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Minister Puri hints at fuel price hike as OMCs' mounting losses cause concern

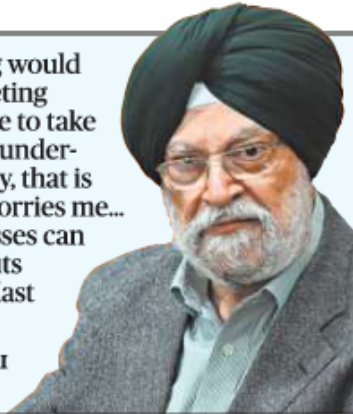
Saptaparno Ghosh
NEW DELHI

Union Petroleum Minister Hardeep Singh Puri on Tuesday reassured consumers about the adequacy of retail fuels, but indicated that a prolonged West Asia crisis could force the government to pass on the pressure to domestic consumers, even as oil-marketing companies (OMCs) continue to bleed losses from holding petrol, diesel and LPG prices firm.

“How long would oil-marketing companies be able to take it [the losses and under-recoveries], frankly, that is something that worries me,” Mr. Puri said at the Confederation of Indian Industries’ Annual Business Summit,

How long would oil-marketing companies be able to take it [the losses and under-recoveries] frankly, that is something that worries me... one quarter of losses can wipe out net profits made during the last [financial] year

HARDEEP SINGH PURI
Union Petroleum Minister



2026. At the present rate, under-recoveries are being incurred, and “one quarter of losses can wipe out net profits made during the last [financial] year”, the Minister added.

OMCs, as Mr. Puri had also indicated earlier, are staring at under-recoveries of up to ₹2 lakh crore during this quarter, with

losses expected to scale to about ₹1 lakh crore.

As for supply, he said, “[There is] no problem on supply management side, [there is] no shortage anywhere.”

“We have 60 days of crude [oil], which is the maximum we need, 60 days of LNG [liquefied natural gas], and we have 45

days of LPG,” the Union Minister added.

The Petroleum Minister also informed that India has ramped up its daily domestic production of LPG from 35,000-36,000 tonnes to 54,000 tonnes.

PM's appeal

Stressing that Prime Minister Narendra Modi's call for diligent use of retail fuel amid the West Asia crisis should be taken as a wake up call, Mr. Puri said there must not be a “bizarre construct” on the austerity appeal.

“If you look at the way it is happening, uncertainty is too mild a word. What he [Mr. Modi] has said is that we have to look at our lifestyle as well. There is no lockdown happening tomorrow,” he said.

▲ ND-NDP



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GS Paper II – Polity

Tamil Nadu's political transition, growth story faultlines

In Tamil Nadu, the electoral triumph of the Tamilaga Vettri Kazhagam (TVK) under the leadership of C. Joseph Vijay is seen as something that would lead to a break from the 'Dravidian Model of development'. But only time will tell if Mr. Vijay's victory is only an extension of Dravidian politics. Going by the TVK's election manifesto, there is scope for continuity, not a break, from extant economic policy. The party's victory comes at a time when Tamil Nadu is faced with a series of challenges. While some are internal, emerging from chinks in the State's relatively better development outcomes and in its political trajectory, others have been aggravated by external challenges such as the shifts in federal relations and the changes in the global economic order.

Successive Dravidian parties have built an economy that is inclusive, productive, and broad-based. The State has shown that economic growth can go together with social development: simultaneous interventions in growth drivers (infrastructure such as power and transport) alongside investments in affordable health and education. It may not be an exaggeration to say that, even without parental support, the probability of a child surviving, getting fully immunised, being fed nutritious food, getting into school, entering college, and progressing to university is far higher in Tamil Nadu than in many other States in India (perhaps, Kerala is the other).

But now, "there is trouble in paradise". New faultlines have emerged in the Dravidian model. Historically, Tamil Nadu's industrial story has rested on a simple idea: using state policy to stitch together the growth of territorially rooted micro, small, and medium enterprises (MSMEs) and large electronics and manufacturing firms, so that learning, jobs, and value creation are spread across regions within the State. That model has weakened with the rise in precarity of jobs and sluggish wage growth. The growth – and indeed there has continued to be growth – has not generated jobs or real wage growth. Ex-post welfare transfers have not cut it either. Not to mention, the increased welfare transfers have come at the expense of fiscal prudence.

Jobs and growth

Tamil Nadu is a global manufacturing hub and its industrial policy, irrespective of the political regime, has remained consistent and non-contradictory. It has, therefore, attracted large global investments such as Hyundai, Ford and Nokia in the past, and Foxconn which manufactures Apple iPhones. However, there has been a gap between the investment promised and actualised. As per Centre for Monitoring



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Indian Economy Pvt. Ltd (CMIE) data, during 2021-25, announced investments rose to ₹6.80 lakh crore, but completed investments stood lower at ₹1.57 lakh crore. The completion ratio stands at 23.09%, which is lower than before. Even these investments did not generate commensurate jobs. The employment elasticity of new jobs is much lower now than in previous regimes: 0.01 per unit of promised capital, less than one job per crore of investment. The latest Annual Survey of Industries tells us that the ratio of jobs created per unit of capital investment, number of workers to gross capital formation, was 0.58 for Tamil Nadu, 0.34 for Gujarat, and 0.33 for Maharashtra. Historically, Tamil Nadu's uniqueness lies in the pursuit of development that delicately balances the needs of capital with a requisite degree of safeguards for workers. As a result, even when the wage share in national income has been falling across the world due to increases in capital intensity, Tamil Nadu has been able to protect its workers, at least relatively.

The wage levels in Tamil Nadu were higher because of lower levels of contractualisation and the better bargaining strength of labour. Relative to its own past, the State is now witnessing rising contractualisation, declining wage shares, and weakening employment elasticity as capital intensity increases. MSMEs are losing ground and many traditional, labour-intensive clusters face a survival crisis. They are yet to recover fully from successive shocks of demonetisation (2016), Goods and Services Tax (2017) and COVID-19 (2020). U.S. President Donald Trump's tariffs have compounded the crisis. The new factories that have come in have weak linkages with the existing small firms. On the other hand, the persisting skill gap in labour market has further limited the ability to generate jobs, adopt new technologies and absorb new entrants.

