,” Justice N.V. Anjaria, a member of the Division Bench headed by Justice Prashant Kumar Mishra, asked Solicitor-General Tushar Mehta, appearing for the ED.

The failure of constitutional machinery is a ground to impose President’s Rule in a State un-



This is a law and order issue... State governments, including the States of West Bengal and Tamil Nadu, have repeatedly approached the Supreme Court under Article 32, and been entertained by this court

**TUSHAR MEHTA**  
Solicitor-General



der Article 356 of the Constitution. The query from the Bench followed submissions from the ED about a “well-established pattern” of violations by the Chief Minister, the State police, and the ruling Trinamool Congress, and a “non-existent” rule of law over the years in West Bengal.

### Incidents recalled

Mr. Mehta referred to the police “siege” of the Central Bureau of Investigation (CBI) Joint Director’s residence in Kolkata and the arrest of CBI officials in 2019, a “mob” of lawyers and party workers crowding into a Calcutta High Court courtroom on January 9, 2026, and the Director-General of Police “act-

ing as the PSO (personal security officer) of the Chief Minister”.

Mr. Mehta responded that there was “nothing up the sleeve” of the ED in the case. He said the “rule of law” was a “part and parcel”, an essential part of Article 14, of the Constitution. The ED officials, against whom the State police registered criminal cases for conducting what was described as a lawful investigation, have a fundamental right to equality before the law or equal protection of the laws. “The ED cannot argue ‘breakdown of constitutional machinery’ [Article 356],” Mr. Mehta said.

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## GS Paper II – Governance

### Has a weakening of unionisation hurt workers?



**Kingshuk Sarkar**  
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#### PARLEY

Since March, the country has witnessed a number of agitations by workers, particularly by those in the manufacturing sector. In the background of these protests for minimum wages; expansion of the social security ambit; and against the contractualisation of jobs, the role of trade unions have come up for discussion. There have been concerns about the impact of deunionisation and how it has affected the workers. Kingshuk Sarkar and Fredy K. Thazhath discuss the question in a conversation moderated by A. M. Jigeeesh.

#### What is the extent of the deunionisation among Indian workers?

**Kingshuk Sarkar:** Amidst the shifting global, political and economic landscape, the nature of the Indian labour movement, particularly the trade union movement, has undergone substantial changes over the last four decades. Before 1991, unions had relatively better bargaining power, mainly in the public sector. Post-liberalisation, mainstream trade unions gradually suffered from declining bargaining power as the labour market became predominantly informal, in the sense that these workers lack employment contracts or do not have access to institutional social security.

Mainstream trade unions suffered from fragmentation and ideological divisions and this weakened trade union effectiveness. Trade unions mostly focused on the regular permanent workforce; and their penetration among the growing segment of contract workers was not high. Global competition and the weakening of regulatory regimes led to the deterioration in labour standards and wages. Secure, well-paid jobs have declined, replaced by flexible work arrangements and non-standard employment, including part-time, short-time, and self-employment. Also, younger workers have a negative perception about trade unions. Today, the unionisation rate among the workforce is only 6.3% – 1.8% in the private sector and 11.8% in the public sector. The recent enactment of the Labour Code is going to further aggravate the situation.

**Fredy K. Thazhath:** Challenges to the trade union movement have happened not just because of empirical adversities. It's because of the sharpening of the general crisis of capitalism and the resulting drive for fetishistic methods of outsourcing and fragmentation of industries. Unlike in many other capitalist countries, it was the working class that fanned the fire of the Indian freedom struggle. The working class



**Living on the edge:** Police officers patrol a street after workers demanded a wage hike, amid soaring prices, in Noida, Uttar Pradesh, on April 13. REUTERS

fought colonial rulers compelling them to make labour laws. When the republic was born, the fruits of those labour laws were reaped by the workers for the first two to three decades, called the dirigisme period. The public sector grew. But after the Liberalisation, Privatisation and Globalisation (LPG) policies came in 1991, this was not the case. There has been a counter offensive from the side of capital, especially from finance capital and its adjuncts. It is not that contract labour grew because of the timidity of the existing trade union movement, it is because of the impact of a general onslaught upon the working class, and because of the privatisation of public sector units, which led to those sections of the working class getting trimmed off, lessening its bargaining power. So it is a phenomena-based outcome, not just a behavioural outcome.

#### Forming a trade union is a fundamental right, but they are often seen as a "problem". What has been the Indian experience?

**KS:** The growth of Indian trade unions and political developments are very closely related. Since 1991, we have seen a lot of outsourcing happening. A person may be working for an organised sector, but many do not have a direct relation with the employer. So sometimes it becomes difficult for trade unions to engage or mobilise workers as union members. Also, because of the political affiliations of mainstream trade unions, there have been misgivings among the workers as they see trade unions as an extension of the political ideology. In the public sector, employment decreased from 19.6 million in 1991 to 17.5 million in 2008. Economic reforms lead to the closure or downsizing of uncompetitive public sector units and traditional industries.

**FKT:** In regions such as Kerala and Tamil Nadu,



Mainstream trade unions suffered from fragmentation and ideological divisions and this weakened trade union effectiveness. Trade unions mostly focused on the regular permanent workforce; and their penetration among the growing segment of contract workers was not high

**KINGSHUK SARKAR**

when general strikes occur, contract unions are a part of it. The contracted workers are also unionised as separate entities. Even with this kind of an arrangement, the general drive was for the abolition of contractualisation. Now, because of LPG policies and the diminishing democratic atmosphere in the country – unlike in the days of the freedom struggle, when the working class struggle and the democratic struggle to overthrow imperialism went hand in hand – things have gotten worse. After Independence, the general democratic movement among the people helped to galvanise the worker-peasant alliance. It was not simply the legislative or statute part of trade union rights that helped the movement. But now because of the general onslaught, the working class movement has begun to fight defensively. The question of abolishing contractualisation and the question of making a living wage have gone behind the question of manifesting a minimum wage.

