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## GS Paper I – Geography

Date: 27.04.26

### Fossil assemblage in T.N. dates back to Holocene period: ZSI study

**Shankari Nivethitha B.**  
THOOTHUKUDI

A paleontological assessment of fossil assemblage at Panaiyur in Tamil Nadu's Thoothukudi district re-

veals that it belongs to the middle to late Holocene period, approximately 8,000 to 12,000 years ago.

The technical report of the assessment by the Zoological Survey of India (ZSI)

was authored by its scientific team comprising Dola Roy, Debashree Dam, R. Chandran, C. Raghunathan, and Dhriti Banerjee. The team visited the site last January and conduct-

ed a detailed study of these fossils. The study stemmed from a letter sent by former Thoothukudi Collector K. Elambahavath to the ZSI, after a local archaeology enthusiast, Rajesh Sel-

varathi, discovered the site located around 25 km from Thoothukudi.

**Age estimate**

According to the report, the tentative age was deter-

mined based on the stratigraphic position, sedimentological context, degree of fossilisation, and comparison with dated quaternary deposits from the region.

## GS Paper II – Polity

### + Disqualify seven defecting MPs, AAP says in plea to RS Chairman

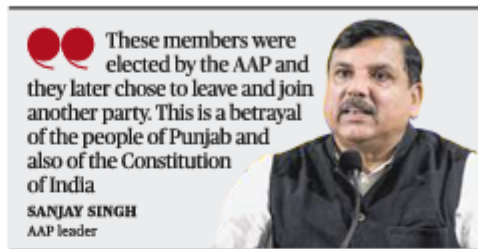
**The Hindu Bureau**  
NEW DELHI

The Aam Aadmi Party (AAP) on Sunday submitted a petition to Rajya Sabha Chairman C.P. Radhakrishnan seeking the disqualification of seven MPs who quit the party and merged with the Bharatiya Janata Party (BJP).

Addressing a press conference, Sanjay Singh, leader of AAP in the Rajya Sabha, said the move by the Raghav Chadha-led group was against the provisions of the anti-defection law.

The party urged the Chairman to terminate their membership, underlining that they were elected to the Upper House on AAP ticket but decided to leave the party and join the BJP. On April 24, Mr. Chadha, Ashok Mittal, Sandeep Pathak, Harbhajan Singh, Rajendra Gupta, Vikram Sahni, and Swati Maliwal quit AAP and merged with the BJP.

AAP has 10 members in the Upper House. The defecting group argues it has the required two-thirds strength to avoid disqualification. AAP, meanwhile, has argued in its petition that the law requires the "original party" to merge and, in this case, AAP has not taken such a call,



which makes a case for their disqualification.

**Consulted experts**

"After consulting constitutional experts and seeking legal opinion from Kapil Sibal [Rajya Sabha member and senior Supreme Court lawyer], I have sent a petition to the Chairman requesting that the membership of these members be terminated as per the 10th Schedule of the Constitution," Mr. Singh said.

He termed the move by Mr. Chadha and the other MPs a "betrayal" of the people's mandate, and said he expected the Chairman to take an "unbiased" decision at the earliest. Six of the seven MPs who quit the party were from Punjab.

"These members were elected by the AAP and later chose to leave and join another party. This is a betrayal of the people of Punjab and also of the Constitution of India," Mr. Singh

said. He added that people are free to quit a political outfit and join another that aligns with their ideology.

"However, those who have been elected by the MLAs of a party are today speaking against the same party. Therefore, I have full hope and confidence that the Chairman will take an early decision on this petition and cancel their membership," he said.

Mr. Singh said Punjab Chief Minister Bhagwant Mann has sought time from President Droupadi Murmu to seek the removal of the Rajya Sabha MPs through the 'Right to Recall'. "He will meet the President and present his views, for which time has been sought. The MLAs who elected these MPs have been betrayed. Now those MLAs are calling them back," said Mr. Singh.

