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INDIA'S NATIONAL NEWSPAPER SINCE 1878

Daily News Analysis

The Hindu Important News Articles & Editorial For UPSC CSE

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Edition : International Table of Contents

Daily News Analysis

Page 06 : GS 3 – Climate Change / Environment /Prelims

India, along with 13 countries and an African regional alliance, has announced the creation of a new **"country platform"** to streamline access to **climate and nature finance** from the **Green Climate Fund (GCF)**. This initiative, unveiled during **COP30** negotiations in Belém, Brazil, aims to overcome longstanding procedural hurdles and improve the disbursal and utilisation of climate finance.

Daily News Analysis

India to spruce up mechanisms for accessing climate finance

A new 'country platform' is expected to help India tap Green Climate Fund resources more easily; the fund has faced criticism from developing countries for its complex disbursal procedures and lack of technical support to avail it

Jacob Koshy
BELEM, BRAZIL

India was among the 13 countries and a regional alliance of African countries that announced plans to set up a national platform for "climate and nature finance" at a ministerial event during the COP30 under way in Belem, Brazil, on Saturday. This would be coordinated through the Green Climate Fund (GCF), an institutional mechanism that has been at work since 2015, to fund projects in developing countries to adapt to unfolding climate change and to invest in clean energy.

Despite being the world's largest institutional mechanism for disbursing funds for climate finance, with commitments worth $19 billion, only a quarter of it has been properly allocated as of 2024. The GCF faces criticism from developing countries that its disbursal mechanisms are often difficult to comply with and there is limited technical support to avail these funds.

A stated goal of the GCF is to ensure that its funds are evenly split between adaptation and mitigation.

The Belem ministerial event, co-hosted by Brazil's Ministry of Finance and the GCF, brought together Ministers and other senior government officials as well as international, national, public, and private climate finance leaders.

The ministerial event on climate finance under way in Belem, Brazil, on Saturday. X/@THEGCF

New 'country platform'

While India already engages with the GCF, it is believed that a new "country platform" for "climate and nature finance" would help the country move away from a "fragmented approach" towards accessing funds.

This is especially significant in a year when calls from developing countries for prioritising adaptation and improving access to climate finance are particularly resonant, especially at the ongoing proceedings of COP30. *The Hindu* reached out to the Environment Ministry for more clarity on the country platform but did not receive a comment until press time.

Halfway through negotiations on Saturday, India was leading developing countries' clamour for a focused discussion and road map on a section of the Paris Agreement called Article 9.1, which mandates that developed countries provide funds for mitigation and adaptation.

The announcement of such a platform also ties in with expectations that negotiators may finalise a list of indicators that can be used to measure progress towards the so-called Global Goal on Adaptation (GGA). Progress on producing an agreed list of indicators has been difficult, with nearly 90 experts working over two years to narrow down a list of almost 10,000 potential indicators to a final set of just 100, which is supposed to be adopted at COP30, according to a report by Molly Lempriere, an analyst for Carbon Brief, an agency that tracks climate negotiations.

However, with India, among other countries expected to announce National Adaptation Plans, there is greater vocal support and interest in having a concrete outcome on the GGA.

Announcing their country and regional platforms, representatives from the African Islands States Climate Commission (AISCC) – Cambodia, Colombia, India, Kazakhstan, Lesotho, Mongolia, Nigeria, Oman, Panama, Rwanda, the Dominican Republic, Togo, and South Africa – shared their vision and strategies for leveraging country platforms to accelerate climate action. This brings the number of platforms to 16, with the previously established Brazil Country Platform and Caribbean Regional Platform, according to a note from the GCF.

GCF support for India

As of August 2024, India has received commitment from the GCF for 11 projects worth $782 million to mitigate and adapt to climate change in sectors, including water, clean energy, coastal, livelihood, transport, medium and small enterprises and climate start-ups. A bulk of the financing is in the form of concessional loans.

India's Environment Ministry is the primary access point (or the Nodal Designated Authority) for GCF-linked funding.

Static Context

1. What is the Green Climate Fund (GCF)?

- Established in **2010** under the **UNFCCC**.

- Aims to support **developing countries** in:
  - mitigation of climate change
  - adaptation to climate impacts
- Commits to mobilising **$100 billion annually** (collective goal by developed nations).
- India has been accessing GCF funds since **2015**.

