

The Hindu Important News Articles & Editorial For UPSC CSE

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Page 07 : GS 3 : Science & Technology / Prelims

In January 2025, the global network of gravitational-wave detectors — LIGO (U.S.), Virgo (Italy), and KAGRA (Japan) detected the clearest gravitational wave signal ever recorded, named GW250114.

- This event, originating from the merger of two black holes about 1.3 billion light-years away, has become a landmark discovery in astrophysics. Importantly, it provided the strongest observational evidence so far for Stephen Hawking's black-hole area theorem, a cornerstone of modern gravitational physics.

Background

- Gravitational waves were first detected in 2015 (event GW150914), a century after Albert Einstein's General Theory of Relativity (1915) predicted their existence. These waves are ripples in spacetime produced by massive accelerating bodies like colliding black holes or neutron stars.
- The 2015 discovery not only confirmed Einstein's theory but also opened a new window for observing the universe through gravitational-wave astronomy. The 2025 detection marks a decadal milestone, offering an unprecedentedly clear signal that allows deeper testing of the laws governing black holes.

Key Highlights of GW250114

- Most Precise Detection Yet:** Improvements in detector sensitivity (reduced laser noise, cleaner mirrors, and lower uncertainties) made GW250114 the clearest gravitational signal to date.
- Source Characteristics:**
 - Two nearly identical black holes, each ~30 times the Sun's mass.
 - Minimal spin and nearly circular orbits.
 - Distance: 1.3 billion light-years.
- Testing Hawking's Area Theorem (1971):**
 - The theorem states that the total surface area of black holes' event horizons can never decrease during any physical process.
 - Researchers compared the combined area of the two original black holes to the area of the remnant black hole post-merger.

Clearest black hole merger signal yet allows probe of Hawking's law

As the clearest gravitational signal ever detected, GW250114 allowed researchers to draw conclusions about fundamental physics: they analysed the frequencies of gravitational waves emitted by the merger to present the most compelling evidence to date of the black-hole area theorem

Shreejaya Karantha

In September 14, 2025, researchers using a pair of giant detectors in the U.S. detected gravitational waves for the first time — a century after Albert Einstein predicted their existence in his general theory of relativity. For their contributions to building these detectors, called the Laser Interferometer Gravitational-wave Observatories (LIGO), Rainer Weiss, Kip Thorne, and Barry Barish were awarded the Nobel Prize for physics in 2017.

According to the general theory of relativity, when any sufficiently massive object accelerates through spacetime, it will set off ripples of gravitational energy through its fabric. These gravitational waves can travel uninterrupted across billions of lightyears at the speed of light. The louder waves are produced by the most fierce cosmic events, including colliding neutron stars and black holes.

This year, as researchers worldwide celebrated the 10th anniversary of the first detection of gravitational waves, they also announced another groundbreaking discovery. A network of detectors — LIGO in the U.S., Virgo in Italy, and KAGRA in Japan — had detected a clearer gravitational-wave signal from a pair of merging black holes. The event was named GW250114 as it was detected on January 14, 2025.

Notably, the researchers said this was the clearest gravitational wave signal detected to date, allowing them to use it to test some of the more elusive predictions of fundamental physics theories.

Their results were published in *Physical Review Letters* in September.

Black-hole hunter

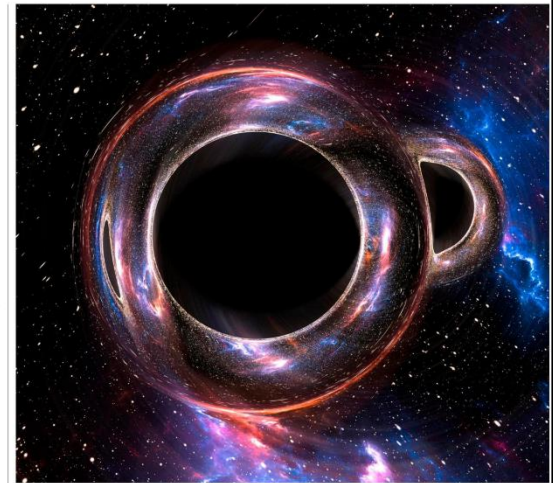
The two LIGO detectors first detected GW250114. Each LIGO consists of two 4-km-long arms arranged in an L-shape. The arms have a vacuum. At the elbow, a highly stable laser beam is split into two beams and sent down the perpendicular arms, bouncing back and forth between mirrors about 300 times.

When no gravitational wave is passing through the detector, the two beams recombine at a photodetector at the elbow. But when a gravitational wave is passing through, it distorts spacetime there in minute ways, slightly stretching one arm while compressing the other, changing the distance each beam travels by a small fraction. This causes the laser light waves to shift out of phase and produce a measurable flicker of light at the photodetector.

Virgo and KAGRA work on similar principles. When a gravitational wave is detected, the teams operating these three detectors share their data and run joint analyses.

"We look for signals in the data from our detectors with several methods. Some are model-agnostic and others are model-independent," study coauthor, Virgo team member, and Gran Sasso Science Institute doctoral student Jacopo Tisino said.

Model-agnostic methods try to identify excess energy that appears simultaneously across all detectors.



Artwork of a pair of merging black holes with differing masses. The gravity of the black holes bends and twists light around them. CAVUKOVA, QJZHEK, SIMONEAU/UNIVERSITY OF TECHNOLOGY

without making any assumptions about the nature of the signal. In contrast, model-dependent methods search the data specifically for signals that align with theoretical expectations for black-hole mergers.

The GW250114 signal, which came from about 1.3 billion lightyears away, was detected using both methods.

Cosmic hell

The team found that the new signal was similar to the one detected in 2015.

"They are both pairs of nearly identical black holes, with small or no spin, masses just over 30-times that of the sun each, and revolving around each other in an orbit that's close to a circle," Mr. Tisino said.