**PROTESTS IN PUNJAB**  
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## GS Paper II – International Relations

# New Zealand, India to sign FTA today; tariffs to go on all exports

**T.C.A. Sharad Raghavan**

NEW DELHI

India and New Zealand will on Monday sign a Free Trade Agreement that will remove tariffs on 100% of India's exports to New Zealand, and either sharply reduce or remove tariffs on 95% of current imports from that country.

Commerce Minister Piyush Goyal on Saturday took to social media to welcome Todd McClay, New Zealand's Minister for Trade & Investment, to New Delhi, ahead of the signing of the pact. "As we approach the #IndiaNZFTA signing on April 27th, his visit marks a defining moment in our bilateral journey, reflecting the trust, shared values, and common vision that underpin our partnership for sustainable economic growth, driving prosperity for both our nations," he said.

India's exports to New Zealand grew 32.1% in 2024-25 to \$711.1 million, the latest full financial year for which there is data. Imports from New Zealand grew 75.2% to \$587.1 million over the same period.

The deal will provide India with immediate duty-free access on 100% of tariff lines. This is down from

the 10% tariff New Zealand currently levies on about 450 tariff lines that India exports, including textiles and apparel products, leather and headgear, ceramics, carpets, and automobiles and auto components.

On average, New Zealand levied a tariff of 2.2% in 2025, which will come down to zero under the agreement.

The pact between the countries is one of the fastest-negotiated trade agreements that India has entered into, with negotiations being announced in March 2025 and concluding in December.

### **Dairy products out**

India has also managed to keep several items out of the FTA, including all dairy products such as milk, cream, whey, yoghurt, and cheese, animal products other than sheep meat, vegetable products such as onions, chana, peas, corn, and almonds, sugar, artificial honey, animal, vegetable or microbial fats and oils, arms and ammunition, gems and jewellery, and copper and aluminium and their products.

**CONTINUED ON**

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## GS Paper II – Polity

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# Right to safe travel on highways part of right to life: apex court

### The Hindu Bureau

NEW DELHI

The Supreme Court has declared that the safety of commuters against road accidents and the right to safe passage on highways are part of the fundamental right to life under Article 21 of the Constitution.

“National Highways constitute approximately 2% of India’s total road length but account for nearly 30% of all road fatalities. A road, particularly a high-speed expressway, must not become a corridor of peril due to adminis-

trative lethargy or infrastructural gaps. The loss of even a single life to avoidable hazards like illegal parking or blackspots, etc., represents a failure of the state’s protective umbrella,” a Bench of Justices J.K. Maheshwari and Atul S. Chandurkar observed in an April 13 order. The court issued a series of directions, including the immediate prohibition on the construction or operation of any new dhaba, eatery, or commercial structure within the right-of-way of any National Highway. The order also directed that

heavy or commercial vehicles should park/stop only at designated bays, lay-bys or wayside amenities.

The order arose from a *suo motu* case based on the tragic loss of a total of 34 lives in successive road accidents on November 2 and November 3 last year in Phalodi, Rajasthan and Rangareddy, Telangana.

The court said the right to life is not merely a guarantee against unlawful taking of life, but a positive mandate on the state to ensure a safe environment in which human life is preserved and valued.

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## GS Paper II – Social Issue

# Information asymmetry in higher education

**E**very admission season in India feels like a marketplace of promises. Brochures look impressive and websites highlight success stories. Yet, even then, students are making some of the most important decisions of their life with limited and uneven information.

India's higher education system has expanded rapidly; enrolment increased from 3.42 crore in 2014-15 to 4.33 crore in 2021-22. The Gross Enrolment Ratio has also improved. The higher education landscape has enlarged from standalone degrees to multidisciplinary ones, and that too of various management categories. However, expansion has made choices more complex.