Aspirations versus achievement

The Dravidian model that generated aspirations among youth has brought new troubles. Its emphasis on education as the route to self-respect translated into broad-based aspirations for success which implied dignity and self-respect. These are values that the Dravidian movement has long stood by. Tamil Nadu is one of the few Indian States that democratised higher education and addressed elite bias. Its gross enrolment ratio (GER) in higher education is 51%, which means that 51% of all youth in the age group of 18-23 years are engaged in some form of higher education, which is twice the national average of 27.1% and comparable to most European countries. It is also inclusive, as the GER of Scheduled Caste (SC) men and women stands at 38.8% and 40.4%, respectively, much

higher than that of upper-caste youth in many States.

But since education expanded without improvements in quality, its returns have declined, weakening the prospect of mobility and opening new pathways for inequality. With education being decoupled from the job market, the relative position of the first-generation graduate has become increasingly fragile when compared to those with generational wealth. Double-digit growth does not mean anything to new entrants if it does not generate jobs with commensurate wages. Educated youth work as delivery agents and gig workers who are exploited by platform companies. A feeling of betrayal has set in. The welfare that follows is not enough and cannot compensate for the loss of dignity that is endured through joblessness or informality. The new welfarism of the Dravida Munnetra Kazhagam party has ensured a vast social and economic safety net for the underprivileged, but these welfare measures did not resonate with first-time voters in 2026. In the absence of meaningful employment, the youth perceive these as measures that take away dignity.

New policies, delivering dignity

No doubt, Tamil Nadu still does better in most indicators vis-à-vis other States. For youth, this is a given. They have been listening to this narrative their entire lives, but that slogan of success does not resonate with their lives. The Dravidian movement took on the old hierarchy but is blind to the new hierarchy, and their own position within it. Thomas Piketty emphasises that besides political equality, voice, power, and participation, and access to basic goods for everyone, the question of dignity is the most severe form of inequality in our times. Tamil Nadu has achieved some degree of equality in basic health, education, food, and transportation through a more generous welfare state. But it has not delivered dignity. So how does one even do that?

Addressing that requires a reworking of the growth strategy to generate decent jobs, better wages and reforming governance to reduce the gap between the governed and the governing, foster associational life among people, and dismantle new sites of hierarchy. In absence of these measures, even welfare, framed in the language of rights, may not work because the line between legitimate welfare and illegitimate bribe, or money-for-votes, has blurred. This often makes youth resentful or confused about what is an entitlement and whether a cash transfer is a right or a bribe. What is thus required is a new set of economic and social policies attentive to these faultlines.

The State's development model is under pressure from changing realities, which the new Chief Minister needs to address



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GS Paper II – Polity

SC upholds right to speedy trial in 1989 Kumbh Mela case

Krishnadas Rajagopal
NEW DELHI

A nearly four-decade-old criminal case involving five Uttar Pradesh police constables, who allegedly brawled over preferential treatment by a canteen cook, has prompted the Supreme Court to reaffirm that the right to a speedy trial is a human right. The court has also ordered a sweeping review of judicial backlogs, vacancies and long-pending bail pleas in Uttar Pradesh.

The case dates back to 1989, when the constables were deployed on Kumbh Mela duty. According to the prosecution, four policemen entered into a verbal altercation with a fifth colleague, accusing the cook of serving him better food. The exchange escalated into a physical fight, leading to criminal charges of ‘simple hurt’ and intimidation.

The trial was transferred to a Magistrate court in Allahabad in 1991, where it remained pending for over three decades.

During the prolonged proceedings, two of the accused died, Uttar Pradesh was bifurcated in 2000 to create Uttarakhand, and the case drifted through the judicial system with little progress. In 2023, the trial court acquitted two of the remaining accused after noting that the prosecution had failed to produce even a single witness in more than 30 years.

However, proceedings

During the prolonged proceedings, two of the accused died. In 2023, the trial court acquitted two of the remaining accused

against the fifth constable continued after the Allahabad High Court refused to quash the case.

Appearing before a Bench led by Justice J.B. Pardiwala, advocate Shashwat Anand, representing the appellant Kailash Chandra Kapri, submitted that his client was 22 years old when the FIR was registered in 1989 and is now 59.

He argued that Mr. Kapri had not received any summons from the court until 2021 and that his fundamental right to a speedy trial had been violated.

Allowing the appeal, Justice Pardiwala held that the right to a speedy trial is an intrinsic part of the fundamental right to life under Article 21 and an essential component of a fair trial.

“The tag of ‘accused’ deprives a man of the right to live with full human dignity... Speedy trial is an integral part of fair trial,” the court observed, adding that the right to a speedy trial is also a human right that cannot be denied in a civilised society.

The judgment further observed that excessive delay in criminal proceedings, including in terror-related cases, may justify the grant of bail.



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GS Paper II – Governance

Split wide open

The AIADMK seems set on the path of self-destruction

It is no surprise that the AIADMK, the principal Opposition party in the previous Tamil Nadu Assembly, is heading towards a split, having faced a second successive setback in the recent Assembly election, apart from several defeats in parliamentary elections. As of now, the 47 MLAs from the Dravidian major are divided over their support for the leadership of General Secretary Edappadi K. Palaniswami, who was until recently the Leader of Opposition. On Monday, the two groups made written submissions to Pro-tem Speaker M.V. Karupiah regarding their claims. Though there is no clarity on the strength of the two factions, the dissident group, led by former Ministers C.Ve. Shanmugam and S.P. Velumani, appears to enjoy the support of more legislators. This group has announced its decision to support the Tamilaga Vettri Kazhagam (TVK) government; Chief Minister C. Joseph Vijay, by visiting the office of Mr. Shanmugam and meeting him and his colleagues on Tuesday, has indicated where his sympathies lie. This appears to be part of Mr. Vijay's political outreach, as he has met DMK chief M.K. Stalin and several other leaders in the past two days. It carries political significance, as the Chief Minister is due to move a trust vote in the House on Wednesday.