#### The present crisis is around a minimum wage for workers and increasing prices. Have the presence of trade unions helped the government and industries to amicably address these problems?

**FKT:** When trade union leaders are in house arrest, there is no furor in Parliament or Assemblies. There are no headlines in major newspapers. This is a kind of de-democratisation. A trade union is an agency within the capitalist system. It is not a revolutionary movement. So even though it is within the system, it is curtailed and not at all talked about. And this is because of the political and economic perspective of LPG policies.

**KS:** The apparent reason behind this unrest in the national capital region is that the minimum wage was not enough for subsistence. State governments decide the minimum wage, determined by a minimum wage advisory board. It is a tripartite, equally represented committee, with representatives from the trade union, the employers and the government. So trade unions have a role to play in the revision of minimum

wages. They should be more vocal within this tripartite labour administrative structure so that the voices of workers are raised and States are compelled to revise minimum wages.

Another issue is that labour market dynamics are creating more problems for trade unions because we have so much of surplus labour coming out of agriculture. Agriculture provides only 14% of the national income, but the employment share of agriculture is more than 45%. This labour needs to be meaningfully employed in the industrial and tertiary sector, which is not happening.

#### The implementation of the four Labour Codes is being projected as a solution. What do you think is the way forward for addressing the problems of workers?

**KS:** The Labour Codes do not favour the workers, it is in some cases favouring the employers. However, it is not a huge change from the laws that we already had. Under the labour laws, minimum wages become more progressive because minimum wage has been added to all employments.

However, in the last 40 years, whatever that has been already mentioned in the labour laws have not been implemented. Rather than formalising the informal, our labour force has become more informal over the years in spite of a protective labour law framework being there. So I think the situations are different but we should go back to the basics. Whatever that is there for the workers should be implemented.

**FKT:** It is a fight for survival. In the last three decades, apart from defensive general strikes, nobody can cite sector-wise indefinite strikes or floor level strikes with aggressive demands. Now, it is evident from the Labour Codes that the capitalists are not happy with even contractualisation. The state, and the oligarchy corporates are going for 'fixed term employment'. This is a phenomena-based situation, because of which phenomena-based outbreaks happens.

Under the Labour Codes, trade unions cannot be formed without 10% of the workforce; unlike in the earlier case of eight workers coming together and forming a trade union. There is no statutory supervision by the Labour Department at all. This is a catastrophic phenomena-based outcome, and not a behavioural issue of existing trade unions.



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## GS Paper II – Social Issue

# What are safer fireworks alternatives?

How loud do fireworks at Thirissur Pooram get? What do India's noise rules permit? What risks do fireworks pose to hospitals? What is cold spark technology? Are they safer than traditional fireworks? Why are noiseless alternatives not widely used yet? What transition is being proposed for Thirissur Pooram?

### EXPLAINER

Divya Gandhi

#### The story so far:

**A**s hundreds gathered to experience the grand fireworks display at the Thirissur Pooram festival in Kerala last year, a heavily caparisoned and disoriented elephant, Uttoyy Raman, suddenly ran amok, leaving 42 people injured. The previous day, another parading elephant, Chirakkara Sreeraman, had attacked its mahout. "Elephants, like other animals, get disoriented not just by decibel levels, but also by the structure and frequency of noise," said Manjari Jain, Associate Professor, Department of Biological Sciences, IISER Mohali. In response to an RTI request filed by *The Hindu*, the Kerala State Pollution Control Board stated that noise levels during the 2025 festival peaked at as much as 122.4 decibels in one area. This was just under the Central Pollution Control Board's 'Noise Standards for Firecrackers', which prohibit "the manufacture, sale or use of fire-crackers generating noise level exceeding 125 [decibels]... at 4 metres distance from the point of bursting."

#### What are the risks to hospitals?

As for permissible ambient noise levels, the National Ambient Noise Monitoring Network recommends 45-55 decibels in residential areas and 40-50 decibels in "silence zones" such as hospitals and educational institutions – far lower than the legal cap of 125 decibels for fireworks. Eminent social scientist Rajan Gurukkal has raised concerns about the proximity of Thirissur's fireworks to hospitals, especially those with neonatal intensive care units, and their impact on infant brain development. "The way the



Firefighters douse a blaze at a fireworks unit in Mundathikode, Thirissur, Kerala on April 21. PTI

festival is conducted in Thirissur violates ICU norms. Many facilities do not have soundproof windows, and the district hospital is minutes away from the fireworks," he told *The Hindu*. The World Health Organization notes that noise pollution is the third most hazardous environmental threat to human health, after air and water pollution.

#### What are the noiseless alternatives?

"It is time to go noiseless," said Professor Gurukkal, on April 21, when 13 people were killed and 40 injured in a blaze at a fireworks manufacturing unit in Mundathikode near Thirissur. "We do not need to reinvent the wheel, cold spark technology is available, but not yet scaled up."

This technology, unlike traditional fireworks, uses a chemical combustion reaction of very fine granulated metal

alloy powders of titanium and zirconium, explained Samrat Ghosh, Assistant Professor at the Frugal Innovation Lab for Societal Benefit, Department of Chemical Sciences.

The 'cold sparkular', for instance, is a gun-like device equipped with a heater and a fan. The heater warms the fine alloy powder to increase its activation energy, while the fan blows the fine granulated metal alloy powders out. "When these fine powders eject out of the barrel of the hand-held gun, the heated fine powder reacts with the oxygen in the air and undergoes a rapid exothermic reaction that emits light with a sparkler-like effect as seen in traditional fireworks – but with no noise," Dr. Ghosh explained.

They can prevent burn injuries. While traditional sparklers emit temperatures of around 1,200 °C, cold sparkulars and cold anars operate at 60-100 °C, he added.