Thanks to advances that increased the detectors' sensitivity, the new signal was also much clearer. According to Mr. Tisino, these advances include lower laser noise, cleaner mirror surfaces, and lower measurement uncertainty.

As the clearest gravitational signal ever detected, GW250114 allowed the researchers to draw important conclusions about fundamental physics. Notably, they analysed the frequencies of gravitational waves emitted by the merger to present the most compelling observational evidence to date of the black-hole area theorem, which Stephen Hawking proposed in 1971.

The theorem states that the total



We look for signals in the data from our detectors with several methods. Some are model-agnostic and others are model-independent.

JACOPO TISINO

GRAN SASSO SCIENCE INSTITUTE

surface area of black holes should never decrease, referring to the sum of the areas of the event horizons.

To this end, researchers independently analysed the signals from the early stages of the merger, when the black holes were relatively far apart, and from a later post-collision stage, when the merged black holes were settling into a single entity.

"With these two analyses, we could extract the areas of the initial two black holes and of the remnant left after the collision, and directly compare them to confirm that there was an increase as predicted," Mr. Tisino said.

Growing catalogue

After the merger, the researchers also "listened" to the new black hole's vibrations and identified two distinct modes of ringing. These frequencies indicated that the resulting black hole behaved like a rotating black hole. Such black holes are expected to emit

gravitational waves at specific frequencies and these waves are expected to fade at a certain rate.

As a result, the new study was also able to empirically verify a solution that New Zealander mathematician Roy Kerr had proposed for rotating black holes in 1963.

Mr. Tisino said that for signals like GW250114, the main sources of error are well-understood and can be controlled.

Researchers carefully selected data from different points of time before and after the merger and tested different assumptions, like whether the black holes' orbits were circular or eccentric. In the process, they checked potential issues in the detectors' calibration and confirmed they didn't affect their analyses.

The continuing detection of merging black holes is helping astrophysicists build a steadily growing catalogue that's helping them fine-tune their understanding of black-hole formation and test more and more intricate predictions.

As the authors wrote in their paper, "The gravitational-wave signal GW250114 is a milestone in the decade-long history of gravitational-wave science. ... The next decade of gravitational-wave science is bound to enhance our view of these highly dynamical, relativistic systems." (Shreejaya Karantha is a freelance science writer: shreejaya.karantha@gmail.com)

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○ The result confirmed that the total area increased, offering the strongest empirical support yet for Hawking's theoretical prediction.

4. Verification of Kerr's Solution (1963):

- Post-merger vibrations matched the pattern expected from a rotating (Kerr) black hole, confirming Roy Kerr's mathematical solution to Einstein's equations.

5. Scientific Significance:

- Provided a clean, high-fidelity dataset for testing general relativity in strong gravitational fields.
- Helped refine models of black hole formation, rotation, and merger dynamics.
- Contributed to a growing global catalogue of gravitational-wave events.

Implications for Fundamental Physics

- **Validation of General Relativity:** The study reinforces Einstein's theory under extreme gravitational conditions, where traditional tests (like planetary motion or light bending) cannot reach.
- **Empirical Proof of Hawking's Law:** Hawking's area theorem is deeply connected to the second law of thermodynamics — it suggests that the entropy (disorder) of black holes, proportional to their surface area, never decreases. Thus, the result bridges relativity, thermodynamics, and quantum theory.
- **Future Prospects:** The continued enhancement of detectors and collaboration between LIGO, Virgo, and KAGRA promises more precise detections, potentially probing quantum aspects of gravity and even testing Hawking radiation in the future.

Conclusion

The detection of GW250114 marks a historic advancement in gravitational-wave astronomy and in testing the deepest laws of the universe. By offering the clearest confirmation yet of Hawking's black-hole area theorem, it strengthens the foundations of Einstein's general relativity while paving the way for new physics beyond it. As the LIGO-Virgo-KAGRA network enters its next phase, these discoveries not only enhance our cosmic understanding but also bring humanity a step closer to uniting relativity and quantum mechanics — the ultimate goal of modern theoretical physics.

UPSC Prelims Practice Question

Ques: The event named GW250114, recently in news, is related to which of the following?

- (a) Discovery of a new exoplanet in habitable zone
- (b) Detection of the clearest gravitational wave signal from merging black holes
- (c) Observation of the first quantum black hole
- (d) Identification of the largest gamma-ray burst

Ans: b)

UPSC Prelims Practice Question

Ques: Gravitational-wave astronomy is reshaping our understanding of the Universe." Explain this statement in the context of LIGO-Virgo-KAGRA's discoveries. How do such observations help in probing the laws of fundamental physics? **(250 Words)**

Page 08: GS 2 : Governance

The tragic accident at Chevella near Hyderabad on November 3, 2025, which claimed 19 lives, is yet another reminder of India's grim road safety record. Despite losing over 400 lives daily in road accidents, India continues to witness complacency and policy inertia. While air crashes invite immediate national attention, road fatalities — mostly involving poor and vulnerable commuters — rarely lead to meaningful reforms.

Key Analysis

1. Structural Causes of Road Accidents

Official data often cites human error as the main cause, but the real problem lies deeper — in inadequate infrastructure, weak licensing systems, and poor vehicular standards.

- **Infrastructure Deficiencies:** Many highways, including National Highway 163 where the accident occurred, lack dividers, streetlights, and proper signage. Potholes, unsafe curves, and missing crash barriers make Indian roads hazardous.
- **Poor Road Design and Maintenance:** Despite Indian Roads Congress guidelines, many states fail to enforce safety audits and design standards, leading to fatal design flaws.

2. Licensing and Enforcement Gaps

India's driving licence system emphasizes mechanical skill over safe driving knowledge and awareness.