Unlike previous occasions when the AIADMK publicly announced the election of its legislature party leader and other functionaries, there has been no official announcement this time. However, the Palaniswami camp claims that at a May 9 meeting, all 47 legislators gave written consent to the effect that the former Chief Minister is the AIADMK legislature party's leader. It also cites the Supreme Court verdict in the Shiv Sena case (May 2023), which held that "the political party, and not the legislature party, appoints the Whip and the Leader in the House". As Mr. Palaniswami is also the general secretary, his supporters argue that there is no need to take cognisance of the other faction's office-bearer announcements, given that he has appointed his nominee as the legislature party whip. The Palaniswami group also appears to be preparing to move the Speaker for disqualification of rebel legislators under paragraph 2(1)(b) of the 1985 anti-defection law, in case the dissidents violate the whip by voting against the government. One option for the Shanmugam-Velumani faction is to merge with the TVK if it secures the support of 32 legislators, similar to how seven AAP MPs in the Rajya Sabha (out of a total of 10 MPs) recently quit and merged with the BJP – which was approved by the Vice President and the Rajya Sabha Chairman C.P. Radhakrishnan. In the case of the AIADMK, Assembly Speaker J.C.D. Prabhakar may soon have to draw on his experience and legal advice to assess the merits of the two groups' claims. Whatever he decides, the churn in Tamil Nadu politics is likely to continue for some time.



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GS Paper II – Governance

MGNREGS workers to go on strike on Friday

The Hindu Bureau

NEW DELHI

The NREGA Sangharsh Morcha and All India Kisan Sabha have called for an all-India strike by Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) workers on May 15, against the government's decision to discontinue the scheme. The Act will stand repealed on July 1, as per a notification issued by the Union government on Monday.

Describing MGNREGA as the "only legal guarantee of employment" for rural workers, AIKS said the scheme has served as a crucial lifeline for poor peasants, agricultural labourers, women, and rural youth.

It alleged that budget cuts, "exclusionary technological barriers", delayed wage payments, and the VB-GRAM(G) Act were undermining the rights-based character of the programme and weakening rural livelihoods.

The organisation endorsed a set of demands raised by workers' groups, including the rollback of the VB-GRAM(G) Act, expansion of MGNREGA to at least 200 days of guaranteed work, and a minimum wage of ₹700 linked to inflation.



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GS Paper II – International Relations

What trade deals promise are far from reality: CEA

There is a 'substantial' gap between what FTAs promise and what regulations currently permit, warns CEA Anantha Nageswaran, days after EU envoy's similar statement on compliance issues

T.C.A. Sharad Raghavan
NEW DELHI

Free Trade Agreements (FTAs) create value only once they are implemented not when they are signed, Chief Economic Advisor V. Anantha Nageswaran asserted on Tuesday, warning that there is a "substantial" gap between what the trade deals promise and what the regulatory frameworks actually allow.

Mr. Nageswaran's comments come days after the European Union's Ambassador to India too warned that compliance issues could still derail the benefits of the India-EU FTA.

During his speech at the Confederation of Indian Industry's Annual Business Summit 2026, Mr. Nageswaran said that the nine trade agreements and comprehensive economic



Chief Economic Advisor V. Anantha Nageswaran at the CII's Annual Business Summit 2026, in New Delhi on Tuesday. ANI

partnerships that India had entered into in the last five years "represent the most concentrated burst of trade diplomacy in independent India's history".

Statements of intent

He added that the frameworks with the United Kingdom, European Union, EFTA, U.S., Oman, New Zealand and Australia

were not merely commercial arrangements.

"They represent a diversification of economic relationships that is simultaneously a statement of strategic intent that India will expand its economic footprint across multiple geographies, reducing dependence on any single market or corridor," he said. However, he also not-

ed that such agreements created value only at implementation, not at signing.

"The gap between the frameworks we have concluded and the depth of integration they would actually permit if the regulatory standards and procedural barriers on both sides were seriously addressed remains substantial," Mr. Nageswaran noted.

"The imperative is to close that gap with the same urgency that was brought to the conclusion of the agreement themselves," he added.

At a separate industry event last week, the EU's Ambassador to India Hervé Delphin pointed out that customs procedures or conformity requirements should serve their purpose and not be used as trade barriers.



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GS Paper II – International Relations

Iran warns of enriching uranium to 90% purity

Reuters

DUBAI

Iranian parliamentary spokesperson Ebrahim Rezaei said on Tuesday that the country could enrich uranium up to 90% purity, a level considered weapons-grade, if Iran is attacked again.

“One of Iran’s options in the event of another attack could be 90% enrichment. We will review it in the Parliament,” Mr. Rezaei posted on X.

The fate of around 400kg of uranium enriched to 60%, a short technical step from roughly 90% weapons-grade material, remains unclear.





GS Paper III – Economic Development

Pricey food, dining out push retail inflation to a 13-month high of 3.5%

T.C.A. Sharad Raghavan
NEW DELHI

Retail inflation quickened to a 13-month high of 3.5% in April 2026, although still coming in lower than what was expected by most economists. The price rise was largely driven by higher food inflation as well as higher prices at restaurants as they passed on higher fuel prices to consumers.

Data on the Consumer Price Index (CPI) for April showed that inflation quickened from the 3.4% registered in March, the first month following the start of the war in West Asia.

“The April inflation reading came in softer than expectations,” Upas-

Price pressures

Retail inflation continued its accelerating trend in April 2026, with food and restaurant costs driving the uptick



na Bhardwaj, chief economist at Kotak Mahindra Bank, said, a sentiment echoed by Madan Sabnavis, chief economist at the Bank of Baroda as well as Rajni Thakur, chief economist at L&T Finance.

“However, the outlook remains clouded with upside risks amid supply side

disruptions from geopolitics and El Nino,” Ms. Bhardwaj said.

Inflation in the food and beverages category climbed to 4% in April from 3.7% in March.

Simultaneously, inflation in the restaurant and accommodation services sector quickened sharply

to 4.2% in April from 2.9% in the previous month.

Ease in transport

Notably, inflation in the transport sector stood at -0.01% in April as compared to 0% in the previous month.