Though already available commercially online, these pyrotechnics remain expensive – a single 'cold anar' can cost around ₹400 – and are largely manufactured in China. "We have plenty of scope in India as the technology is well known and one can indigenously make these nano-powders," Dr. Ghosh said.

Prof. Gurukkal emphasised that what is needed is "professionalism and management." Contemporary stage technologies show that we can create in-house spark fountains and colourful spark-circles on the floor, he said, adding that televisions routinely employ cold spark systems that generate bright, upward jets of sparkling light without explosive combustion, heavy smoke and high-decibels "but giving the same, if not a superior, visual effect".

"It is possible to deploy arrays of dozens or hundreds of spark units across open grounds, arranged linearly, radially, or in clusters, with sequential triggering of waves, expanding bursts, and cascading effects," he said. These could even be mounted on temporary towers to extend the visual field, "creating the illusion of vertical expansion into the night sky".

#### What is the way forward?

Delhi, which celebrated its loudest Diwali in three years, could also benefit from cold spark technology. As for Thirissur, Prof. Gurukkal said there should be an incremental transition strategy in Kerala, but that it would be ideal "to start with the Thirissur Pooram, the greatest among occasions that use parangs of intense air pollution with sound and smoke".

Initial integration of large-scale cold spark-based displays should be tested in Thirissur, the district famed in the country for its high-quality air, he said. "It is the responsibility of the Thirissur Corporation to substitute the existing method."

### THE GIST

▼ Noise levels at Thirissur Pooram peaked at 122.4 decibels – close to the legal cap – raising concerns over risks to animals, hospitals, and infant brain development.

▼ Experts call for a shift to noiseless alternatives like cold spark technology, which can deliver similar visual effects without high decibel levels, smoke, or burn injuries.



## GS Paper II – Social Issue

# What Telangana's survey shows about caste inequality

When caste is measured, the gap is not incremental but exponential, with SC and ST households structurally locked in despite economic growth

Srinivas Goli

For decades, Indian policymakers have relied on income as the measure of disadvantage. A landmark government report from Telangana, based on one of the largest population surveys ever conducted in the country, offers a stark correction: when caste itself is measured, the gap is not incremental – it is exponential.

The Telangana Socio-Economic, Educational, Employment, Political and Caste (SEEEPC) Survey 2024, a cross-sectional, census-scale enumeration covering 97% of the State's population (35 million people), introduces a rigorous Composite Backwardness Index (CBI). The findings, published in a government report funded by the Government of Telangana with no external conflicts of interest, show that Scheduled Castes (SCs) and Scheduled Tribes (STs) are not merely "disadvantaged." They are structurally locked in.

**A gap too wide to ignore**  
Using 57 main questions along with several sub-questions, administered

through household visits across the State, the survey calculated CBI scores on a scale where higher values indicate greater backwardness. The results are stark.

An SC community scores 96 out of 100 on the backwardness index, while a general caste (GC) community scores 31. In other words, by the government's own multidimensional metric – covering education, occupation, living conditions, assets, and social integration – the average SC household is three times more backward than the average upper-caste household. The gap is not a margin of error; it is a chasm.

Perhaps the most politically consequential finding concerns scale. The survey assessed 242 distinct castes across Telangana. Of these, 135 castes, a staggering 67% of the State's population, recorded a CBI score higher than the State average.

The report explicitly notes that "not all backward castes are equally backward." There is significant heterogeneity within the Backward Classes category: some groups score close to SCs, while others approach GC levels. This finding destroys the utility of treating any broad category, SC, ST, or BC, as a monolith. Policy

**Telangana is among India's fastest-growing States. Yet the SEEEPC Survey 2024 proves that economic growth and caste inequality operate on separate tracks**

cannot be one-size-fits-all.

**Inequality across spaces and systems**

The survey disaggregates outcomes across rural and urban areas. While urbanisation improves absolute outcomes, a Dalit family in Hyderabad may fare better than one in a remote village. However, urban-rural disparities persist sharply in education, income, and housing quality. Upper castes disproportionately benefit from city growth, while SC/ST households remain concentrated in urban informal settlements with amenities barely superior to rural slums.

The survey also identifies high educational backwardness among ST communities, even relative to SCs. This suggests that tribal communities face distinct barriers, including geographic isolation, language, and cultural distance

from mainstream institutions, that require targeted, not generic, interventions.

**What the data demands from policy**

The Independent Expert Working Group behind the SEEEPC report is unequivocal in its recommendations. The single most crucial lever is education – but not merely access.

"Strengthening government school systems and ensuring quality education is crucial," the report states. This is a pointed rebuke to the current policy obsession with school enrolment (which has improved) over learning outcomes (which remain abysmal for disadvantaged castes). Without functional, high-quality government schools in SC/ST-majority areas, the cycle of occupational segmentation documented in the SEEEPC report will continue across generations for some more time.

The report is not without limitations.

The data are self-reported, which may introduce bias: respondents could under-report discrimination or misrepresent social practices. Moreover, certain forms of unreachability were not explicitly captured, suggesting that the extent of social exclusion may be even greater than documented.

**Growth without equity**

Telangana is among India's fastest-growing States. Its GDP is rising, its cities are expanding, and poverty rates are declining.

Yet the SEEEPC Survey proves that economic growth and caste inequality operate on separate tracks. An SC household remains three times more backward than a GC household, not because of income but due to structural

## A pattern of inequality

The SEEEPC Survey reveals wide gaps across castes, occupations, and outcomes

**Table 1.** Composite Backwardness Index (CBI) by social group

Social group	Mean CBI score	Relative backwardness (vs. General Castes)
Scheduled Castes (SC)	96	3.1x more backward
Scheduled Tribes (ST)	95	3.0x more backward
Backward Classes (BC)	86	2.7x more backward
General Castes (GC)	31	Reference (1.0x)

**Table 2.** Population share of backwardness

Category	Number of castes	Share of State population
Castes more backward than State average	135	67%
Castes less backward than State average	107	33%

**Table 3.** Occupational distribution by social group

Occupation	SC/ST	BC	GC
Agricultural labour	High	Moderate	Low
Informal work	High	Moderate	Low
Salaried/formal jobs	Low	Moderate	High

exclusion embedded in education, labour markets, and social systems.