- Corruption in RTOs and the absence of structured driver education have led to untrained and unsafe drivers.
- The SaveLIFE Foundation recommends creating License Seva Kendras (similar to Passport Seva Kendras) for transparent, digital, and safety-oriented licensing.
- Lack of enforcement on lane discipline, tailgating, and wrong-side driving contributes to one in five accidents being head-on collisions.

3. Lack of Post-Accident Response and Healthcare

Even when accidents occur, emergency medical response and trauma care are grossly inadequate.

- While urban areas like Hyderabad have nearby hospitals, in states such as Bihar, fatality rates are nearly double due to poor trauma care infrastructure.

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Death on the move

Road accidents are not resulting in an overhaul of infrastructure and licensing

The highway accident on November 3 that claimed 19 lives at Chevella near Hyderabad was far too routine to change India's disgraceful record in fatal road accidents. The driver of a gravel-laden truck apparently swerved to avoid a pothole and rammed into a bus. There were no dividers, no streetlights and no signages on that stretch of National Highway 163. India's roads are a major public hazard. Pedestrians, bus riders and two-wheeler motorists constitute the majority of the over 400 people who die on India's roads on average, the equivalent to a full transcontinental flight going down. Flight disasters invite scrutiny, multi-agency probes and quick remedial actions but road accident deaths that mostly involve poorer folk trigger perfunctory probes and glacial change in rules, if any. Government documents identify human error as the most common cause but deeper reasons — vehicular and infrastructural — are unaddressed.

In India, the road test for getting a driving licence examines whether the person is able to handle a vehicle of certain specification, largely a skill test, rather than one of his knowledge and execution of safe driving practices. No safety training is mandated. Most accidents are collisions from the back — whereas exemplar driving tests in other countries filter out tailgating tendencies and arbitrary lane changing. The system of certifying and monitoring drivers and vehicles is broken and corrupt. For nearly all Indians, navigating RTOs is unpleasant. The SaveLIFE Foundation advocates License Seva Kendras — on the lines of Passport Seva Kendras — so that they are transparent, digitised, and ensure good driver skills and safety awareness. One in five accidents are head-on collisions, which have happened even on four-lane highways, indicating wrong-side driving and the state of road dividers. In general, national highways need to adhere to Indian Roads Congress guidelines but States have made no mandates as required by the Motor Vehicles Act. There are potholes, dangerous curves, drainage systems, bridge parapets and concrete objects, but no crash barriers or energy absorbers. Collision-risk warning devices are relatively inexpensive and can be mandated on commercial vehicles. Better pedestrian infrastructure alone can prevent many fatalities. In Hyderabad, a community health-care centre was available for immediate treatment and a government hospital was not far away. But that is often not the case elsewhere. In States such as Bihar, fatality rates are double because of inadequate trauma care infrastructure. An overhaul of the road transport system is an urgent requirement in India.

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treatment, converting survivable injuries into deaths.

- The absence of integrated emergency response systems delays

4. The Policy and Governance Deficit

Although the Motor Vehicles (Amendment) Act, 2019 aimed to strengthen penalties and accountability, implementation remains weak at the state level.

- States have not mandated safety audits or adopted the Safe System Approach, which views road safety as a shared responsibility among drivers, infrastructure, and enforcement authorities.
- There is minimal investment in pedestrian safety, public awareness, and technology-driven enforcement like collision-warning systems.

Conclusion

India's road safety crisis is not merely a result of individual negligence — it is a systemic failure rooted in poor governance, weak enforcement, and apathy toward infrastructure safety. To reverse this trend, India must treat road fatalities with the same urgency as aviation disasters. A comprehensive approach — combining safe infrastructure, scientific licensing, strict enforcement, and robust trauma care — is essential. Without a structural overhaul, India will continue to lose thousands of lives on roads that remain unsafe by design.

UPSC Mains Practice Question

Ques: Despite multiple initiatives, India continues to witness one of the highest rates of road accident deaths globally. Discuss the underlying causes and suggest systemic reforms for improving road safety. **(150 Words)**

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Page 10 : GS 2 : Indian Polity / Prelims

The recent controversy surrounding alleged contemptuous remarks against the Chief Justice of India and the Supreme Court has reignited the debate over the scope and limits of "contempt of court." At the heart of this issue lies the delicate balance between protecting judicial authority and preserving freedom of expression, both of which are vital pillars of constitutional democracy.

What constitutes as contempt of court in India?

How does the Constitution define courts of record? What are the two types of contempt?

C. B. P. Srivastava

The recent controversy over the alleged contemptuous and derogatory remarks against the Chief Justice of India and the Supreme Court has not only raised eyebrows, but can also be considered an act of diminishing the 'authority' of India's top court. Moreover, such remarks being spread through media and social media may also be seen as an act of interfering and obstructing the administration of justice, thereby directly damaging the edifice of constitutional morality. This has been the basis for the demand to initiate contempt proceedings.

Understanding contempt

The phrase 'contempt of court' is used in Article 19(2) as one of the grounds for imposing reasonable restriction on fundamental freedoms yet the Constitution does not give guidelines on

how to initiate such proceedings. In India, the Supreme Court and High Court have been designated as courts of record under Article 129 and 215 respectively. A court of record is one whose decisions are kept in reserve for future references and inherently it also has the power to punish for its contempt. This implicit constitutional provision is explained in the Contempt of Court Act, 1971.

The Act classifies contempt into civil and criminal. Section 2(b) of the Act defines civil contempt as wilful disobedience to any judgment, decree, direction, order, writ or other process of a court or wilful breach of an undertaking given to a court. On the other hand, criminal contempt is defined in Section 2(c) of the Act, as the publication (whether by words spoken or written or by signs or by visible representations or otherwise) of any matter or the doing of any act which – (i) scandalises or lowers the authority of any court; or (ii)

prejudices or interferes or tends to interfere with, the due course of any judicial proceeding; or (iii) interferes or tends to interfere with the administration of justice in any other manner. This makes it clear that contempt is different from mere disrespect. It is beyond just covering disobedience and disruption in the working of the justice system. The Act further states that the High Court or Supreme Court may initiate contempt proceedings *suo moto*. It may also be initiated by a third party provided the petition has consent from the Attorney General or Advocate General for the Supreme Court and High Court respectively.