2. Country Platform — Concept

- A **coordination mechanism** involving national ministries, financial institutions, and international partners.
- Aims to:
  - streamline project proposals
  - integrate national climate priorities
  - reduce fragmentation
  - increase speed and scale of finance inflow

3. Article 9 of Paris Agreement

- Developed countries shall:
  - provide financial support to developing nations
  - report transparently on climate finance
- Emphasises **predictability, transparency, and adequacy**.

Current Context

1. Why is the country platform needed now?

- GCF has **commitments worth $19 billion**, but only **one-fourth** is disbursed.
- Developing countries face:
  - complex application procedures
  - lack of technical support
  - slow disbursal timelines
- India wants to **shift from a fragmented approach** to a **more unified national system** for climate finance.

2. Developments at COP30

- India and 13 nations submitted plans.
- African Island States Climate Commission and many others announced similar platforms.
- The number of global platforms increased to **16**.

3. India's performance

- As of August 2024:
  - India received **$782 million** from GCF.
  - Supports 11 projects covering:
    - renewable energy
    - coastal resilience
    - transport
    - MSMEs
- Majority of funds are **concessional loans**, not grants.

4. Challenges in Global Climate Finance

- Negotiations for the **Global Goal on Adaptation (GGA)** still slow.
- Difficulty in agreeing to **indicators** for tracking adaptation progress.

Significance for India

1. Better access to climate funds

The platform will help:

- fast-track project proposals
- mobilize larger climate finance
- support India's climate goals (NDCs)

2. Reducing dependency on fragmented institutional channels

At present:

- proposals routed through multiple ministries and agencies
- delays in submission and approval

The platform may act as a **central climate finance hub**.

3. Boost to Adaptation Finance

India struggles to get adequate adaptation financing; the platform may:

- help identify priority sectors
- align data and indicators with global processes
- bring in private finance

4. Strengthening India's stand in climate negotiations

A functional platform helps India:

- set an example for other developing nations
- strengthen G77 & China group demands
- press developed nations for predictable, transparent funding

Challenges Ahead

1. **Administrative capacity constraints**
   Coordinating ministries, private sector, and GCF norms is complex.
2. **Technical expertise gaps**
   Many states lack climate finance experts to draft bankable proposals.
3. **Dependence on concessional loans over grants**
   Raises concerns of debt burden.
4. **Slow global negotiations on adaptation indicators**
   Affects India's ability to access large adaptation funds.

Way Forward

1. Strengthen national climate finance architecture

- Build capacity in state departments.
- Train officials on GCF proposal drafting.

2. Promote public–private partnerships

Mobilise private capital for:

- renewable energy
- green hydrogen
- climate-resilient infrastructure

3. Ensure transparency and accurate reporting

- Improve MRV (Monitoring, Reporting, Verification) systems.
- Align with global adaptation indicators for faster approvals.

4. Push for reform in GCF structure

- simplified proposal procedures
- faster disbursal
- more grants for adaptation

Conclusion

The creation of a **country platform** marks a crucial step for India to enhance its access to global climate finance. With climate impacts intensifying and adaptation needs rising, streamlined financial mechanisms are essential. While challenges persist—particularly around technical capacity and slow global negotiations—India's proactive engagement can significantly strengthen its climate resilience and leadership among developing nations.

UPSC Prelims Practice Question

Ques: With reference to the Green Climate Fund (GCF), consider the following statements:

1. **It was established under the UNFCCC to help developing countries in mitigation and adaptation.**
2. **India has been accessing GCF funds since 2015.**
3. **Most of India's GCF funding has come in the form of grants, not concessional loans.**

Which of the statements given above is/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

Daily News Analysis

Ques: **"The creation of country platforms for climate and nature finance can significantly improve developing countries' access to the Green Climate Fund (GCF). However, structural and procedural challenges remain." Discuss. (150 Words)**

Page 07 : GS 3 : Science & Tech / Prelims

A recent study published in *Physical Review Letters* has revealed an unusual phenomenon: **reading a quantum clock consumes far more energy than maintaining it**, overturning classical ideas of time measurement. This finding has deep implications for **quantum thermodynamics, quantum information systems, ultra-precise time-keeping**, and potentially the future of **atomic clocks and quantum technologies**.

The study, involving researchers from Austria, Switzerland, Ireland, Italy, and the U.K., suggests that **extracting time information from a quantum system inherently produces entropy**, making the act of measurement itself costly.