The message to policymakers is simple: income-based targeting has failed the math test. Only caste-sensitive, multidimensional, and rigorously targeted interventions, beginning with government schools, can begin to close a gap of this magnitude.

*(Srinivas Goli is an Associate Professor of Fertility and Social Demography at the International Institute for Population Sciences (IIPS), Mumbai. Views are Personal)*



### GS Paper II – Social Issue

FULL CONTEXT

# Real equity gap in higher education

Equity in higher education institutions is more constrained by gaps in representation in employment than in admissions; the UGC regulations focus largely on anti-discrimination and complaint-resolution mechanisms, but do not adequately address these structural gaps



According to data submitted by the UGC to a parliamentary panel and the Supreme Court, 376 complaints were reported by Equal Opportunity Cells and SC/ST Cells in 2023-24 across 704 universities and 1,552 colleges. (HTW IMAGES)

Anish Gurus

The new University Grants Commission (Promotion of Equity in Higher Education Institutions (PEHIE) Regulations, 2023, have sparked considerable debate and protests within academic circles and among the general public, both in support of and in opposition. Although the Supreme Court has stayed their implementation, observing that they are vague and potentially open to misuse, the issue has raised several important academic questions – particularly regarding the empirical aspects of equity, discrimination, and caste-based crimes.

#### Equity in HEIs

One of the most important measures of equity is the representation of various social groups in employment and education at different levels within HEIs. A look at Table 1, based on the UGC Annual Report 2023, reveals four key trends in Central universities.

First, compared to the constitutionally mandated reservations for SC (15%), ST (7.5%), and OBCs (27%), the share of those social groups across all levels of teaching and non-teaching jobs is lower. Second, this gap is larger at higher levels of employment than at lower levels. Third, unlike in employment, representation in admissions at all levels (UG, PG, MPhil, and Ph.D.) for all social groups is more or less close to the reservation mandated by the Constitution. Fourth, encouragingly, ST representation in admissions is 1.5 to 2.7 times higher than the mandated level, except at the undergraduate level, where it is slightly lower.

Overall, this suggests that, at the macro level, inequity is more of a problem in employment than in admissions.

It is worth noting that gaps in admissions can be filled within a year, but the same is not true for employment. Even with the strict implementation of reservations, bridging this gap will take many years, as it depends on the retirement of employees who were appointed when reservations were not properly implemented.

#### Data on discrimination in HEIs

Comprehensive data on discrimination-related complaints across all social groups in HEIs is not available, limiting objective and comparable analysis. However, according to data submitted by the UGC to a parliamentary panel and the Supreme Court, 376 complaints were reported by Equal Opportunity Cells (EOCs) and SC/ST Cells in 2023-24 across 704 universities and 1,552 colleges.

Since a breakdown of EOC complaints

#### An uneven ladder

Employment lags behind admissions, while limited data shapes understanding of discrimination and crime.

Table 1: Category-wise non-teaching, teaching staff and admissions in 2023-24

Non-teaching staff	SC	ST	OBC
Group A	5.9	3.9	3.9
Group B	18.7	5.3	23.5
Group C	18.5	6.3	24.4
Teaching staff	SC	ST	OBC
Professor	8.8	2.2	3.2
Associate Professor	8.3	2.9	8.1
Assistant Professor	12.9	4.3	19.3
Admissions in first year	SC	ST	OBC
UG	13.6	5.6	25.8
PG	18.5	16.2	24.8
M.Phil	18.1*	13.7*	26.7
Ph.D.	15.4	26.0*	26.9

by social groups is unworkable, a holistic assessment is constrained. Nonetheless, even if one assumes that all EOC complaints are caste-based, the total number of such cases amounts to approximately 3.7 per one lakh students and about 0.16 per institution (assuming an average enrolment of 4,000 students per HEI). Moreover, the disposal rate for complaints related to SC/ST issues was as high as 90%, an important and often overlooked point.

#### NCER data on caste-based crimes

Data on crimes against SCs and STs are published by the NCER, which classifies all crimes committed against these groups by "Others" as caste-based crimes, which is not accurate. Moreover, the NCER reports only those crimes against SCs and STs committed by individuals outside those communities. It does not provide disaggregated data on crimes occurring within SC and ST communities, as well as comparable data for other social groups. This limits the scope of comparative analysis.

According to NCER data for 2023, crimes against SCs and STs committed by "Others" account for about 0.9% and 0.2% of total recorded crimes, respectively. However, given the limitations of the available data, it may be assumed that the distribution of crimes committed against different social groups broadly reflects their share in the population.

Assuming that crime distribution broadly reflects population shares, SCs (16.6%) and STs (8.6%) would account for 16.6 and 8.6 crimes out of every 100, respectively, with the remaining 74.8 attributed to Others.

It follows from this proportional exercise that the likelihood of a person

Table 2: Crime/abuse against SC/ST in India in 2023

Social group of victim	Social group of accused	Crime incidence	N of total crimes	Crime rate	Charge-sheeting rate	% Population
Crime against Others	Others	25,189	6.9	28.7	61.2	SC-16.6
SC	SC/ST	Na	Na	Na	Na	
Crime against SC	Others	12,982	3.2	37.4	79.9	ST-8.6
ST	SC/ST	Na	Na	Na	Na	
Crime against ST	Others	Na	Na	Na	Na	Others-74.8
Others	SC/ST	Na	Na	Na	Na	
Crime against All	All	32,41,059	1.90	270.3	72.7	100

Source: Crime in India 2023-24, NCER



belonging to SC/ST committing a crime against someone belonging to the SC is roughly 52 times higher than that of a person from other groups. Similarly, the likelihood of a person belonging to SC/ST committing a crime against someone belonging to the ST is roughly 125 times higher than that of a person from other groups.