This, according to Ms. Thakur, was more because of the passenger transport services sector rather than the price at which goods were transported.

“While food prices have gone up by around 30 basis points, overall transportation prices have actually eased,” Ms. Thakur said. “This is largely on account of easing prices for the services sector, while prices of transport of goods have increased by 7.6% in the month.”





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GS Paper III – Environment

Managing coexistence in human-wildlife conflict zones

Human-wildlife conflict (HWC) is often framed as a conservation problem. In reality, it is a complex socio-ecological challenge shaped by land use, livelihoods and ecological change. Across continents, interactions between people and wildlife are becoming more frequent and more intense, not because animals are encroaching on human space alone, but because human activity is rapidly transforming natural habitats.

In India, hundreds of people die each year in encounters with elephants, while large numbers of livestock are lost to predators. Similar patterns are reported in parts of Africa, Southeast Asia and Latin America. These conflicts reflect deeper pressures such as habitat fragmentation, agricultural expansion and changing land use. Where biodiversity overlaps with dense human settlement, conflict becomes almost inevitable.

A reflection of ecological imbalance

Geographically, the most severe conflicts occur in South and Southeast Asia and sub-Saharan Africa. Brazil, India, Indonesia, Kenya and Tanzania face recurring challenges involving elephants, big cats and other large mammals. These species require extensive ranges and seasonal movement corridors. When forests are cleared, roads constructed or farms expanded, these natural pathways are disrupted. Wildlife then adapts, often by moving into agricultural landscapes or peri-urban areas in search of food and shelter.

Importantly, animal behaviour in such contexts is rarely “aggressive” in intent. Crop raiding by elephants or livestock predation by carnivores are adaptive responses to ecological constraints. Monkeys and wild boars exploit easily available food near forest edges, while predators turn to livestock when natural prey declines. These patterns reflect ecological imbalance rather than aberrant animal behaviour.

Global responses to HWC show that coexistence is possible when policy moves



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The approach
should be
scientifically
informed,
socially just, and

community-based natural resource management systems, where local communities share tourism revenues and gain rights over wildlife use. This aligns conservation goals with economic incentives, reducing hostility toward wildlife. In central America in Costa Rica, ecological corridors are integrated into national planning to maintain habitat connectivity. Finland combines real-time wildlife monitoring with rapid compensation systems, reducing both risk and resentment.

These approaches share three key features: strong local participation, reliable economic support and the use of ecological data for planning; they treat conflict as a shared management issue rather than a law-and-order problem.

The complexities in India

In India, significant efforts have been made to address HWC through compensation schemes, technological interventions and legal frameworks. However, given the scale and complexity of the challenge, there remains scope to further strengthen implementation.

Compensation mechanisms, while well-intentioned, can benefit from greater timeliness, enhanced coverage and improved accessibility for marginalised communities. Similarly, measures such as solar fencing and early-warning systems have shown context-specific success, but their effectiveness depends on better coordination and ecological planning.

At the policy level, India’s legal framework has played a crucial role in wildlife conservation. Going forward, there is scope to better align these frameworks with the evolving realities of human-wildlife interfaces. As land-use patterns and ecological pressures change, adaptive, locally responsive governance approaches can help strengthen coexistence outcomes.

There is a need to carefully assess the practicality and long-term effectiveness of

occasionally entered public debate; however, experts note that such measures have limited applicability beyond small, intensively managed populations. In the Indian context, where elephants range across vast and fragmented landscapes, the key challenge remains habitat loss, increasing competition for food and water, and growing human-wildlife interface. Therefore, lasting solutions must focus on habitat restoration, ecological connectivity, and community-based conflict mitigation rather than isolated technical fixes.

Evidence from Bhutan and Nepal shows that locally grounded solutions can reduce conflict. Community-managed forests, coordinated grazing and predator-proof livestock enclosures have shown positive results, supported by stable conservation funding mechanisms.

Focus on education and awareness

Climate change is likely to intensify HWC by altering resource availability and forcing both humans and wildlife to adapt. This adds urgency to the need for a shift in perspective. Wildlife cannot be treated as an external threat to be controlled, nor can human livelihoods be side-lined in the name of conservation.

The way forward lies in designing landscapes that accommodate both. This includes securing wildlife corridors, improving land-use planning, strengthening compensation systems, and involving communities as active partners in conservation. Education and awareness can also play a role in rebuilding tolerance and understanding.

HWC is not an anomaly. It is a predictable outcome of how we use land and resources. The challenge is not to eliminate conflict entirely, but to manage it in ways that are scientifically informed, socially just and ecologically sustainable. If approached thoughtfully, coexistence is not only possible, but it is also essential for the future of both people and wildlife.



GS Paper III – Environment

How India is governing its water resources

India's water crisis is often described as one of scarcity. Yet the deeper reality is a paradox: the country receives nearly 4,000 billion cubic metres of annual rainfall, but only a fraction of this water is captured, stored or used efficiently, highlighting a deeper institutional challenge. The question confronting policymakers is not merely how much water India has, but how its water is governed. As India works toward the global commitments of the UN (Sustainable Development Goal 6), and the national aspiration of becoming a developed economy by 2047, strengthening the architecture of water governance will be central to sustaining economic growth and social well-being.

Enduring paradox

India's hydrological arithmetic reveals striking contradictions. The country supports nearly one-fifth of the world's population but has access to only about 4% of global freshwater resources. According to the NITI Aayog Composite Water Management Index, around 600 million people face high to extreme water stress. At the same time, India receives substantial precipitation each year. Hydrological assessments indicate that while total water availability is high, only about 1,100 billion cubic metres are considered usable, due to limitations in storage infrastructure, uneven rainfall distribution and ecological constraints.

The decline in per-capita water availability illustrates this growing stress. In the early years after independence, water availability exceeded 5,000 cubic metres per person annually. Today it has fallen to around 1,400 cubic metres. Groundwater extraction has become the principal coping mechanism. India is now the world's largest groundwater user, accounting for roughly a quarter of global extraction. This dependence has enabled



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Global best practices underscore the value of wastewater reuse, efficient irrigation, and technological innovation

agricultural expansion and rural livelihoods, but it has also resulted in declining water tables across several regions. These realities point to a central conclusion: India's water crisis is as much institutional as it is hydrological.