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Surprise: reading a quantum clock can cost more than keeping it ticking

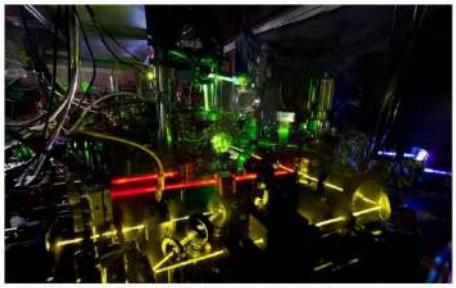
A clock's counter always increases, which aligns with our everyday experience that it ticks forward; the swinging of a pendulum or the vibrations of a quartz crystal are processes that consume energy and produce entropy, driving the clock's hands, but things are not so simple in the quantum world

Vasudevan Mukunth

Time for us is a constant, relentlessly moving forward. The ticking of a clock on the wall, the steady march of seconds on a digital display — they've such familiar concepts that we rarely stop to consider the physical processes that underpin them.

At its heart, any clock is a physical system that evolves in a predictable way, creating a record of the passage of time. Scientists are now exploring what timekeeping means at the smallest possible scale, in the quantum realm, and their findings could home how physicists think about the role of measurement in timekeeping.

A study published in *Physical Review Letters* on November 11 by researchers from Austria, Italy, Ireland, Switzerland, and the U.K. delved into this world by building and studying a quantum clock. The researchers reported a surprising insight in their paper: that the energy cost of simply looking at a clock to read the time could exceed the energy required to make the clock tick in the first place. This discovery, if it's borne out in more research, could have important implications — for the future of ultra-precise timekeeping with devices like optical clocks, as well as for the development of quantum technologies and scientists' grasp of the laws that govern the universe at its most fundamental.



A clock, by its very definition, must be an irreversible device that reliably ticking ahead, unlike a pendulum in a lattice clock shown here, can make that relationship with extreme precision. AFP

Shattered glass

Understanding the researchers' motivation demands first appreciating an important concept from physics called entropy. It's often colloquially described as a measure of disorder. In formal terms, entropy is linked to the second law of thermodynamics, which states that in an isolated system, entropy always tends to increase. This relentless increase is what gives time its arrow, its direction of evolution.

For example, a shattered pane of glass has more entropy than one that's intact, and we will never see the shards spontaneously reassemble. It's this principle of irreversible processes that allows a clock to create a lasting record of the past, distinguishing it from the future. For all practical purposes, a clock's counter always increases, which aligns with our everyday experience that clocks always tick "forward."

At the macroscopic scale of our everyday lives, this is straightforward. The swinging of a pendulum or the vibrations of a quartz crystal are processes that consume energy and produce entropy, driving the clock's hands forward. But in the quantum world, things are not so simple. Quantum systems are governed by probabilities and can exhibit strange behaviours. The amount of entropy produced by quantum processes is generally orders of magnitude lower than in classical processes. This can lead to situations where, due to random fluctuations, a quantum clock might briefly tick "backward."

This presents a conceptual tension. A clock, by its very definition, must be an irreversible device that reliably distinguishes past from future. How can a quantum system, with its inherent randomness and potential for backward steps, function as a true clock?

Ticks of a quantum clock

The authors of the new study hypothesised that the solution lies not just in the clock's internal mechanism, or its clockwork, but in the process of measurement itself. They proposed that the act of extracting information from the quantum system — i.e. observing the ticks to create a classical, readable record — must also produce entropy. This "cost of observation" could be the missing piece that enforces the forward flow of time, even when the quantum clockwork itself is at a standstill, the team figured.

The motivation for the new study was to experimentally test this idea. The team strived to build a quantum clock where they could separately measure the entropy produced by the internal clockwork and the entropy produced by the measurement apparatus. This would allow the researchers to directly compare these two costs and determine which one is more fundamental to the process of timekeeping at the quantum scale. Such an experiment would be the first to explore the interplay between the entropy produced by a microscopic clockwork and its macroscopic measurement apparatus.

To realise their quantum clock, the scientists used a device called a double-quantum dot (DQD). Imagine two minuscule human-made islands in a semiconductor material, so small that they can hold only one extra electron at a time. These are quantum dots. (Their inventors were rewarded with the Nobel Prize for chemistry in 2023.)