The mode of criticism

It is now a settled principle that fair criticism of a decided case is not contempt, but criticism that transgresses the limits of fair commentary may be considered contemptuous as held in

Ashwini Kumar Ghosh versus Arabinda Bose (1952). Further, in *Anil Ratan Sarkar versus Hiral Ghosh* (2002), it was held that the power to punish for contempt must be exercised with caution and shall only be exercised when there is a clear violation of an order. One of the landmark cases is of *M. V. Jayarajan versus High Court of Kerala* (2015) in which the top court upheld a contempt finding against an individual for using abusive language in a public speech while criticising a High Court order, establishing that such actions could be considered criminal contempt for undermining the judiciary's authority and disrupting the administration of justice. The top Court recently in *Shanmugam @ Lakshminarayanan vs. High Court of Madras* (2025) has held that the very purpose to punish for contempt is to ensure administration of justice.

Criticising the Courts' action democratically is not wrong; however, one needs to consider that the judiciary is playing a crucial role by contributing to setting the priorities for the state so that the sanctity of administration of justice is maintained. Both the state and the citizens need to understand that any kind of misrepresentation would not only amount to contempt, it would also be detrimental to democratic principles, affecting the delivery of substantive justice (elimination of injustices).

The author is President, Centre for Applied Research in Governance, Delhi.

THE GIST

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▼ In India, the Supreme Court and High Court have been designated as courts of record under Article 129 and 215 respectively.

▼ It is now a settled principle that fair criticism of a decided case is not contempt, but criticism that transgresses the limits of fair commentary may be considered as contemptuous.

Constitutional Basis and Concept of Court of Record

- The phrase "contempt of court" appears in Article 19(2) of the Constitution as a ground for imposing reasonable restrictions on the freedom of speech and expression.
- However, the Constitution itself does not define contempt or prescribe how proceedings should be initiated.
- Article 129 declares the Supreme Court as a Court of Record, and Article 215 gives the same status to High Courts.
 - A Court of Record is one whose proceedings and judgments are preserved for perpetual memory and reference.
 - It inherently possesses the power to punish for its contempt, safeguarding the dignity and effectiveness of judicial institutions.

Classification of Contempt under the Contempt of Courts Act, 1971

The Contempt of Courts Act, 1971 operationalises this constitutional power and classifies contempt into two categories:

1. Civil Contempt (Section 2 (b))
 - Wilful disobedience of any judgment, decree, direction, order, or writ of a court, or breach of an undertaking given to a court.

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- Example: Non-compliance with a court order despite

being aware of it.

2. Criminal Contempt (Section 2 (c))

- Publication or act that:
 - (i) Scandalises or lowers the authority of any court;
 - (ii) Prejudices or interferes with judicial proceedings; or
 - (iii) Obstructs or interferes with the administration of justice in any other manner.

Thus, contempt is not mere criticism or disrespect, but a serious act that disrupts the functioning of the judicial system or erodes public confidence in it.

Judicial Interpretation and Key Cases

The Supreme Court has developed safeguards to ensure that contempt powers are not used arbitrarily:

- Ashwini Kumar Ghosh v. Arabinda Bose (1952): Fair criticism of a judgment is not contempt, but malicious or baseless attacks on the court's integrity can be.
- Anil Ratan Sarkar v. Hiralal Ghosh (2002): The power of contempt must be exercised with restraint, only when there is a clear and deliberate violation of court orders.
- M.V. Jayarajan v. High Court of Kerala (2015): Abusive language or public attacks on a court's judgment can amount to criminal contempt, as they undermine judicial authority.
- Shanmugam Lakshminarayanan v. High Court of Madras (2025): The Court reaffirmed that the purpose of contempt punishment is not vengeance, but to uphold the administration of justice.

Critical Perspective — Contempt vs. Democratic Criticism

India's democracy encourages critical evaluation of judicial decisions, but such criticism must remain fair, reasoned, and respectful.

- While judicial accountability is necessary, misrepresentation and personal attacks on judges can erode public faith in justice.
- Hence, the challenge lies in maintaining the sanctity of the judiciary while protecting free speech — both indispensable for democracy.

Conclusion

Contempt of court serves as a constitutional safeguard to maintain the dignity and authority of the judiciary — an institution central to upholding the rule of law. However, this power must be exercised sparingly and judiciously, ensuring it does not stifle legitimate dissent. Ultimately, mutual respect between the judiciary, the state, and citizens is vital to sustain both constitutional morality and democratic discourse in India.

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UPSC Prelims Practice Question

Ques. Under the Constitution of India, which of the following are Courts of Record?

1. Supreme Court of India
2. High Courts
3. District Courts

Select the correct answer using the codes below:

- (A) 1 only
(B) 1 and 2 only
(C) 2 and 3 only
(D) 1, 2 and 3

Ans : b)

UPSC Mains Practice Question

Ques : Contempt of court is a necessary evil in a democracy. Examine this statement in the context of recent controversies involving the judiciary. **(150 Words)**

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India's first-ever Household Income Survey (HIS), 2026 is poised to offer a comprehensive picture of household earnings, spending, and economic behaviour across the country. The survey aims to fill a long-standing data gap — accurate, direct information on household income — that has so far been inferred indirectly through consumption or labour market surveys. However, despite its ambitious design, the collection of precise income data remains one of the most complex and sensitive tasks in economic statistics.