On water governance

India's water governance operates through a complex, multi-level institutional structure involving the Union government, State governments and local bodies. At the national level, the Ministry of Jal Shakti serves as the nodal authority responsible for water resources, drinking water supply and sanitation. There is also the Central Water Commission which focuses primarily on surface water planning, river basin development and flood control, while the Central Ground Water Board assesses groundwater resources and provides scientific inputs for sustainable aquifer management.

Additionally, the NITI Aayog evaluates water governance performance across States through indicators such as the Composite Water Management Index. This benchmarking mechanism has helped introduce accountability and evidence-based policymaking into the water sector. However, India's federal constitutional structure places most water-related responsibilities with the States. Irrigation, water supply and groundwater regulation fall primarily within State jurisdiction. As a result, State irrigation departments, urban water boards and local governments play a decisive role in implementing water policies. This multi-layered system reflects India's federal design but also creates coordination challenges.

To address institutional fragmentation, the Union government has increasingly relied on national missions that align central funding with State-level implementation. One of the most transformative initiatives has been the Jal Jeevan Mission, launched in 2019, to provide tap connections to rural homes.

Recognising the scale of the task, the mission has been extended until 2028 to enable States to achieve universal coverage.

Groundwater sustainability is being addressed through the Atal Bhujal Yojana, which promotes participatory aquifer management in water-stressed regions. By encouraging community-based groundwater budgeting and monitoring, the programme attempts to correct the long-standing gap in groundwater regulation. The Pradhan Mantri Krishi Sinchayee Yojana promotes micro-irrigation technologies and improved water management practices. Given that agriculture consumes the majority of India's freshwater resources, improving irrigation efficiency is essential.

Urban water management is addressed through the Atal Mission for Rejuvenation and Urban Transformation, which aims to expand water supply networks, sewage treatment systems and wastewater reuse in cities. River basin restoration has also gained prominence through initiatives such as the Namami Gange Programme, which combines pollution control, sewage treatment and ecological restoration in the Ganga basin.

A circular water economy

India's water governance is moving toward a more integrated, circular approach. Global best practices underscore the value of wastewater reuse, efficient irrigation, and technological innovation. Expanding wastewater recycling in Indian cities can ease pressure on freshwater resources, while better crop choices and irrigation methods can improve agricultural water productivity. India's water future will depend less on how much rain it receives and more on how well it is governed. By aligning governance with scientific knowledge, technological innovation, and participatory approaches, India can transform its water economy from a cycle of scarcity to a framework of sustainability.

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GS Paper III – Environment

India's worker population ratio has climbed since 2022

More women are entering the labour force particularly in rural areas

DATA POINT

Chandrasekar K.

The Periodic Labour Force Survey (PLFS) 2025, released by the Ministry of Statistics and Programme Implementation (MoS&PI) for January-December 2025, marks a significant methodological milestone. For the first time, the revamped PLFS covers both rural and urban India monthly – a departure from the earlier July-June urban-only quarterly cycle. It also offers the most granular all-India portrait of the labour market across urban and rural India in recent years.

India's overall Labour Force Participation Rate (LFPR) for all ages stands at 44.9%, which means that around four in 10 Indians are either working or actively seeking work. The figure remains broadly stable at 44.7% in 2024 (Chart 2).

In rural areas, women participate at 34.6%, which is modest compared with men, yet reflective of their engagement in agriculture and household-related work. However, in urban areas, women's participation falls to just 22.2%. The challenge becomes even more acute among urban young women. In these urban centres, nearly two in 10 women are employed. Urban men, by contrast, participate at 59.7% – more than twice that rate. This gap points to persistent challenges within India's urban labour market (Chart 1).

The youth unemployment rate for people aged 15-29 is 9.9%, more than three times the national average of 3.1%. For urban young women specifically, the rate is 18.9%, nearly one in five. These are not women outside the labour force, but women actively seeking work and unable to find it.

The PLFS makes this clear – the unemployment rate measures only those within the labour force, suggesting constraints in employment opportunities despite labour-force participation. The chal-

lenge becomes even more acute among urban young women (Chart 3).

Educated and unemployed

Next, among persons aged 15 years and above with secondary schooling and more, the unemployment rate is 6.5% – more than double the national average. In urban areas, educated unemployment reaches 7.2%, whereas in rural areas it is 6%. This may indicate that rural educated workers are more likely to remain engaged in low-productivity subsistence activities rather than remain openly unemployed. Between 2022 and 2025, the overall unemployment rate has fallen from 3.6% to 3.1%, yet unemployment among the educated remains persistently elevated. The persistence of educated unemployment suggests that employment generation has not fully kept pace with the growth in the educated workforce (Chart 4).

In rural areas, 70.7% of the working women are self-employed – a category that often reflects subsistence activity rather than entrepreneurial choice. In urban areas, 40.4% of working women are self-employed, reflecting a mix of entrepreneurial activity and informal work. Regular wage or salaried employment – often considered a marker of formal work – covers just 9.3% of rural working women, while another 20% are engaged as casual labourers. Urban areas offer a relatively better distribution, with 50.9% of working women in regular wage employment (Chart 5).

The Worker Population Ratio for all persons has climbed from 39.7% in 2022 to 43.5% in 2025. More Indians are working, and more women are entering the labour force, particularly in rural areas where the female WPR rose from 26.9% to 33.8% over the same period (Chart 6).