By applying precise voltages, the researchers could control the movement of a single electron, causing it to tunnel from a source onto the first dot, then to the second dot, and finally off to a drain. (The demonstration of quantum tunnelling in a logic circuit won the Nobel Prize for physics in 2025.) This sequential movement of an electron constituted a single tick of the team's clock.

Reading the time

The state of the DQD could be in one of three configurations: an excess electron on either dot (which we'll call state 0), an electron on the left dot (state L) or an electron on the right dot (state R). A forward tick is a full cycle, for instance from states 0 to L to R and back to 0, as the electron traversed the dots.

To "read" the time, the researchers needed to know which state the DQD was in at any given moment. They accomplished this using a nearby charge sensor — which was another quantum dot whose electrical properties were sensitive to the location of the electron in the DQD. By measuring the current flowing through this sensor, they could deduce whether the DQD was in state L or R. This measurement process, however, wasn't free. It required energy and therefore produced entropy.

The team used two different methods to read the sensor: a direct sensor (DC) measurement and a more sophisticated radio-frequency (RF) reflectometry technique. This allowed them to vary and precisely measure the power dissipated, and thus the entropy generated, by the act of observation itself. By simultaneously controlling the voltage across the DQD, which dictated the energy dissipated by the clock's tick, they could independently study the thermodynamic costs of both the clockwork and "reading the time."

The interaction between a quantum system and its classical measurement device isn't just a technical detail; it's a central part of the physics involved. The entropy produced by the amplification and measurement of a clock's ticks is the most important and fundamental thermodynamic cost of timekeeping at the quantum scale

Source of irreversibility

The results of the experiment seemed striking. The researchers first examined the relationship between the clock's precision and the entropy produced by its internal workings, i.e. the DQD. As predicted by thermodynamic principles, they found that a more precise clock — one with more regular and forward-moving ticks — required more entropy. When the DQD was brought to equilibrium, where forward and backward ticks were equally likely, the clockwork produced no net entropy, and its ability to record the passage of time vanished.

However, the researchers' most remarkable claim emerged when they analysed the entropy cost of the measurement process. They found that the entropic cost of extracting the classical ticks from the quantum clock was the dominant factor by an astonishing nine orders of magnitude. In other words, the energy dissipated to simply find out what time it was (record the ticks) was billions of times greater than the energy needed to make the clock tick, by a factor of a billion.

The team also showed that the measurement process could effectively retrieve the information that makes the device a clock. This was because even when the internal clockwork was at equilibrium, i.e. producing no entropy, the act of continuously monitoring the DQD created an irreversible, classical record of its state changes. This record, generated at a significant entropic cost by the measurement device, allowed the researchers to estimate the passage of time.

Sure, in your house as well, reading time from the device on the wall gives you the same information that also makes the device's identity a "clock" but here's what's unique about the quantum clock: the team interpreted their results as evidence that in the DQD clock, the dominant source of irreversibility needed for timekeeping comes from the act of observation, not from the clockwork itself.

These findings also reinforce those reported by a different group in 2023 that "reading the clock" is an invasive process in quantum timekeeping that can't be taken for granted. The new study also complicates and deepens the understanding of precision reported in the 2023 study by showing that the effect of measurement isn't more lithe. Instead of "reading the clock more often is better", the new study seems to report a more complex reality: the relationship between measurement strength and precision depends on the clockwork.

Physics of timekeeping

The study's implications could be far-reaching, touching on fundamental physics, metrology (the science of measurement), and the future of quantum computing. Perhaps foremost, it suggests that the oft-ignored interaction between a quantum system and its classical measurement device isn't just a technical detail; it's a central part of the physics involved. The entropy produced by the amplification and measurement of a clock's ticks is the most important and fundamental thermodynamic cost of timekeeping at the quantum scale.

At least one implication is potentially practical: current atomic clocks — which are some of the most accurate timekeeping devices in existence — could be improved by designing more thermodynamically efficient measurement systems. That is, by minimising the entropy cost of observation, it may be possible to create clocks that are even more precise.

The principles the new study has explored are also not limited to clocks. Any quantum computer will depend on being able to precisely control and measure quantum states. Understanding the thermodynamic costs associated with extracting information from a quantum system is crucial for engineers to design efficient and scalable quantum machines. The authors' approach feeds into a broader line of work on the energy cost of quantum measurements, which may eventually inform how engineers design quantum computers.