### Making the right choice

Students and families often face trade-offs between cost, quality, and location when choosing an institution. The core problem is that institutions know far more about their quality than students do. They have detailed knowledge about their faculty, teaching-learning processes, infrastructure, student support systems and placement outcomes. In contrast, students depend on brochures, advertisements, informal advice, and selective placement data. Much of this available information is incomplete or unverifiable. In economics, this situation is called information asymmetry. When one party has more information than the other, decision-making becomes distorted. George Akerlof's idea of the "market for lemons" explains how, in such situations, lower-quality providers can imitate the signals of higher-quality ones. In higher education, this means that institutions offering weaker academic quality can still appear attractive through marketing, branding, or selective disclosure. As a result, students may end up choosing institutions that do not meet their expectations. Simultaneously, good institutions



**Invanranjan Sahoo**

is associated with the National Council for Teacher Education. Views are personal

may not be able to distinguish themselves clearly. This creates a situation of adverse selection, where the market does not reward quality effectively.

The problem is not just about individual choices. It has wider implications. It affects graduate outcomes, employability, and trust in the education system. It also has implications for achieving national goals such as the SDG-4 (ensuring inclusive and quality education) by 2030 and Viksit Bharat by 2047 with a skilled and employable workforce.

### Overload of information

One may argue that there is now more information available than ever before. However, institutional websites, rankings, data portals, and social media may offer vast information, but not necessarily better information.

A large part of the data available is self-reported and often promotional. Definitions of indicators such as faculty strength, research output, and placement outcomes vary across institutions. Some rankings use methods that are not fully transparent. For students and families, this creates confusion. In such situations, students tend to rely on visible signals such as brand name, campus infrastructure, or fees. These signals are easy to observe but they do not always reflect academic quality. When these signals dominate decision-making, institutions may focus more on visibility than on improving provisions related to teaching-learning processes. This is where public ranking frameworks and verified data portals become important.

India's National Institutional Ranking Framework (NIRF), introduced in 2016, is one such effort to standardise information. It uses a common set of indicators such as teaching and learning resources, research output, graduation outcomes, outreach, and perception. It also requires institutions to disclose data in a structured format, the value of

which lies in comparability. When institutions report data using common definitions and formats, it becomes easier for students to make informed choices. Similarly, centralised data portals that provide verified information on enrolment, accreditation, and faculty strength can reduce dependence on informal and unreliable sources.

### Room for improvement

These tools also have limitations. Rankings depend on how indicators are selected and weighted. If too much importance is given to easily measurable factors, institutions may try to improve scores rather than actual quality. Many important aspects of education, such as classroom experience, mentoring, and work-integrated learning, are difficult to measure. There is also a risk of over-interpreting ranks. Differences between institutions may be small, but ranks can create the perception of large gaps. This is why rank bands and methodological transparency are important. Despite these limitations, the absence of credible public information would be far worse. Without verified data, students would continue to rely on biased information. Information asymmetry would remain high, and poor-quality signalling would persist.

If India aims to build a strong and inclusive higher education system, information systems must be a priority. This includes better data verification, clearer definitions, transparent methodologies, accessible platforms and appropriate visualisation. For students, this is about making informed choices. For institutions, it is about credibility and accountability. The key question is simple: can students choose well if they cannot clearly see what they are choosing? Until that gap is reduced, the higher education market will continue to reward not only quality, but also the ability to present quality convincingly.

Institutional websites, rankings, data portals, and social media may offer vast information, but not necessarily better information



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## GS Paper II – Polity & Governance

# SIR pause on way to a billion electorate

The SIR has trimmed India's electoral roll by removing absent, shifted, dead and duplicate names, leading to record turnout percentages across States despite shrunken electorates, while the exercise strengthens the accuracy of the roll, the challenge now is to ensure it remains inclusive and free of disenfranchisement

### FULL CONTEXT

#### Akhay Bhat

Tamil Nadu finished its single-day poll on April 23 with a record turnout of over 85%, surpassing the earlier best of 78.29% in 2011 and a huge 12% higher than the 73.63% turnout in the last Assembly election. The base for the turnout was a trimmed-down electorate of 5.67 crore. While factoring in the high-octane political contest and mobilisation, the turnout rate would arguably be lower if the State electoral roll had retained "ghost electors" – the dead, shifted, absent, and duplicate names – that existed as of October 2025, when the special intensive revision (SIR) kicked in. Similar trend is seen in West Bengal, with a turnout of 92.88% in the first phase. Assam, Puducherry, and Kerala also delivered record turnouts earlier this month, all following the pattern of shrunken electorates. Therein lies a story.