Challenges facing the upcoming income survey

The upcoming Household Income Survey promises to provide a detailed snapshot of India's households — their incomes, expenses, and changing dynamics. Yet, collecting accurate income data remains a challenge due to the sensitive nature of the questions, which many respondents may find intrusive or difficult to answer

ECONOMIC NOTES

Vignesh Radhakrishnan

The upcoming Household Income Survey, 2026, which is going to be the first of its kind, could offer the clearest picture yet of India's households, revealing how they are coping, changing, and moving towards the future. However, the challenge with such an exercise lies in the sensitive nature of questions about individual income, which many respondents may be reluctant to answer. While the survey design is valuable from a policymaker's perspective, for respondents, such questions can feel intrusive and, in many cases, difficult to answer accurately from memory.

On past surveys

Indian policymakers lack actionable information about household income. While surveys like the Periodic Labour Force Survey attempts to capture earnings, it views wages and salaries through the lens of labour market dynamics, and falls short of offering detailed insights into household characteristics. The Household Consumption Expenditure Survey (HCES) relies on spending patterns to infer household income. While this survey is considered more reliable, using consumption data as a proxy for income involves a leap that may not always hold up in practice. Then there is the RBI's Consumer Confidence Survey which tracks how income levels rise or fall over time among urban and rural consumers. Put together, these survey tools have either captured broad trends in income changes, relied on proxies to gauge them, or examined income through specific analytical lenses.

The upcoming Household Income Survey, however, aims to collect income data to understand income itself and its interplay with other household characteristics. The new survey gathers



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detailed information on social group, religion, and occupation — covering whether households are engaged in agriculture or other economic activities. It also records land ownership and use, property details such as the size and type of dwelling, and loans taken.

This survey, for the very first time, collects detailed information on regular salaries, including allowances such as overtime pay, performance-based bonuses, stock options, leave encashments, and severance payments. For casual workers, the survey will record the number of days worked, average daily wages earned, and even tips received. In the case of self-employed respondents, it will gather details on the type of crops sold, the quantity, and the value of those sales. For those engaged in non-agricultural work, the survey will note down the sector of business and the gross value of receipts earned.

By combining such information, the survey will make it easier to understand

class dynamics across different types of employment and whether certain jobs are concentrated within specific social groups. It may also shed light on what share of a household's total income goes toward loan repayments — an important metric in an economy driven by EMI-based spending, particularly among urban households. When it comes to agriculture, the detailed questions make this survey an excellent direct tool to test claims like "doubling farmers' income", and assess related government schemes.

Expenses recorded

While measuring income is important, considering spending patterns is equally essential. Therefore, this survey repeats some questions from the HCES. For instance, the survey asks farmers to report input costs for each item, including seeds, labour, and transport. For those engaged in self-employment in other sectors, it seeks details on raw material costs, rental payments, and repair and

maintenance expenses. By gathering both cost and income data from the same households, the survey enables accurate measurement of profit margins.

Additionally, it measures pension payments, family support transfers such as alimony or child support, and remittances. More importantly, for the first time, the survey collects data on funds received through State-specific schemes such as the *Kalaigal Magalir Urimai Thittam* in Tamil Nadu, along with several Union government schemes.

Testing troubles

In August this year, the proposed survey was pilot-tested by randomly selecting households across India to answer its questions. This exercise generated some concerning feedback. Close to 95% of the respondents considered the information to be sensitive and felt uncomfortable disclosing income from different sources. A majority of them refused to answer questions about income taxes paid. Most respondents thus are likely to feel cautious when answering these questions. The survey team is aware of this challenge and is addressing it by increasing public awareness, dispelling misconceptions, and planning outreach across various media. They also aim to deploy field staff familiar with local languages to build trust. The testing team observed that respondents in rural areas sought fewer clarifications, whereas those in affluent households asked for more. Due to this hesitation, unusually, the government is considering introducing a self-compilation system exclusively for affluent and gated communities. Under this system, respondents would receive a written request explaining the survey's objectives and the importance of providing accurate income data. Moreover, during field visits, many households overstated their expenses or misunderstood their income levels. Respondents also found it difficult to recall details about their financial assets and were often unaware of the interest earned from savings or fixed deposits.

THE GIST

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▼ In August this year, the proposed survey was pilot-tested by randomly selecting households across India to answer its questions. This exercise generated some concerning feedback.

▼ A majority of them refused to answer questions about income taxes paid.

Background and Existing Data Gaps

So far, Indian policymakers have relied on indirect indicators to understand income distribution and household well-being:

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- The Periodic Labour Force Survey (PLFS) measures wages and employment, not total household income.
- The Household Consumption Expenditure Survey (HCES) uses spending as a proxy for income, but this can distort reality.
- The RBI's Consumer Confidence Survey tracks perceptions of income changes, not actual earnings.

Hence, no existing survey directly measures household income — a major limitation for designing equitable fiscal and welfare policies.

Key Features of the Upcoming Survey

The 2026 survey marks a methodological shift — it seeks to capture income directly rather than infer it from spending. It will include:

- Comprehensive coverage of all income sources: salaries, bonuses, allowances, tips, agricultural sales, and business receipts.
- Detailed occupational profiling, noting whether households engage in agriculture, services, or manufacturing.
- Property and debt data, including land ownership, dwelling type, and loan repayment share.
- Integration with expenditure data, allowing measurement of both income and cost structures (e.g., farm inputs, business expenses).
- Inclusion of welfare transfers, pensions, and remittances — including funds received through state or central schemes.

Together, these data points will allow policymakers to map class and income disparities, test government claims such as "doubling farmers' income", and assess urban indebtedness in EMI-driven economies.