If we go by the assumption that the share of crimes against SC and ST exceeds their population share, any such excess would necessarily be reflected in crimes occurring within SC/ST communities, since the share of crimes committed by Others is already known and fixed.

#### Issue of underreporting

An important caveat is the underreporting of crimes, especially against SC and ST, by Others. However, even if one assumes, purely hypothetically, that the actual number of such crimes is 900 times the reported figure (an extremely high multiplier), the likelihood of crimes against SC and ST committed by members of their own communities would still be 3.2 and 14.3 times higher, respectively, than those committed by Others.

Moreover, charge-sheeting rates in cases involving crimes against SC and ST are 81.2% and 79.9%, respectively, compared to an overall average of 72.7%. This suggests comparatively stronger procedural follow-through in cases involving crimes against SC and ST than in Others.

These results are not surprising, as crimes tend to occur among individuals in close social and geographic proximity. Conversely, a very low crime rate against a particular social group, compared to the average, may indicate social segregation rather than harmony.

#### Problems with the regulations

The regulations suffer from three major shortcomings. First, the analysis suggests that the primary challenge in HEIs lies in achieving equity in employment – particularly at leadership levels – rather

than in admissions or reported discrimination.

Second, the regulations seem to confuse equity with anti-discrimination.

Equity entails providing targeted support to ensure fair outcomes, whereas anti-discrimination focuses on identifying and remedying discriminatory conduct, typically through complaint-resolution mechanisms. Interestingly, the title refers to the "promotion of equity" and the preamble emphasises both equity and eradication of discrimination, the operative provisions, particularly points 4 (Duty to Promote Equity), 6 (Equity Helpline), and 7 (Measures for Promotion of Equity), are confined largely to the latter. Third, the regulations appear to assume the complete elimination of crimes based on identities. While desirable, this is unrealistic without a broader reduction in overall crime. Overly stringent measures may even risk reinforcing social segregation.

#### What can be done?

Efforts should focus on promoting equity by increasing the representation of reserved categories in employment in HEIs, especially at higher levels, while fostering integration across social groups. Over time, growing interactions may lead the rate of crime against SC/ST to converge with the average crime rate, which could initially result in some increase in reported cases against SC/ST. Therefore, reducing the general crime rate, rather than addressing crimes in isolation, is essential for strengthening social cohesion and building a more inclusive environment.

Since HEIs shape societal values, the UGC should promote measures that foster mutual respect and understanding, while curbing student politics that encourage factionalism and teach young minds to exploit every opportunity for narrow or petty gains.

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## GS Paper III – Environment

### Scaling climate adaptation from policy to grassroots

India is the ninth most climate-vulnerable country globally, with 430 extreme weather events recorded between 1995 and 2024, causing losses of \$170 billion and impacting 1.3 billion people. India's Nationally Determined Contributions (NDCs) for 2031-35 acknowledge these risks and emphasise the mainstreaming of climate resilience and adaptation into the country's development strategy.

The updated NDCs strengthen adaptation across coastal resilience, infrastructure, disaster preparedness, heat mitigation, biodiversity conservation and sustainable livelihoods. This aligns with global commitments to triple adaptation finance by 2035 and the adoption of Belém Adaptation Indicators at COP30. However, achieving these goals will require sustained financing and institutionalising adaptation from national to the grass-root levels.

Among key adaptation efforts, the Indian Council of Agricultural Research (ICAR)'s National Innovations in Climate Resilient Agriculture (NICRA) pilot spans 448 villages across 151 climate-vulnerable hotspots and maps risks in 651 districts, focusing on climate-smart agriculture and farmer capacity-building.

#### A model to watch

India's Economic Survey for 2025-26 recognises Tamil Nadu's Climate Resilient Villages (CRV) programme as a good practice. Under the Tamil Nadu Climate Change Mission (TNCCM), with support from the World Resources Institute (WRI) India, the CRV takes a holistic approach across 11 vulnerable districts, in consultation with local communities and administration. Interventions span water management, flood/drought mitigation, waste management, renewable energy, biodiversity conservation, alternate livelihoods and climate information.

Scaling up such models can help build adaptive capacity throughout the country. However, India's efforts towards adaptation have been scattered which makes financing these



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Adaptation can be advanced through coordinated governance, finance and local efforts

efforts difficult. While India's Economic Survey 2025-26 estimates adaptation and resilience spending at 5.6% of GDP in FY22, the Union Budget 2026-27 remains skewed toward mitigation.

#### Financing adaptation action

Developing countries face an annual financing gap of \$284-\$339 billion through 2035, as per the United Nations Environment Programme's (UNEP) Adaptation Gap Report, 2025. As India looks to sharpen its adaptation focus, domestic resource mobilisation will be key – requiring a clear typology for adaptation finance (which is prioritisation of sectors and assessment of the resources required for each vulnerable sector). However, India's Draft Framework of Climate Finance Taxonomy (2025) remains largely mitigation-focused and looks at emission avoidance, emission intensity reduction (with possible adaptation co-benefits) and activities supporting transition in hard-to-abate sectors.

It is vital to quantify adaptation benefits such as avoidable losses and socio-economic and environmental benefits including mitigation co-benefits. A WRI study estimates a ten-fold return on adaptation investment, making a case for leveraging private and international investment towards adaptation. Adaptation facilities at the state-level can help identify bankable adaptation projects that map benefits and widen the resource base.