#### Before the turn

In the run-up to its 75th Foundation Day on January 25 last year, also called the National Voters' Day, the Election Commission (EC) announced a grand celebration 'in light of the fact that India's total electorate is approaching the 100-crore mark.' That was a well-made observation by available arithmetic. The electoral database then stood at 99.1 crore, including 21.7 crore young voters aged 18-29. The steadily rising electoral gender ratio had further jumped from 948 in 2024 to 954. With an estimated population of 1.4 billion, India went into the last Lok Sabha elections with 95.88 crore registered voters. International observers have long watched in awe the alphanumerical Indian electorate, with the United States a distant second and countries such as Brazil and Indonesia trailing far behind. As the SIR completed its second phase earlier this month, India's grand list of electors appears poised to be significantly reversing its advance, though it may still be celebrated for other reasons.

India's electorate has been growing constantly, keeping pace with population growth. The logic is simple: all citizens above the age of 18, unless otherwise disqualified, are to be included in the electoral roll of their respective constituencies, where they are ordinarily resident. Broadly estimated at 75% of the population, a billion voters would look natural in the case of a wholesome registration. Interestingly, the electorate has often grown faster, during the 1993-2023 period, the population grew fourfold, from 16 crore to 58 crore, while the electorate grew more than fivefold, from 17 crore to 94 crore.

Starting with 17.32 crore electors in 1958, India's electoral roll has swelled steadily year after year, except for minor aberrations after accounting for births and deaths by lakhs of ground-level staff. Each January, the country releases updated and revised electoral rolls based on a summary revision with reference to last January.

#### The SIR twist

But then came SIR 2025. The revision, which has already covered 13 States and Union Territories, including Bihar in the first phase, has disrupted the usual elective count based on the logic of growing population. In the 12 States and Union Territories where SIR was ordered on October 27 last year – spanning 121



A voter checks his name on the electoral roll after the Election Commission published West Bengal's post-SIR voter list in Kolkata on February 28, 2025

**The SIR is not the answer to the alleged adulteration of democracy by non-citizens or infiltrators, nor is the EC in charge of policing this part. But, SIR has cured the electoral roll of its obesity, giving it a new look**

districts and 1,843 Assembly constituencies – the number of electors has dropped to less than 46 crore from a base of 51 crore. All major States, such as Uttar Pradesh, Tamil Nadu, West Bengal, Gujarat, and Chhattisgarh, have each reported a reduction of more than 10%. Much of the downsizing is due to the removal of ASDD names (absent, shifted, dead, or doubly enrolled), purification being a basic purpose of any electoral revision. States such as Uttar Pradesh and Bihar have a history of job-related migration, warranting the removal of names. The ASDD burden has also accumulated because the last SIR was conducted between 2002 and 2004.

In substantial consideration, SIR entails drafting a new roll, compared to annual revisions, which are corrections on the existing list. But notably, there are a sizeable number of deletions on account of non-return of enumeration forms, non-traceability of persons, objections received through the designated Form 7, and, importantly, for failing the eligibility criteria stipulated for electors under the Constitution, determined through verification of documents.

With the burden of proof shifting to the citizen, for a sizeable section of the population, the SIR has been like re-scanning the franchise.

#### Additions factored

During the SIR process, the trimming is most visible at the draft roll stage and is largely driven by ASDD factors. There is,

however, some recovery on the way to the final roll, thanks to fresh enrolments. In Uttar Pradesh, the initial roll of 35.44 crore slumped to a draft of 32.55 crore, before rising to a final tally of 33.39 crore following substantial additions. Tamil Nadu started with a list of 6.46 crore, which fell to 5.44 crore in the draft roll, but the net final roll was of 5.67 crore electors.

In June last year, Bihar started the intensive revision with a base of 7.89 crore electors and ended up with a final roll of 5.42 crore, improving upon the published draft of 7.24 crore. West Bengal, however, has been a different case, with issues of logical discrepancies affecting the final roll and spilling over into politics and the streets.