Major Challenges

Despite its potential, the survey faces significant operational and behavioural challenges:

1. Sensitivity and Reluctance to Disclose

- In the pilot phase, 95% of respondents found income-related questions intrusive or uncomfortable.
- Affluent respondents, in particular, were unwilling to share tax or salary details.
- To address this, the government plans awareness campaigns and a self-compilation system for gated communities.

2. Recall Errors and Misreporting

- Many respondents overstated expenses or underreported income due to poor record-keeping or misunderstanding of financial terms.
- People often could not recall interest earned, bonuses, or irregular income, leading to potential inaccuracies.

3. Design and Data Quality Issues

- Variations in local understanding and language may distort data collection.

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among respondents is crucial to maintain accuracy.

- Ensuring uniform training for field staff and trust-building

4. Complexity in Measuring Self-Employment Income

- Estimating profit margins in self-employment or small business sectors is difficult because of inconsistent accounting and cash-based transactions.

Significance for Policy and Governance

If successful, the survey will become a landmark source of economic evidence in India.

- It will help measure inequality and class stratification more accurately.
- Offer direct input for targeted welfare and tax reforms.
- Enable evaluation of government schemes such as income support and employment programs.
- Improve fiscal planning and poverty estimation, shifting the policy focus from consumption to actual earning capacity.

Conclusion

The Household Income Survey, 2026 represents a crucial leap in India's data architecture — from indirect estimation to direct measurement of income realities. Yet, its success will depend on building public trust, simplifying data collection, and ensuring confidentiality. Overcoming these challenges will allow the survey to serve as a powerful instrument for inclusive and evidence-based policymaking, helping India better understand how its households earn, spend, and strive toward economic security.

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UPSC Prelims Practice Question

Ques : Consider the following statements regarding the Household Income Survey (HIS), 2026:

1. It is the first survey in India designed to collect direct income data from households.
2. The survey will also collect data on expenditure, assets, and welfare transfers.
3. It replaces the Household Consumption Expenditure Survey (HCES) completely.

Which of the statements given above are correct?

- (A) 1 and 2 only
(B) 2 and 3 only
(C) 1 and 3 only
(D) 1, 2 and 3

Ans: a)

UPSC Mains Practice Question

Ques: Discuss the significance of the upcoming Household Income Survey, 2026 in improving evidence-based policymaking in India. What challenges are likely to be encountered in its implementation? **(250 Words)**

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Page : 12 : GS 3 : Indian Economy

The ongoing Free Trade Agreement (FTA) negotiations between India and New Zealand have entered their fourth round this week in Auckland, with agricultural technology (agri-tech) cooperation emerging as a major focus area. New Zealand's Trade and Investment Minister Todd McClay highlighted that sharing scientific expertise and innovation in agriculture would form a "big part" of the discussions aimed at strengthening bilateral economic ties.

Background and Context

India and New Zealand first initiated FTA talks in 2010, but progress has been slow due to differences over agricultural trade and market access.

- New Zealand, a major exporter of dairy, meat, and agricultural technology, seeks greater access to India's large consumer market.
- India, on the other hand, remains protective of its farm sector, emphasizing food security and rural livelihoods.

The renewed engagement follows Prime Minister Christopher Luxon's directive to align New Zealand's trade efforts with India's vision of doubling farmers' income by 2030 — a goal articulated by Prime Minister Narendra Modi.

Key Highlights of the Ongoing Negotiations

1. **Agri-Tech Collaboration:**
 - New Zealand has proposed sharing its expertise in precision farming, sustainable irrigation, soil health management, and dairy technology.
 - This aligns with India's focus on technology-driven agriculture under initiatives such as Digital Agriculture Mission and PM-Kisan Samruddhi Kendras.
2. **Farmer Income and Productivity:**
 - Mr. McClay noted that New Zealand's agricultural innovations have improved farm productivity and incomes, and similar collaboration could help India achieve its 2030 farmer income goals.
3. **Balanced Trade Approach:**
 - Both Ministers — Todd McClay and Piyush Goyal — emphasized finding "solutions together" rather than allowing negotiations to stall over disagreements.
 - India's Commerce Minister clarified that no specific deadline has been set, consistent with India's cautious approach in all FTA negotiations.

Challenges and Divergent Interests

Agri tech a 'big part' of FTA negotiations with India: McClay

T.C.A. Sharad Raghavan
NEW DELHI

Agricultural technology sharing and methods to increase output are a "big part" of the negotiations between New Zealand and India on a free trade agreement (FTA), New Zealand's Minister for Trade and Investment Todd McClay said on Wednesday.

India and New Zealand began the fourth round of negotiations towards an FTA on Monday, with the Indian team visiting Auckland until Friday. Commerce Minister Piyush Goyal also visited New Zealand on Wednesday to discuss various issues with Mr. McClay.

Speaking to reporters in Auckland along with Mr. Goyal, Mr. McClay said that New Zealand had been innovating over the years and working with its farmers to find ways to produce more and to increase its farmers' incomes.

"Prime Minister [Christopher] Luxon has directed me in our discussions and negotiations to make sure New Zealand does its part to help Prime Minister [Narendra] Modi meet his commitment to increasing the earnings of Indian farmers by 50% by 2030," Mr. McClay said.

"So a lot of the science that we have developed here to help them produce more is available to us in cooperation with India and that's been a big part of our discussion around the negotiation so far," he added.

Negotiations with India



Union Minister Piyush Goyal with New Zealand Trade Minister McClay. FILE PHOTO

regarding agriculture have been tricky as the Indian government has been steadfast in protecting the interests of its farmers.

This has been a speed bump in negotiations with the U.S., European Union, and even the United Kingdom.

'Challenges remain'

"It's fair to say that on both sides, there are always challenges in a trade negotiation," Mr. McClay acknowledged.

"What Minister [Piyush] Goyal and I have agreed is that rather than our negotiators arguing, we will find solutions together. And so far, I think we've made great progress."