The writer is an Indian Statistical Service Officer serving as Joint Director in MoS&PI. The views expressed are personal

Job hunting

The data for the charts were sourced from the annual Periodic Labour Force Survey (PLFS) 2025, published by the Ministry of Statistics and Programme Implementation. The data covers the period from January to December 2025. This is India's primary National Statistical Office (NSO) survey tracking employment and unemployment



CHART 1: Labour force participation rates by gender and location in 2025 (in %)

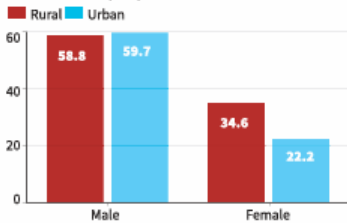


CHART 2: India's overall LFPR in persons aged 15 and above over the years (in %)

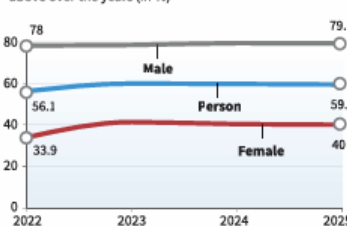


CHART 3: Youth unemployment rate by gender and location (in %) (ages 15 to 29)

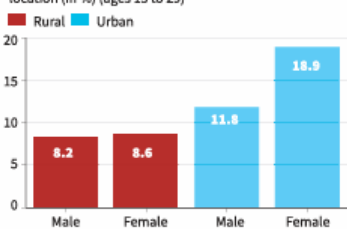


CHART 4: Location-wise unemployment rate among educated persons and all persons (in %)

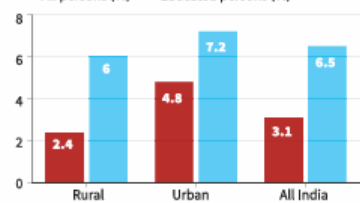


CHART 5: Employment type among women workers (in %)

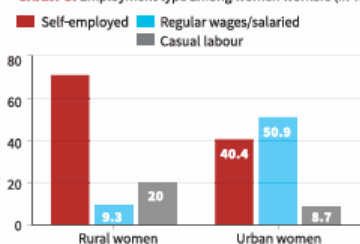
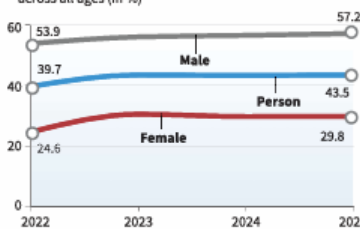


CHART 6: India's worker population ratio over the years across all ages (in %)





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GS Paper III – Environment

Addressing India's electrical fire risks

A pre-dawn fire in Vivek Vihar that killed nine, record electricity demand of 256 GW, and numerous air-conditioners switching on simultaneously, highlight a surge in power consumption and raise concerns over the growing risk of electrical fires in India

EXPLAINER

Kalpana Manojkumar

The story so far:

Just after 3.48 a.m. on May 3, 2025, fire tore through a four-storey building in Vivek Vihar, East Delhi, killing nine. The suspected origin is an air-conditioner blast or short circuit. Delhi Fire Service data attributes over 80 per cent of fires in the capital to electrical faults. Mumbai Fire Brigade, analysing 26,855 incidents over five years, attributes nearly three in four to the same cause. These are reported attributions, not forensic findings, the gap matters. The National Crime Records Bureau (NCRB) recorded 7,566 fire accidents and 7,435 deaths in 2022, with electrical short circuit consistently among the largest single causes, but most incidents land in a catch-all 'other' category, meaning electrical causes are likely under-counted.

India's electricity demand hit 256.11 GW on April 25, 2025, against air temperatures of 47 degrees, roughly double the early-2010s peak. Cooling already pulls about 90 GW at peak; that could rise to 180 GW by 2035. Indians bought 15.4 million ACs in 2025; the IEA expects the installed base to climb from 50 million units in 2024 to 240 million by 2050. Each new unit is a non-linear load plugged into wiring aged, in older buildings, for fans and bulbs.

The vulnerability of older houses to electrical fires

The Forum for European Electrical Domestic Safety (FEEDS) estimates 132 million obsolete electrical installations across the EU, roughly half the residential stock; more than 30 years old and never renovated. The structural problem is the same in any electrifying economy: renovation rates lag behind the build rates of decades past.

India appears to be in the same category of electrical-fire vulnerability as Europe, but its main issue lies less in the age of its housing stock, and more in the combination of rapid load growth, low-voltage installation quality, and weak maintenance. A fan-and-bulb circuit installed in 1985 is now expected to carry a 1.5-tonne inverter AC, an induction hob, a geyser, an EV charger and a string of phone charges. None of those existed when the wires were strung.

The risks posed by air-conditioners

Air-conditioners concentrate every risk mentioned above. They are the largest non-linear load most homes will ever own; start-up current can be six to eight times running current; and they are wired into circuits often shared with other heavy appliances.

There is a second, slower problem: harmonics. Every inverter-driven AC, like every UPS, LED driver, MRI and EV charger, draws current in jagged pulses that inject distortion at multiples of 50 Hz. In three-phase buildings, certain harmonic orders add up in the neutral conductor, a wire never sized to be load-bearing, and quietly heat it.

Supporting studies found that high inverter density on Delhi and West Bengal low-voltage networks raised voltage and current harmonic distortion beyond IEEE 519-2014 limits, while a hospital study in Dhawad recorded unbalanced load, non-zero neutral current, and THD above IEEE 519 guidance. Add a loose joint and you have an ignition source against insulation.



Tragic aftermath: A four-storey building in Vivek Vihar, where at least nine people died and two others were injured in a fire that broke out on May 3, 2025. www.punjabnews.com

The causes of an electrical fire

Electrical fire is a category, not a cause. A peer-reviewed 2025 review in Fire identifies six recurring failure modes: short circuits, overloads, loose or oxidised connections, series and parallel arc faults, ground faults, and equipment ageing. Behind each lies a small set of root causes: connector wire and breakers, undersized circuits for new loads, missed maintenance, poor switchboard terminations, and harmonic distortion that overheats neutrals in three-phase building connections.

A loose connection at a socket or breaker terminal is the most common ignition point in U.S. residential electrical fire; it produces a hot spot that burns insulation over months before anything visible happens. India's SCM Hospital (2016) and AMB Hospital (2002) fires, which together killed 117, both began with electrical short circuits.

Prevention and periodic inspections

Japan made periodic inspection of every domestic electrical installation, every five years, mandatory in the early 1960s; South Korea followed in the 1970s. Recorded fire counts in both countries fell by close to 90 per cent. The EU 2024 Energy Performance of Buildings Directive, in Recital 36, recognises heat pumps, solar photovoltaics, batteries and EV chargers as fire-safety risks.