#### Reverse journey

Close to 60 crore of India's electors have already gone through the SIR exercise. The aggregate number has declined by nearly six crores over an after-additions. The remaining 40 crore electors, spread across 23 States and UTs, are now preparing for the scrutiny. With standard extrapolation, by the time SIR is completed across the country, the size of India's electorate could fall to around 90 crore.

The stated goal of SIR is to ensure that all eligible citizens, including newly eligible youth and temporary migrants, are included in the electoral roll. The details of the post-SIR final rolls, especially the addition of new electors, bear testimony to this effort. But the activity missed the profile, drowned in the overwhelming narrative of deletion.

In recent years, inclusivity has been a key focus in electoral roll management, addressing gender disparities, improving youth cohorts, and ensuring that persons with disabilities, the third gender community, and Particularly Vulnerable Tribal Groups (PVTG) are fully enrolled in

a campaign mode.

#### Crux of democracy

India has graded itself on both the scale and quality of its elections over the last 75 years. The starting manifestation of both phases is in the country's electoral roll. The litmus test for a credible election begins with the accuracy and completeness of the electoral roll and culminates in the general acceptance of the electoral outcome. Despite the scepticism from Western powers at the dawn of India's independence, the country has stood firm in sustaining an electoral democracy through credible and respectful exercise of the franchise. This is an outstanding fact, irrespective of the recent disputes over the electoral process and management. All interventions, including SIR, have to strengthen the cause.

#### Renew focus on inclusion

The SIR is not the answer to the alleged adulteration of democracy by non-citizens or infiltrators, nor is the EC in charge of policing this part. However, the SIR has cured the electoral roll of its obesity, giving it a new look. The quantitative expansion of India's electoral roll has received a discernible pause.

It is now for election managers to ensure and provide all stakeholders with the confidence that the new slim roll is accurate and free of disenfranchisement. Concerns that the SIR process, in its uncompromising pursuit, should not strip people and groups of their democratic rights on technical grounds must not be seen as hostile.

After the high-profile focus on removing ineligible names, the EC should now invest its energy in reaffirming its collective resolve that no eligible voter is left behind. (Akhay Bhat is former Director General, Election Commission of India. Views expressed are personal)

### THE GIST

India's electorate, which had steadily expanded faster than population growth, is now poised for a reverse trajectory, with numbers potentially falling towards 90 crore as the exercise progresses across the remaining States and UTs.

The revision process, involving draft rolls, verification of documents, objections through Form 7, and non-return of enumeration forms, has in many cases shifted the burden of proof to citizens, making it akin to re-scanning the franchise for sections of the population.

Despite the dominant narrative of deletion, final rolls show recovery through fresh enrolments, reflecting efforts to include newly eligible youth, migrants, and under-represented groups, even as discrepancies in some States continue to spill into politics and public debate.



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## GS Paper III – Environment

# Implement Heat Action Plan, Gupta directs officials; govt. to focus on thermal hotspots

Densely populated areas being given additional ORS stocks, water tankers, says CM; adds detailed study carried out using satellite data to identify high-risk zones; IMD issues yellow alert for today

**The Hindu Bureau**  
NEW DELHI

Amid a steady rise in daytime temperatures, Chief Minister Rekha Gupta on Sunday directed officials to implement the Heat Action Plan (HAP) 2026, adding that the government has conducted a detailed scientific assessment of the city using satellite data to identify high-risk zones.

**Heatwave-like conditions**  
However, despite the prevailing heatwave-like conditions, this year's HAP is yet to be released by the government and is expected to take at least another week, according to sources. Last year's HAP, prepared by the Delhi Disaster Management Authority, had suggested that this year's plan should be finalised before the onset of summer.

Ayanagar in south Delhi is among the most sensitive areas, having previously recorded temperatures as high as 45.5°C. Najafgarh (43.7°C in 2025) and Safdarjung (46.8°C in 2023) have also witnessed extreme highs and will be a focus as "thermal hot-



**Blazing hot:** On Sunday, Delhi recorded a maximum temperature of 42.1°C, 3.1 degrees above normal. SUSHIL KUMAR VERMA

spots", according to a statement by the Chief Minister's Office (CMO).