Finally, some physicists interpret such results as suggesting that the clear, unidirectional flow of time that we experience may not be solely a property of the microscopic world itself. Instead, it could be a feature that emerges anew from the process of extracting and recording information on a macroscopic scale.

In the classical proverb, a watched pot never boils. In these quantum clock experiments, the pot certainly boils, but taking its bubbles into a reliable stopwatch turns out to be costly.

A quantum dot is a crystal that often consists of just a few thousand atoms. In terms of size, it has the same relationship to a football as a football has to the size of the Earth

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Static Context

1. What is a Quantum Clock?

- A device whose timekeeping is based on **quantum mechanical states** (like electron tunnelling, atomic transitions).

- Unlike classical clocks (pendulum, quartz crystal), a quantum clock is:
  - governed by **probabilistic behaviour**
  - susceptible to **random backward fluctuations**
  - sensitive to **measurement-induced disturbances**

2. Second Law of Thermodynamics

- Entropy of an isolated system **never decreases**.
- This gives **direction to time** (the "arrow of time").

Quantum systems, however, can show local decreases or reversals temporarily.

3. Measurement in Quantum Mechanics

- According to the **observer effect**, measuring a quantum system:
  - affects its state
  - may introduce decoherence
  - imposes thermodynamic costs (Landauer's principle)

4. Landauer's Principle

- *Information processing has a minimum thermodynamic energy cost.*
- Erasing or observing information generates entropy.

This principle underlies why observing a quantum clock costs energy.

Current Context

1. The Central Finding

- **Reading** the quantum clock (extracting time information)
  consumes **orders of magnitude more energy**
  than **keeping the quantum clock ticking**.

2. What Researchers Did

- Built a quantum clock using:
  - a **double quantum dot (DQD)**
  - electron tunnelling events
  - nearby quantum sensors
- Measured time by observing changes in the electron's position.

3. Key Observation

- Extracting classical information from the clock:
  - required **continuous observation**
  - produced **significant entropy**
  - caused energy dissipation far greater than the clock's own operational energy

Thus, **the cost of measurement dominates** over the cost of running the system.

4. Why This Happens

- Quantum systems are in **probabilistic states**.
- The clock's internal evolution doesn't produce entropy if unobserved.
- But to know the time, one must:
  - extract classical information
  - stabilize the system
  - pay the thermodynamic "cost of information"

5. Implications for Timekeeping

- At ultra-small scales, **the act of reading time is more expensive than time's evolution itself**.
- This insight challenges the classical assumption that:

"reading a clock is trivial compared to running it."

Significance for Science & Technology

1. Quantum Technologies

This research impacts:

- quantum computing
- quantum communication
- ultra-precise sensors
- next-generation atomic clocks

2. Ultra-precise Timekeeping

- Modern technologies rely on precise clocks (GPS, telecom, high-frequency trading).
- Quantum clocks could revolutionise precision, but:
  - measurement limits accuracy

- energy costs may constrain miniaturisation

3. Thermodynamic Cost of Information

- Supports the idea that **information has physical cost**.
- Strengthens the bridge between:
  - quantum information theory
  - thermodynamics
  - statistical mechanics

Challenges Highlighted

1. Measurement Back-action

- Reading a quantum clock can disturb it.

2. Entropy Generation

- Measurement produces entropy even if clock evolution doesn't.

3. Energy Inefficiency

- Extracting readable classical data is highly energy-intensive.

4. Scalability Issues

- Practical quantum clocks must minimise:
  - decoherence
  - thermodynamic overheads

Conclusion

The study reveals a counterintuitive truth: in the quantum world, **information itself has a cost**, and reading a quantum clock requires more energy than maintaining it.
This discovery deepens our understanding of **quantum measurement, entropy, and time** while also shaping the future of **precision timekeeping and quantum technologies**.
As nations—including India through the National Quantum Mission—push toward quantum supremacy, such findings will play a pivotal role in designing efficient, scalable quantum systems.

Daily News Analysis

UPSC Prelims Practice Question

Ques : **Consider the following statements about Quantum Clocks:**

1. Their functioning is based on classical oscillations like quartz vibrations.
2. Measuring their time requires extracting information from quantum states.
3. The process of measurement in a quantum clock can generate entropy.

Which of the above statements is/are correct?