Neither Minister was forthcoming about a deadline by which the deal would be finalised.

"I don't think we ever discuss deadlines," Mr. Goyal said.

"There never has been a timeframe for any free trade agreement that we have negotiated," Mr. Goyal asserted.

Daily News Analysis

1. Protection of Indian Farmers:
 - India remains wary of cheap dairy and agricultural imports from New Zealand that could undercut local producers.
 - This concern has also slowed progress in FTA negotiations with the EU, UK, and US.
2. Market Access and Tariff Barriers:
 - New Zealand seeks tariff reductions and clearer market entry for its agricultural goods, while India focuses on technology sharing and investment rather than open market access.
3. Non-Tariff Issues:
 - Sanitary and phytosanitary standards, certification norms, and intellectual property rights in agri-tech also remain complex negotiation points.

Strategic and Economic Significance

- For India, enhanced agri-tech cooperation could improve efficiency, crop resilience, and sustainability in its vast agricultural sector.
- For New Zealand, access to India's market and collaboration on research and innovation would diversify its export base beyond traditional partners like China and Australia.
- The FTA also fits within India's "Act East" and "Indo-Pacific" strategies, strengthening ties with a like-minded democracy in the Asia-Pacific region.

Conclusion

The inclusion of agri-tech cooperation in India-New Zealand FTA talks marks a shift from traditional trade negotiations toward technology-driven and mutually beneficial engagement. While challenges over market access persist, a focus on knowledge sharing, innovation, and sustainable agriculture could transform this partnership into a model of inclusive and modern trade diplomacy.

For India, success will depend on how effectively it balances farmer protection with technological advancement, ensuring that global cooperation translates into domestic empowerment and rural prosperity.

UPSC Mains Practice Question

Ques: Agricultural technology cooperation is emerging as a key component of India's new trade diplomacy. Discuss in the context of the ongoing Free Trade Agreement (FTA) negotiations between India and New Zealand. **(250 Words)**

Page : 08 Editorial Analysis

In Brazil, COP30 and the moment of truth

Today, in the Brazilian Amazon, the Belém Summit opens ahead of the 30th United Nations Climate Change Conference (COP30). World leaders convened here in the days leading up to the COP so that we can all commit to acting with the urgency that the climate crisis demands.

If we fail to move beyond speeches into real action, our societies will lose faith not only in the COPs but also in multilateralism and international politics more broadly. That is why I have summoned leaders to the Amazon: to make this the COP of Truth; the moment we demonstrate the seriousness of our shared commitment to the planet.

Humanity has shown its ability to overcome great challenges when it acts together and guided by science. We protected the ozone layer. The global response to the COVID-19 pandemic proved that the world can act decisively when there is courage and political will.

Back to Brazil

Brazil hosted the Earth Summit in 1992. We approved the Conventions on Climate Change, Biological Diversity and Combating Desertification, and adopted principles that defined a new paradigm for preserving our planet and our humanity. Over the past 33 years, these gatherings have produced important agreements and targets for reducing greenhouse gas emissions – from ending deforestation by 2030 to tripling renewable energy use.

More than three decades later, the world has returned to Brazil to confront climate change. It is no coincidence that COP30 takes place in the heart of the Amazon rainforest. This is an opportunity for politicians, diplomats, scientists, activists and journalists to witness the reality of the Amazon.

We want the world to see the true state of the forests, the planet's largest river basin, and the millions of people who live in the region. COPs cannot be mere showcases of good ideas or



Luiz Inácio Lula da Silva

is the President of Brazil

The setting of the Belém Summit – in the Amazon – will help lead the way in effective action to tackle climate change

annual gatherings for negotiators. They must be moments of contact with reality and of effective action to tackle climate change.

To confront this crisis together, we need resources. And we must recognise that the principle of common but differentiated responsibilities remains the non-negotiable foundation of any climate pact.

That is why the Global South demands greater access to resources – not out of charity, but justice. Rich countries have benefited the most from the carbon-based economy. They must now rise to their responsibilities, not only by making commitments but also by honouring their debts.

Brazil is doing its part. In just two years, we have already halved deforestation in the Amazon, showing that concrete climate action is possible.

A move to preserve forests, other measures

In Belém, we will launch an innovative initiative to preserve forests: the Tropical Forests Forever Facility (TFFF). It is innovative because it operates as an investment fund, not a donation mechanism.

The TFFF will reward those who keep their forests standing and those who invest in the fund; a genuine win-win approach to tackling climate change. Leading by example, Brazil has announced a \$1 billion investment in the TFFF, and we expect equally ambitious announcements from other countries.

We also set an example by becoming the second country to present a new Nationally Determined Contribution (NDC). Brazil has committed to reducing its emissions by 59% to 67%, covering all greenhouse gases and all sectors of the economy.

In this spirit, we call on all countries to present equally ambitious NDCs and to implement them effectively.

The energy transition is fundamental to meeting Brazil's NDC. Our energy matrix is among the cleanest in the world, with 88% of our electricity coming from renewable sources. We

lead in biofuels and are advancing in wind, solar and green hydrogen energy.

Redirecting revenues from oil production to finance a just, orderly and equitable energy transition will be essential. Over time, oil companies worldwide, including Brazil's Petrobras, will transform into energy companies, because a growth model based on fossil fuels cannot last.

People must be at the centre of political decisions about climate and the energy transition. We must recognise that the most vulnerable sectors of our society are the most affected by the impacts of climate change, which is why just transition and adaptation plans must aim to combat inequality.

We cannot forget that two billion people lack access to clean technologies and fuels for cooking, and 673 million still live with hunger. In response, we will launch in Belém, a 'Declaration on Hunger, Poverty and Climate'. Our commitment to fight global warming must be directly linked to the fight against hunger.