"In addition, densely populated fringe areas such as Sawda, Mubarakpur Dabas, Bhalswa, Nand Nagri, Gokulpuri and Bakkarwala are experiencing pronounced 'heat island' effects. Special protection measures have been designed for these zones, including increased oral rehydration solution (ORS) stocks at health centres, deployment of quick response teams, and addition-

al water tankers," the CMO statement read.

### Rising temperature

On Sunday, Delhi recorded a maximum temperature of 42.1°C, 3.1 degrees above normal, at the Safdarjung observatory, the city's weather station.

The minimum temperature was 26.2°C, 2.4 degrees below normal, according to the India Meteorological Department (IMD).

The IMD has issued a yellow alert for Monday,

with heatwave conditions likely at isolated places and maximum temperatures expected to reach 43-45°C.

However, very light rain is likely towards the afternoon. Partly cloudy skies and very light rain are forecast for Tuesday and Wednesday, which may bring a slight drop in maximum temperatures.

"To protect schoolchildren, the government may administer an ORS solution before they leave school, if required, to reduce the risk of dehydration during their commute. For construction workers, strict measures will be enforced during peak heat hours. Outdoor work may be halted between 12 noon and 3 p.m. during severe heatwave conditions," the CMO statement read.

"Delhi is also moving towards a 'Cool Roof Policy 2026'. Reflective coating has already been applied over nearly 28,674 sq ft at the Kashmere Gate ISBT, helping reduce indoor temperatures. To further combat heat, high-pressure misting systems will be installed at bus stops, while anti-smog guns will be used to cool densely built-up areas," it added.



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## GS Paper III – Science & Technology

# TB patients without documents miss aid

**Soibam Rocky Singh**

NEW DELHI

Homeless tuberculosis patients in Delhi are struggling to access the Centre's Nikshay Poshan Yojana because they do not have Aadhaar cards, bank accounts or mobile numbers, leaving many without the nutritional support meant to aid their recovery.

According to a public interest litigation filed by NGO Social Jurist in the Delhi High Court, 35 patients have not received nutritional support under the scheme, which provides ₹1,000 a month during treatment. It cited the India TB Report 2024, according to which only



Meals at many shelter homes fall short of nutritional needs for those fighting tuberculosis.

about 70% of notified TB patients receive assistance via direct benefit transfers.

At a shelter near ISBT Kashmere Gate, Ranjit Kumar, 26, who came to the city from Varanasi, U.P., for daily-wage work, is undergoing treatment but has not received benefits due to the lack of documents.

"I started treatment, but I have not received the scheme benefit," Mr. Kumar said. He has stopped working as his health deteriorated and now lives at the shelter with 60 other TB patients. Another patient at the shelter, Vijay, 50, from Motihari in Bihar, said he had been homeless for over 15 years. His wife and children left him after his health deteriorated.

Jatin Sharma, co-founder and director of Hausla Health Initiative Foundation, which runs a shelter at Geeta Ghat, said most homeless patients there were not receiving support under the scheme.

Many were severely malnourished at the start of

their treatment.

"The meals available in most shelters – *dal*, *roti*, *sabzi* – may sustain life but fall short of the nutritional needs of someone fighting TB. Even after treatment, immunity remains weak, and relapse is common," he added.

### Court notice

On April 8, the Delhi High Court had issued notices to the Central Tuberculosis Division (CTD) and the Delhi government on the plea.

On the same day, the CTD wrote to the Delhi government suggesting that nutritional support or cooked meals of equivalent value could be provided during treatment.



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## GS Paper III – Economy

# Summer as a source of income shock for gig workers

As India moves into another summer, early forecasts indicate intense heat ahead. Heatwaves are no longer rare; they are a recurring feature of Indian summers. The question is no longer whether extreme heat will return, but whether the country is prepared for its economic consequences.