A. 1 only
B. 2 and 3 only
C. 1 and 2 only
D. 1, 2 and 3

Ansr: B

UPSC Mains Practice Question

Ques : The discovery that extracting time information from a quantum clock costs more energy than keeping it running challenges classical notions of timekeeping. Discuss the scientific significance of this finding and its implications for quantum technologies." (250 words)

Daily News Analysis

Page : 08 : GS 3 : Environment & Ecology / Prelims

Every winter, Delhi plunges into a severe air-quality crisis, with AQI routinely crossing **400+ ("severe")**, forcing school closures, flight delays, and severe public health impacts. The article argues that Delhi's air pollution is a **"wicked problem"** — a complex, multi-dimensional challenge with no simple solution, requiring **bold policy interventions**, inter-State coordination, and citizen participation.

This recurring crisis highlights a structural failure rather than a seasonal inconvenience.

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Delhi's air, a 'wicked problem' in need of bold solutions

Shashi Tharoor
is a fourth-term Member of Parliament (Lok Sabha, Thiruvananthapuram) from the Indian National Congress, and the author of 27 books, mainly about modern India

Each winter, as Delhi wakes under a grey sky and the air thickens with smoke, the city relives a familiar crisis. Schools close, flights are delayed, and citizens scramble for masks as the Air Quality Index (AQI) routinely breaches 400 – the "severe" mark. Deepavali prompts a fresh round of breast-beating as the spate of firecrackers adds more smoke and pollutants to the already-unbreathable air. But this is not a seasonal inconvenience; it is a chronic public health emergency. And yet, year after year, we treat it as a passing nuisance rather than a structural failure.

Since 2015, I have personally convened and conducted an annual Round Table on Clean Air with different stakeholders – public health experts, environmentalists, science journalists, Members of Parliament, and even Ministers. Every year I seek different institutional partners and a wider circle of attendees in the hope of enlarging the number of those determined to do something about the air we breathe. Yet, little seems to move.

The consequences of breathing the national capital's foul air are devastating. Long-term exposure to Delhi's toxic air can reduce life expectancy by up to 10 years, especially in areas with consistently high $PM_{2.5}$ levels. There is a sharp rise in asthma, bronchitis, chronic obstructive pulmonary disease (COPD), and lung infections, particularly during winter months. Fine particulate matter ($PM_{2.5}$) penetrates the bloodstream, increasing the risk of heart attacks, strokes and hypertension in Delhi residents, and prolonged exposure to airborne toxins is linked to lung damage due to oxidative stress and DNA damage. Air pollution has even been associated with cognitive decline, depression and anxiety, especially in children and the elderly, as well as to rheumatoid arthritis, lupus and multiple sclerosis, due to systemic inflammation and auto-immune disruptions. People are relocating from Delhi, even at the cost of their careers, in order to avoid exposing their families and themselves to such risks.

The complexity of Delhi's problem

Air pollution costs India an estimated 1.36% of its GDP annually – roughly $36.8 billion – due to health-care expenses, lost productivity and premature deaths. Delhi's reputation as one of the world's most polluted cities deters international tourists and investors. And yet, resources are being diverted to emergency responses (such as cloud-seeding to precipitate rain, and domestic air purifiers, including for government offices), rather than investing in long-term sustainable solutions.

Delhi's air pollution is not born of a single source. It is the sum of many small catastrophes – geographical, meteorological, and man-made – that together create a toxic haze. To solve it, we must first understand its complexity. Delhi's geography itself is a liability. The city lies in a basin-like formation, flanked by the Aravalli hills, which restrict air flow and prevent pollutants from dispersing easily. During October to January, high-pressure systems settle over northern India, leading to temperature inversion – a phenomenon where cooler air near the surface is trapped beneath warmer air above. This inversion, coupled with low wind speeds, locks pollutants close to the ground, turning Delhi into a bowl of poison. This meteorological trap is not unique to Delhi. Cities such as Los Angeles, surrounded by mountains, have faced similar challenges. But they responded with aggressive policy, technological innovation and public engagement. Delhi must do the same.

In Delhi's case, the natural disadvantages are compounded by human negligence. Delhi NCR has over 3.3 crore registered vehicles. Diesel trucks, two-wheelers, and ageing buses spew nitrogen oxides and $PM_{2.5}$ particles into the air. Despite BS-VI (Bharat Stage 6) norms, enforcement remains patchy. Rapid urbanisation has also led to unregulated construction, with debris and dust contributing nearly 27% of $PM_{2.5}$ levels. Covering sites and enforcing dust-control norms are routinely ignored. Factories and power plants in neighbouring States release sulphur dioxide and other toxins. Many still use outdated technologies and lack emission filters.