Lessons for Indian electrical safety standards

The Bureau of Indian Standards publishes IS 30:2025 (National Electrical Code of India 2025). NBC 2006 Part 4 covers fire and life safety, and Indian electrical installations often require contractor

completion and inspectorate approval before energisation; in most EU countries, the utilities typically require an inspection report even before meter connection.

Arc-fault detection devices (AFDD) or arc-fault detection devices are designed to detect hazardous electrical arcs and prevent residential fires by interrupting power before the arcing circuit ignites. Though mandatory in U.S. dwellings since 1999, these devices are essentially absent from Indian residences.

While some specialised industrial or high-end retail channels may offer AFDD-related devices, they are not generally mandated for Indian residences by local building or electrical codes in the same prescriptive manner as in North America. FEEDS notes lower-income tenants are systematically the most exposed, because rented apartment stock is more likely to be older.

Shortage of forensic analysis

The Fire and Security Association of India highlighting a 95% shortage of fire infrastructure points to a systemic capacity problem. Overall, India faces a severe shortage of fire forensic engineers and a heavy reliance on provisional explanations rather than detailed root-cause analysis, even in major incidents.

Safeguards against electrical fires

In the U.S., the plug-in Targ sensor from Whisker Labs samples voltage 30 million times a second and alerts the homeowner when it detects micro-arcing, that can lead to electrical fires. It is in over a million U.S. homes, distributed free to policyholders by insurers including State Farm and Nationwide, who underwrite its

claim of preventing four in five qualifying electrical fires.

The technology is not the bottleneck; the Indian retail and insurance ecosystem is. There is no consumer-priced equivalent on sale in India, and no certification regime selling a buyer in Chennai which IoT energy meter on Amazon India measures harmonics.

An educated consumer's honest options today: insist on ISI-marked wiring, breakers and stabilisers; never run an AC on a shared, untested circuit; have a thermography scan of the main panel every two to three years; service ACs annually; and treat any flicker or buzzing smell as a service call.

Potential measures to address fire safety gaps

First, the IEEE 519-style harmonic compliance and basic power-quality monitoring to building approvals for hospitals, commercial premises, data centres and EV-charging hubs.

Second, introduce a periodic inspection regime for existing installations, on the Japan/Korea/EU model, triggered by major load additions: rooftop solar, EV chargers, battery storage.

Third, build a publicised forensic chain after major electrical fires, on the MAIB/NTSB model. Fourth, fix the data: a harmonised dataset across DHS, MFB, NCRB and BIS.

As tens of millions of new ACs switch on to combat 47-degree summers, the gap should be tested again. The ham is already there. The only choice is whether India listens to it before, or after, the spark. (Kajate Mavgaipalli is an Energy and Emerging Technologies expert.)

THE GIST

Delhi Fire Service data attributes over 80 per cent of fires in the capital to electrical faults, with rapid load growth, poor installation quality, and weak maintenance increasing fire risks.

Air-conditioners are among the heaviest electrical loads in homes, with start-up currents several times higher than running current, and are often wired into circuits shared with other heavy appliances.

ISI-marked electrical equipment, dedicated AC circuits, periodic thermography scans, annual servicing, and immediate attention to flickering or buzzing smells can help prevent electrical fires.





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GS Paper III – Science & Technology

Cancer immunotherapy may reshape brain's barrier to metastasis

Scientists have found that drugs called PD-1 inhibitors can make the blood-brain barrier more permeable, a process mediated by the DKK1 protein; this finding explains why some patients develop brain metastases during treatment and suggests new ways to improve drug delivery to the brain

Shweta Yogi
PUNE

Drugs that enhance the body's immune response against cancer may also be altering one of its most tightly guarded boundaries: the blood-brain barrier (BBB).

A recent study published by Yuval Shaked at the Technion-Israel Institute of Technology and his team, in *Cancer Discovery*, finds that PD-1 inhibitors, a widely used class of cancer immunotherapy, can prompt immune cells to produce a protein that makes the barrier more permeable. This could potentially change how cancer and its treatments affect the brain.

Many conventional anti-cancer drugs cannot cross the BBB, which is a tightly packed lining of cells that controls what passes from the bloodstream into brain tissue, limiting their effectiveness against brain tumours.

So the brain was long thought to be largely insulated from the immune system, but growing evidence shows it can mount meaningful immune responses. In this context, immunotherapy works by activating circulating immune cells that can cross the BBB and target tumour cells within the brain.

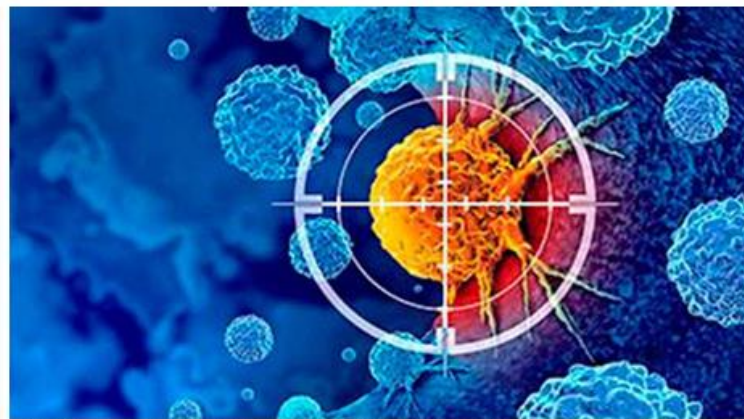
A type of immunotherapy called immune checkpoint inhibitors (ICIs) block signals that prevent immune cells from attacking tumours, allowing the body's natural defences to respond more strongly. While ICIs have been shown to reduce tumour burden within the brain, responses among patients with brain metastases vary and the reasons remain unclear.

"Our work focuses on understanding how cancer treatments affect the body, not just the tumour. In some cases, therapies can trigger responses in normal host cells, such as immune cells, that unintentionally make the environment more favourable for cancer growth," Abhilash Deo, a postdoctoral researcher at the Shaked Lab and the study's lead author, said.