Official data show that India did experience significant heat-related mortality in 2022. Meteorological trends indicate that heatwaves across large parts of the country have become more frequent and prolonged over the past decade. As policymakers review preparedness measures before peak summer arrives, there is one group which remains largely absent from the adaptation conversation – gig and delivery workers, whose livelihoods increasingly power India's urban economy.

From food delivery riders and e-commerce couriers to app-based drivers and logistics workers, millions now earn income through digital platforms. NITI Aayog estimates India had about 7.7 million gig workers in 2020-21, projected to reach over 23 million by 2029-30. As heatwaves intensify, this growing workforce will be among the most climate-exposed and least protected.

### Heat cuts earnings

For gig and delivery workers, extreme heat is not just a matter of discomfort; it directly affects earnings. Income depends on the number of trips completed, orders delivered, or hours logged on an app. When temperatures surge, movement slows, fatigue increases, and health risks rise; yet, incentive structures remain unchanged.

Unlike salaried employees, gig workers cannot "work from home" or take paid leave during extreme heat. Logging off for a few hours means immediate income loss. Continuing to work through peak heat hours increases the risk of dehydration, heat exhaustion, and longer-term health stress. If the coming summer follows recent patterns, heat will be not just a public health concern but an income shock, forcing



**Krishna Malakar**

Assistant Professor  
in Climate Policy,  
IIT Madras

Resilience for  
gig workers  
means safe  
work and stable  
earnings during  
extreme heat

workers to choose between protecting their health and their earnings.

### Preparedness remains incomplete

India has made progress in recognising heat as a public health risk. Heat Action Plans, early warning systems and emergency measures have improved preparedness in several cities. But most policies still treat heat as a medical emergency rather than an economic risk, assuming that people can adjust their behaviour. Advisories typically recommend staying indoors, reducing physical activity, and taking frequent breaks. But for gig and delivery workers, whose income depends on mobility, these options are not realistic.

Even where cities set up temporary drinking water kiosks, shaded rest areas, or cooling centres, these measures are rarely designed with highly mobile platform workers in mind. As a result, preparedness efforts may reduce mortality, but they do little to prevent income loss.

The weeks before peak summer offer a narrow but important policy window. Heat stress sits at the intersection of climate policy, labour regulation, urban planning and platform governance. Yet, responsibility remains fragmented.

Health departments focus on illness and mortality. Disaster management agencies focus on emergency response. Labour departments grapple with the ambiguous employment status of gig workers. Digital platforms optimise delivery times and incentives, with limited explicit integration of climate risk considerations. When accountability is distributed across institutions without coordination, heat risk for gig workers remains inadequately addressed. These vulnerabilities are further compounded for women gig workers, who often face additional health, safety and unpaid care burdens during extreme heat, making income disruption even harder to absorb.

If adaptation is to move beyond reactive

measures, this is the moment to expand its scope.

First, heat must be treated as a labour and productivity issue, not only a health one. Rest norms during peak heat hours, shaded congregation points, and access to drinking water at common waiting locations should be seen as basic safeguards.

Second, policymakers must acknowledge that extreme heat creates income volatility. Without mechanisms – whether through labour protections or better integration with existing welfare systems – to cushion these losses, adaptation will remain incomplete.

Third, digital labour platforms need to be part of the preparedness conversation.

Heat-responsive design such as moderating delivery pressure during peak heat hours or introducing more flexible performance metrics – can lower exposure without halting services.

Finally, stronger institutional coordination is needed before summer intensifies. Collaboration among labour departments, urban local bodies, disaster management authorities, and platform regulators would signal that heat risk is being treated as an economic issue, not just a seasonal emergency.

### Rethinking resilience

India's cities increasingly depend on gig and delivery workers to function. Food, medicines and essential goods move through urban systems because this workforce absorbs daily risks. As temperatures rise, those risks will intensify.

Climate resilience cannot be measured only by advisories issued or cooling centres opened. For gig workers navigating city streets on two-wheelers and bicycles, resilience means the ability to work safely – and to earn without enduring silent income losses during extreme heat.

If heat preparedness continues to overlook gig and delivery workers, the country will enter another season of rising temperatures without protecting one of its most visible and essential workforces.