Additionally, domestic public finance should be streamlined by tracking adaptation activities within State budgets, following which the Ministry of Finance can mandate climate budgeting through State Finance Departments. This can be integrated within annual budgetary planning processes through a budget circular. Such a mandate must incorporate timeframes for prioritisation of adaptation action with a monitoring framework. This should be complemented with cross-department consultative approaches and capacity building at

nodal departmental levels. NDCs are expected to be operationalised through a National Adaptation Plan, national missions and State Action Plans on Climate Change (SAPCCs). While most States drafted an initial SAPCC, only a few States submitted revisions in tune with NDC updates until 2030. Institutionalising planning requires regular climate vulnerability assessments at the State, district, and block levels, integrating socio-economic and livelihood factors. This calls for robust methodologies, updated data, capacity-building, and standardised monitoring, with periodic reviews and continuous data collection.

Adaptation strategies should ideally go beyond resilient infrastructure to encompass skill development, alternative livelihoods and guidelines for rehabilitation of affected populations. This can be done by leveraging existing State and district climate change cells or setting up new functional cells with a dedicated workforce. Clear reporting channels can further support cross-learning and timely interventions.

#### Facilitating locally led adaptation

Institutional mechanisms should extend to the level of urban local bodies and panchayati raj institutions to scale adaptation action. Locally Led Adaptation (LLA) was stressed at COP30. Co-developing resilience planning with communities – from planning and implementation to management, ownership, and leadership of needs-based interventions – is central to people-centric climate action. Applying place-based and context-specific approaches, such as extending the CRV initiative to different geographies, not only helps raise climate awareness but also enables communities to be a part of decision-making processes.

Preparedness for future climate impacts requires capacity-building and behavioural change across multiple levels. A whole-of-systems approach to adaptation is needed, where national commitments are met through grassroots action.



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## GS Paper III – Environment

### High heat

#### India must address the underlying vulnerability to hot weather

India's summers are known to be hot, but this year the high heat has arrived noticeably early. The India Meteorological Department has sounded heat alerts in central and south India, including in Vidarbha, Chhattisgarh, Odisha, Telangana and Kerala. Parts of Andhra Pradesh and Gujarat have also scaled the 40°C mark, with Tamil Nadu and Karnataka not far behind. Local conditions in coastal areas, in particular, could be worse due to humidity and the urban heat island effect. Warmer nights also delay physiological recovery, increasing the local health-care burden. Such temperatures are usually encountered in May-June but have become apparent in April. While pre-monsoon heatwaves are common in India, they are becoming larger and more intense. This year, a lack of western disturbances and thunderstorms, along with lower convective activity, has also done away with natural cooling, with residual effects of the previous El Niño adding to the heat. Persistently high heat is linked to a significantly higher risk of death from cardiovascular causes. Some 247 billion work-hours were lost in 2024 to heat, according to *The Lancet* Countdown Global Report, with workers in construction and agriculture the most affected. Heat stress is an ongoing concern for farmers during the *rabi* harvest. Hot weather accelerates crop maturity, threatening food security and feeding inflationary pressure.

Experts have complained that most heat action plans (HAPs) – India's primary institutional response to heat – focus on emergency response and lack funds for structural interventions such as urban re-greening and mandatory heat-safety legislation for workers in the informal sector. They have thus failed to address underlying vulnerabilities. On April 23, in the Tamil Nadu and West Bengal polls, and Gujarat and Maharashtra by-elections, lakhs of electors had to brave the heat. Concerns about voter turnout in the heat prompted the Election Commission of India to keep polling booths open longer during the 2024 general election; such reactive measures alone will not suffice this year. If warming continues along current trajectories, more than a few parts of India will begin approaching human survivability limits. HAPs desperately need sufficient, long-term funding while public systems must roll out mobile health units and doorstep delivery of essential services during peak heat to reduce the income penalties that deter access. Colombia has convened a coalition of roughly 50 countries to explore a faster transition away from fossil fuels in a parallel 'climate conference'. India should join it, not least because of the greater access to climate adaptation finance it could afford.



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## GS Paper III – Science & Technology

# Cong. attacks govt. over nod for ethanol in aircraft fuel

Party raises safety concern, says ethanol is less energy dense than ATF and cannot produce enough thrust unless more fuel is used, impacting number of passengers that can be carried

**Jagriti Chandra**  
NEW DELHI

The Congress on Thursday criticised the government over allegedly permitting use of ethanol in aviation turbine fuel (ATF), calling the move a potential risk to aviation safety though the method in question is different from the blending method used in automobiles, is internationally approved and has already been used on a commercial flight.

On Wednesday, the Petroleum Ministry issued a notification expanding the definition of ATF used in flights to include fuel blended with “synthesised hydrocarbons”, effectively opening the door to alternative fuels such as sustainable aviation fuel (SAF).

The notification does not grant any specific approval for ethanol use, though ethanol is one of several recognised pathways for producing SAF. Other feedstocks and routes include used cooking oil, animal fats, municipal solid waste, agricultural residues and bio-waste.

This comes after India's



India's plans to have 1% SAF for international flights from 2027 in its efforts towards a net zero goal for aviation. FILE PHOTO

plans to have 1% SAF for international flights from 2027 under the International Civil Aviation Organisation (ICAO)'s net zero goal for aviation by 2050.

“If they are serious about testing this, let them first use it on [PM] Modi's ₹8,400 crore aircraft or [Nitin] Gadkari's private jet for a couple of years, prove it is safe, and only then consider introducing it to the public,” the Congress's Kerala unit posted on X.

### Chances of freezing

The Congress claimed that ethanol is less energy dense than ATF and can-

not produce enough thrust unless a much higher volume of fuel is used, impacting the number of passengers that can be carried onboard and aircraft efficiency.

It also claimed that since ethanol absorbs moisture, it can freeze at cruising altitudes, where temperatures can fall below -50°C resulting in clogging fuel lines and filters “and potentially cause engine failure mid-air”.

The move comes amid growing concerns over the mandated blending of ethanol into gasoline to produce E20 fuel across fuel

stations, with users reporting reduced fuel efficiency and a noticeable decline in vehicle performance.

### SAF is different

But the process used for gasoline and SAF is fundamentally different.