Brain environment

To understand how immunotherapy affects the brain immune environment, researchers examined brain tissue from mice with breast tumours treated with anti-PD-1 therapy. They observed a loss of cells that maintain blood vessel stability, weaker barrier proteins, and higher immune cell entry into the brain, suggesting that the BBB was becoming leaky.

Mice treated with anti-PD-1 also showed an increase in brain metastases, likely due to the compromised barrier. Notably, these effects were observed only with



A type of immunotherapy called immune checkpoint inhibitors block signals that prevent immune cells from attacking tumours, allowing the body's natural defences to respond more strongly. Representative illustration. GETTY IMAGES

anti-PD-1 and not with other ICIs, highlighting a unique host response induced by treatment.

"Our data show that anti-PD-1 therapy can boost anti-tumour immunity in the brain, but in resistant cancers, it may also increase metastasis by altering the host immune environment," Dr. Deo said. "This could help explain why patients with brain metastases show varied responses to immunotherapy."

According to Nirmal Raut, medical oncologist at the Bhaktivedanta Hospital and Research Institute in Thane, treatment responses to ICIs vary widely among patients with brain metastases, ranging from complete remission to rapid disease progression (seen in about 20% of cases after treatment starts).

"We often see discordant responses, where disease outside the brain is controlled, but new brain lesions appear, or vice versa, suggesting that the brain-immune ecosystem is distinct from the rest of the body," he added.

Dr. Raut noted that even when a tumour responds to treatment in organs such as the lung or liver, the BBB can act as a sanctuary where sub-therapeutic drug levels allow cancer cells to survive and evolve.

When untreated animals were injected with plasma from mice treated with anti-PD-1, the researchers observed BBB leaks, suggesting that treatment-induced ICIs were disrupting the barrier.

Comparing plasma protein profiles of treated and untreated animals, the team identified several proteins linked to BBB

disruption. Among these, removing a protein called DKK1 reduced BBB leakage.

Importantly, these findings were reflected in patient data. MRI scans of patients with lung cancer who received anti-PD-1 therapy showed increased cancer spread within the brain. Higher levels of plasma DKK1 were also linked to a greater occurrence of brain metastases and a shorter period before the disease worsened, particularly among patients who responded poorly to treatment. "This aligns with the idea that elevated DKK1 may point to a more permissive brain environment for metastasis," Dr. Raut said. He added that the increased contrast seen on some MRI scans after starting immunotherapy may not always indicate "pseudoprogression" or inflammation but could instead reflect actual BBB leakage caused by activated immune cells.

Double-edged role

Chakor Vora, a medical oncologist at the Renatus Cancer Centre, Pune, explained that most chemotherapeutic drugs can't cross the BBB, posing a major challenge in treating brain metastases.

Opening of the BBB following anti-PD-1 therapy may therefore improve their delivery to the brain. The researchers found that anti-PD-1 therapy followed by cisplatin chemotherapy improved survival in mice with brain metastases as well as increased drug accumulation in the brain, highlighting a double-edged role.

Dr. Raut said that among patients who don't respond to treatment, opening the

BBB using anti-PD-1 therapy could inadvertently allow circulating cancer cells also to enter the brain, potentially increasing the risk of new metastases.

"However, for patients with resistant disease, this same vulnerability could be exploited to improve drug delivery to the brain," he said.

Rahul Solanki, a medical oncologist and a physician of nuclear medicine in Adelaide in Australia, added that once cancer has spread to the brain, the BBB may already be disrupted, and such patients are often excluded from clinical trials. Since medical workers can't measure drug levels in the brain, DKK1 may be a promising biomarker that could help identify patients at higher risk of developing brain metastases during treatment.

"Patients with advanced cancer but without active brain metastases would be better candidates to understand how anti-PD-1 therapy affects treatment response and the risk of metastasis," Dr. Solanki said.

"We typically use a combination of chemotherapy and immunotherapy in high-risk patients with brain metastases, who test positive for immune biomarkers. However, these findings need to be validated in larger studies involving human patients," Dr. Vora stressed.

"If these findings are confirmed in larger human trials, they could change how we sequence treatment," Dr. Raut added.

(Shweta Yogi is a freelance science writer. shweta2152@gmail.com)

THE GIST

Many conventional anti-cancer drugs cannot cross the blood-brain barrier, which is a tightly packed lining of cells that controls what passes from the bloodstream into brain tissue

This limits their effectiveness against brain tumours and the brain was long thought to be largely insulated from the immune system

Immunotherapy works by activating circulating immune cells that can cross the blood-brain barrier and target tumour cells within the brain



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GS Paper III – Science & Technology

Follow the nose



Q: Why are some people mosquito magnets?

A: Scientists are now making progress in deciphering the complex chemical

cocktail that makes particular people more enticing to these disease-spreading bloodsuckers.

A range of sensory cues can cause mosquitoes to pick one human over another — mainly the smell and heat our bodies give off, and the carbon dioxide we exhale. Female mosquitoes — which are the only ones that bite — detect these signals with finely-tuned receptors, then choose their target accordingly.

The idea that mosquitoes prefer particular blood types “has no scientific basis,” Frederic Simard of France’s Institute of Research for Development said. Odour, however, matters greatly: “A soup of molecules produced by our microbiota is more ... appealing to mosquitoes”.

Humans release between 300 and 1,000 different odorous compounds, research has shown, but scientists are only just beginning to understand which ones attract mosquitoes.

In a recent study, researchers released *Aedes aegypti* mosquitoes on 42 women in a lab. The mosquitoes detected 27 odorous compounds. The women the mosquitoes most liked to bite produced a compound made by



A range of sensory cues can cause mosquitoes to pick one human over another — mainly the smell and heat from the body. GETTY IMAGES

the breakdown of a skin oil called sebum.

Drinking beer has also been linked to attracting mosquitoes because it raises body temperature, increases the amount of exhaled CO2 and changes skin odour, according to several studies.

For a 2023 study in the Netherlands, 465 volunteers put their arms in cages filled with female *Anopheles* mosquitoes, which can spread malaria. The volunteers who had drunk beer in the previous 24 hours were 1.35-times more attractive to the mosquitoes.



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