The need for a climate change council

It is also fundamental that we advance the reform of global governance. Today, multilateralism suffers from the paralysis of the United Nations Security Council. Created to preserve peace, it has failed to prevent wars. It is our duty, therefore, to fight for the reform of this institution.

At COP30, we will advocate the creation of a UN Climate Change Council linked to the General Assembly. It would be a new governance structure with the force and the legitimacy to ensure that countries deliver on their promises, and an effective step toward reversing the current paralysis of the multilateral system.

At every Climate Conference, we hear many promises but see too few real commitments. The era of declarations of good intentions has ended: the time for action plans has arrived. That is why, today, we begin the COP of Truth.

GS. Paper 3 Environment

UPSC Mains Practice Question: Justice, not charity, should define global climate finance. Examine the rationale behind this statement in the context of climate change negotiations and the demand for greater financial access for developing nations. (150 Words)

Context :

As the world gathers for the Belém Summit in Brazil, ahead of the 30th United Nations Climate Change Conference (COP30), President Luiz Inácio Lula da Silva has called it the “COP of Truth.” His appeal underscores the growing urgency for real, measurable climate action rather than rhetorical commitments. With the Amazon rainforest — the “lungs of the planet” as its backdrop, COP30 represents both a symbolic and practical test of global resolve to combat climate change through collective responsibility and climate justice.

Background: COPs and the Climate Challenge

- Since the Earth Summit of 1992 in Rio de Janeiro, where foundational environmental conventions on climate change, biodiversity, and desertification were signed, the world has made incremental progress through successive COPs — from Kyoto Protocol (1997) to Paris Agreement (2015).
- Yet, despite numerous pledges, global emissions continue to rise, deforestation persists, and the 1.5°C target remains at risk. COP30 thus marks a critical juncture: a chance to restore faith in multilateralism and the UN climate framework by transforming commitments into concrete action.

Key Highlights from President Lula’s Address

1. The Call for Realism and Accountability

President Lula emphasized that mere speeches are not enough; the credibility of COPs and global diplomacy depends on tangible outcomes.

- He called for “the COP of Truth” — one that bridges the gap between promises and performance.
- The idea is to rebuild trust among nations and citizens who have grown skeptical of repetitive declarations with little implementation.

2. The Principle of Common but Differentiated Responsibilities (CBDR)

Lula reaffirmed CBDR — a cornerstone of the UNFCCC framework — as non-negotiable.

- The Global South demands greater climate finance and technology access, not as charity but as climate justice.
- Developed nations, having historically benefitted from the carbon-intensive economy, must honor their financial and moral obligations.

This echoes the persistent divide between developed and developing nations that often stalls climate negotiations.

3. Brazil’s Domestic Actions and Leadership

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Brazil, home to nearly 60% of the Amazon rainforest, has positioned itself as a leader in forest conservation and renewable energy.

- Deforestation in the Amazon has been halved in two years — a major turnaround from the previous decade.
- Brazil has also revised its Nationally Determined Contribution (NDC), committing to a 59–67% reduction in emissions, among the most ambitious globally.
- Its energy matrix is already 88% renewable, drawing from hydropower, biofuels, solar, and wind.

These achievements lend credibility to Lula's push for a "just and equitable energy transition."

4. The Tropical Forests Forever Facility (TFFF)

Lula announced the launch of the Tropical Forests Forever Facility (TFFF) — an innovative investment fund model to reward nations and communities that preserve forests.

- Unlike traditional donation mechanisms, the TFFF aims for sustainable financing and mutual benefit: those who conserve forests and those who fund it both gain.
- Brazil has committed \$1 billion to the fund, setting an example for other nations.

This approach reframes conservation as an economic opportunity, not merely a moral responsibility.

5. Linking Climate Action with Poverty and Inequality

President Lula underlined the social dimension of climate action, stating that "people must be at the centre of political decisions."

- Two billion people still lack access to clean cooking fuel, and over 673 million face hunger.
- At Belém, Brazil plans to launch a Declaration on Hunger, Poverty, and Climate, integrating climate justice with human development goals.

This approach aligns with the UN's Sustainable Development Goals (SDGs) and India's own emphasis on "climate justice" and "LiFE – Lifestyle for Environment."

6. Reforming Global Climate Governance

Lula's proposal for a UN Climate Change Council, directly linked to the UN General Assembly, seeks to overcome the paralysis of the current multilateral system.

- The UN Security Council, he argues, has failed to preserve global peace or address cross-border crises such as climate change.
- A dedicated council could provide legitimacy, enforcement power, and accountability for climate commitments — a bold reform idea that could redefine global environmental governance.

Analysis: Why COP30 is a "Moment of Truth"

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Daily News Analysis

of multilateral credibility.

COP30 represents more than another conference; it symbolizes a test

- Global trust deficit: Repeated failures to meet climate finance targets (\$100 billion annually) and weak implementation of NDCs have eroded confidence in COP outcomes.
- Brazil's proactive role: Hosting COP30 in Belém, Amazonia, emphasizes the ground realities of deforestation and livelihood challenges.
- Shift from pledges to mechanisms: Initiatives like the TFFF suggest a pragmatic approach to financing sustainability.
- Integrating justice and equity: The linkage between climate, hunger, and inequality strengthens the moral argument for inclusive development.

However, challenges remain — reconciling national interests, ensuring equitable finance, and navigating geopolitical divides between the Global North and South.

Conclusion

COP30 in Brazil stands at the crossroads of hope and history. President Lula's vision of a "COP of Truth" captures the global sentiment that time for speeches is over — what is needed now is action, accountability, and justice. If world leaders rise to the occasion, COP30 could mark a turning point toward genuine climate solidarity. But if it fails, it risks deepening the crisis of faith in global governance.

As the Amazon breathes for the planet, the world must now breathe new life into its climate commitments, transforming ambition into reality.

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