“The SAF notification employs the term ‘synthesised hydrocarbons’ instead of ethanol, recognising that aviation fuel compatibility requires chemically processed, drop-in hydrocarbon fuels rather than direct ethanol blending,” Indian Sugar & Bio-Energy Manufacturers Association's Director General Deepak Ballani explained.

The use of ethanol in automobiles involves simple blending with petrol (such as E20), where it is burned directly as a fuel.

In contrast, for aviation, ethanol serves only as a feedstock and must undergo complex chemical conversion into jet fuel before it can be used. This also involves dehydration, or removal of water, which also strips out oxygen in the form of H<sub>2</sub>O before the fuel can be safely used in aircraft.



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## GS Paper III – Science & Technology

### Liver disease often goes unnoticed in people with type 2 diabetes

Athira Elsa Johnson

A large proportion of people living with type 2 diabetes develop fatty liver, and nearly one in three may have underlying liver fibrosis without symptoms. Latest evidence published in *The Lancet*, from a large multinational European study of over 30,000 adults shows that undiagnosed liver fibrosis is relatively common, with about 4.6% having significant liver stiffness and 1.6% confirmed cases.

The study found strong links with metabolic factors such as obesity and type 2 diabetes, along with harmful alcohol use, with fatty liver disease accounting for over 90% of cases.

**Fat accumulation to fibrosis**  
Type 2 diabetes is characterised by insulin resistance, which disrupts the metabolism of glucose, fat, and proteins. And one of the consequences is fat accumulation in the liver, known as hepatic steatosis. According to Arulprakash S,



**On the lookout:** Liver disease in type 2 diabetes often remains undetected for years. Screening is therefore essential. B. JOTHI RAMALINGAM

clinical lead and senior consultant, Medical Gastroenterology and Hepatology, SRM Prime Hospital, this fat may remain harmless in some individuals. While it can infect liver cells in some cases, leading to inflammation (steatohepatitis), which can gradually progress to fibrosis and cirrhosis. He notes that genetic predisposition plays a role,

and also not everyone living with fatty liver develops advanced disease.

Vaibhav Patil, consultant, Hepatology and Medical Gastroenterology, Liver Disease and Transplantation, Rela Hospital, explains that insulin resistance is the central cause. It leads to fat deposition in liver cells and attracts

inflammatory cells, causing chronic inflammation and fibrosis. Additional contributors include high free fatty acids causing lipotoxicity, glycated proteins, and disturbances in gut microbiota. Metabolic conditions such as obesity, dyslipidaemia, and hypothyroidism further accelerate liver damage by increasing the flow of harmful fats to the liver. These conditions often coexist with diabetes and act together in disease progression.

#### Late symptoms

Liver disease in type 2 diabetes often remains undetected for years. As doctors point out, slow liver injury does not produce symptoms and is usually picked up only through investigations such as blood tests, ultrasound, or FibroScan.

Dr. Vaibhav Patil notes that the liver has a high functional reserve and lacks pain receptors, which delays the appearance of symptoms even in the presence of fibrosis.

Leelavathy Kandaswamy, Senior Consultant Diabetology and Endocrinologist, Apollo Speciality

Hospitals, explains that patients may feel normal despite ongoing damage. Symptoms such as fatigue, jaundice, abdominal swelling, or fluid accumulation typically appear only in advanced stages, when significant liver injury has already occurred.

#### Need for routine screening

Fatty liver is often reversible with strict glycaemic control and lifestyle modification. However, fibrosis represents a more advanced and largely irreversible stage of liver damage.

Doctors emphasise that fibrosis, not just fat accumulation, is the key determinant of long-term outcomes. It can lead to cirrhosis, liver failure, and hepatocellular carcinoma. They highlight the entry of "lean NASH," particularly seen in developing countries, where individuals who are not overweight still develop fatty liver due to genetic predisposition and visceral fat deposition. This underscores that being thin does not eliminate risk.

Fibrosis can also arise from other causes, including chronic viral

infections such as hepatitis B or C, drug-induced liver injury, heavy metal toxicity, and genetic conditions like Wilson disease or haemochromatosis.

Screening is therefore essential. Studies show that up to 35% of people with type 2 diabetes may have fibrosis without symptoms. Tests such as liver function tests, fibrosis scoring systems (including FIB-4), and non-invasive tools like FibroScan help detect early changes. Monitoring measures such as the CAP score can assess fat content in the liver.

Early detection helps in timely interventions, including weight management, improved blood sugar and lipid control, and medications such as pioglitazone or GLP-1 receptor agonists like semaglutide. Doctors therefore emphasise that integrating liver screening into routine diabetes care can help prevent progression to advanced disease and reduce the risk of long-term complications, including liver cancer. (athira.elsa@thehindu.co.in)



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## GS Paper III – Science & Technology

# Pathogens without payback: when sharing isn't caring

Poorer nations that share critical pathogen data often benefit little from the health outcomes developed using that data; the long overdue PABS framework is critical to fixing this system, with another round of negotiations beginning on April 27, a lot is riding on how quickly and effectively both parties find common ground

Harsh Kabra

**W**hen contagions don't discriminate, why should cures? That question encapsulates a bitter irony of global public health. Countries that contribute the most pathogens to medical research are often the last to benefit from the outcomes.

Low- and middle-income countries (LMICs) in Africa, Southeast Asia and Latin America, where new pathogens often emerge, are expected to proactively share biological materials and genomic data with the world through the World Health Organization (WHO). However, countries that develop life-critical vaccines, therapeutics and diagnostics (VTDs) using that material are under no obligation to reciprocate with fair and timely access to those critical products. Risks are shared; rewards are not.

Despite the proven human cost of this inequity, the historic WHO Pandemic Agreement (WPA), adopted in May 2025, still lacks the much-needed Pathogen Access and Benefit-Sharing (PABS) Annex. Without a binding legal framework to enforce fair sharing from samples to solutions, a coordinated global response to cross-border health crises will remain fraught with challenges.

### The price of survival

A case in point is the influenza vaccine apartheid witnessed during the COVID-19 pandemic, which left LMICs grappling with prolonged vaccine shortages even as high-income countries, according to the People's Vaccine Alliance, hoarded more than half of global vaccine supplies despite representing only around 13-14% of the world's population.

The COVAX initiative delivered just around a fifth of its promised doses by mid-2021 and WHO's COVID-19 Technology Access Pool, meant to facilitate the sharing of intellectual property and manufacturing know-how, drew a blank. Subsequent iterations of the COVID-19 virus resulted in an estimated 1.5 million preventable deaths, delayed recoveries and a whopping \$28 trillion, as per the IMF, in global economic losses.

COVID-19 isn't the only example: the life-saving Ebola drug, Inmazeb, whose estimated per-treatment cost based on procurement data came to a jaw-dropping \$6,300, was effectively beyond the reach of those survivors, as one of the world's poorest regions, who had helped make the treatment a reality through their blood samples and antibodies. When a new outbreak struck in September 2025, killing, as per the WHO, nearly 70% of those infected, all that the WHO could do amid rich countries stockpiling the drug for "emergencies" was to wait for limited donations from the manufacturer.

More recently, the bilateral health compacts signed by the U.S. with more than 15 African nations require them to share pathogens for 25 years in return for just five years of diminishing U.S. funding and nearly no commitments on product access.

PABS seeks to legally link



**Call for change:** Low- and middle-income countries where new pathogens often emerge, are expected to proactively share biological materials and genomic data with the world. However, countries that develop life-critical vaccines using that material are under no obligation to reciprocate, sometimes

sample-sharing to guaranteed benefits, making it mandatory for pharmaceutical manufacturers to provide 20% of real-time VTD production to the WHO during declared pandemics, at least half of it for free and the remaining at reasonable prices. Besides making yearly monetary contributions, manufacturers would also need to transfer technology, build capacity and enable broader production in developing countries through licences.

### Technical gaps

Recent Intergovernmental Working Group negotiations in Geneva, while narrowing certain technical gaps, have not been able to address fundamental disagreements around binding obligations on benefit-sharing, intellectual property and data traceability. With another round of negotiations slated to begin on April 27, the window to secure a meaningful agreement is closing fast. Pushing ahead with a partial framework would undermine global health cooperation and institutional trust, compelling developing countries to settle for asymmetrical health deals.

While PABS is backed by around 100 LMICs, including India, which represent nearly 80% of the world's population and have offered the limitations of voluntary goodwill arrangements, opposition comes from developed countries, especially the European Union (EU), which are home to some of the world's largest pharmaceutical companies.

Proponents of PABS want tighter, enforceable rules and contractual provisions to govern the sharing of samples and benefits, whereas opponents favour voluntary mechanisms over binding contracts, arguing that the added bureaucracy and complexity arising from legal mandates could stifle research and

innovation. This, despite existing global systems – from environmental treaties to public health frameworks – already relying on standard legal instruments to balance access with incentives.

The EU's current model of allowing anonymous access to pathogen sequence data without adequate transparency or traceability is opposed by PABS proponents, who say mandatory user registration is critical for greater accountability. The EU contends that doing so will impede the openness and interoperability of data systems. However, the likes of the European Genome-Phenome Archive, and the Global Initiative on Sharing All Influenza Data (GISAID), often publicly defended by many EU countries, already use secure access and trackable data-sharing systems.

Advocates of PABS want it to be made mandatory for companies and labs to let WHO and its programmes use their products and technologies developed using shared pathogen data under non-exclusive licences so that multiple players can produce and distribute those products and technologies. In contrast, the EU wants this arrangement to be left to the discretion of individual companies.

Supporters of PABS want all agreements to be made public and seek assured representation for civil society in negotiations and systemic oversight. The EU is averse to any such mechanisms. Additionally, PABS supporters want the scope of benefit-sharing to be extended beyond pandemics to include WHO's more frequent PHHC (public health emergencies of international concern) declarations.

### The middle ground

The EU's position is also being challenged by global health groups including the

AIDS Healthcare Foundation, Third World Network and Public Citizen. It is evident, however, that both sides ultimately seek certainty. While developing countries are seeking guaranteed, enforceable benefits, high-income countries, largely at the behest of their pharmaceutical industries, are looking for a legally predictable system that does not weigh down their innovation economics with obligations.

A middle ground for countries to share in the benefits of better pandemic preparedness could be a tiered system with lower obligations during normal times, stronger commitments during pandemics, and a global fund to support poorer countries, sparing manufacturers a disproportionate burden.

For a start, essential elements of access, utilisation, benefit-sharing, IP, onward transfer, dispute resolution and non-compliance could be written into the Annex now and detailed model contracts could be fleshed out over a mutually agreeable timeframe. A mechanism could be worked out to reward, not coerce, manufacturers who share IP.

Developed countries must reassess the impact of their resistance on their credibility with the Global South, while developing countries must show greater flexibility on timelines and payment terms in return for firm commitments on the essentials.

From zoonotic threats such as swine, to engineered pathogens, dual-use biotech and AI-driven cybersecurity risks, the next pandemic may not be too far off. When they meet again in Geneva, both sides must approach the resolution of the PABS impasse as a matter of political will rather than mere bargaining, for no one is safe until everyone is. (Harsh Kabra is an independent journalist and commentator. harshkabra@gmail.com)

### THE GIST

Countries that contribute the most pathogens to medical research are often the last to benefit from the outcomes. Despite the proven human cost of this inequity, the historic WHO Pandemic Agreement (WPA), adopted in May 2025, still lacks the much-needed Pathogen Access and Benefit-Sharing (PABS) Annex

PABS seeks to legally link sample-sharing to guaranteed benefits, making it mandatory for pharmaceutical manufacturers to provide 20% of real-time VTD production to the WHO during declared pandemics, at least half of it for free and the remaining at reasonable prices

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