And then there are the well-known villains everyone likes to blame. Stubble-burning is a hardy perennial: each autumn, farmers in Punjab and Haryana burn crop residue, sending plumes of smoke into Delhi's skies. Despite court orders and subsidies for alternatives, the practice persists due to economic constraints and a lack of viable machinery. Deepavali celebrations and open waste burning add short-term but severe spikes in pollution. Even "green crackers" have proven ineffective when used en masse.

Delhi's air crisis is a textbook example of a "wicked problem" – a challenge too complex, cross-cutting, and politically fraught for any single solution. The causes are interlinked, the stakeholders are fragmented, and the consequences are unevenly distributed.

Global measures to emulate

But this year presents a unique opportunity. For the first time, Delhi and its neighbouring NCR States – Haryana, Uttar Pradesh, Rajasthan – are governed by the same political party, the Bharatiya Janata Party. This alignment can end years of intergovernmental friction and enable a joint Clean Air Mission, backed by scientific expertise and empowered implementation and driven by the central government – which is from the same party. For an actionable plan, the three States need look no farther than those places that have resolved very similar problems successfully in the not-too-distant past. London, once known for its notorious "pea-souper" smog, introduced an Ultra Low Emission Zone (ULEZ), charging polluting vehicles and incentivising electric mobility. It also invested in green public transport and retrofitted buildings for energy efficiency. Los Angeles overcame its smog crisis through strict vehicle emission standards, clean fuel technologies, and regional coordination across counties. The worst was Beijing, once infamous for its "airpocalypse,", where on a visit, two decades ago, I literally could not see out of my hotel window, so thick was the smog. It implemented a multi-year action plan: relocating polluting industries, banning coal in urban areas, and deploying real-time air monitoring. The result: a 35% drop in $PM_{2.5}$ levels over five years.

Delhi must adopt similar measures – not as isolated experiments, but as part of a sustained, science-led strategy. Delhi urgently needs a Unified Airshed Management Plan that treats Delhi NCR as a single pollution zone. The three States must pool resources, align regulations, and coordinate enforcement across their borders. This must be accompanied by real-time monitoring and public "dashboards" announcing figures and achievements. Transparency builds trust. Citizens must know what they are breathing – and what is being done about it. We must also incentivise EV adoption, electrify public transport, expand metro networks, and deploy electric buses, to reduce reliance on private fuel-burning vehicles. With political will, it should not be impossible to regulate construction and waste: enforce dust-control norms, ban open waste burning, and penalise violators. True, farmers will need to be supported with alternatives: governments must scale up access to Happy Seeders and bio-decomposers, to make stubble management economically viable.

A behavioural issue

Citizen engagement is key. Pollution is not just a governance issue – it is a behavioural one. Campaigns, school programmes, and community initiatives must make clean air a shared responsibility. The persistence of Delhi's air pollution is not an act of nature. It is a consequence of choices – and a reflection of priorities. If we continue to treat it as a seasonal inconvenience, with headlines every Deepavali and inaction thereafter, we will condemn millions to chronic illness, economic loss, and environmental degradation.

But if we act, with urgency, coordination and courage, we can rewrite the narrative. Delhi can breathe again. The question is not whether we know what to do. It is whether we will do it.

Delhi can breathe cleaner air again if its citizens act with urgency, coordination and courage, and follow a sustained and science-led strategy

Static Context

1. What is Air Pollution?

Air pollution refers to the presence of harmful substances in the air — particulate matter ($PM_{2.5}$, PM_{10}), NOx, SO_2, ozone, hydrocarbons, etc.

2. Key Pollutants

- **$PM_{2.5}$** → fine particles <2.5 microns; penetrate lungs, bloodstream

- **PM_{10}** → coarse particles
- **NO_2**, **SO_2**, **CO**, **Ozone**

3. AQI (Air Quality Index)

- Measures air pollution levels on a scale of 0–500
- 400+ = **Severe**, hazardous for all

4. "Wicked Problem"

A term used in public policy to describe:

- multi-dimensional issues
- no clear solution
- interconnected causes
- require long-term systemic response

Air pollution fits this definition perfectly.

5. Regulatory Bodies

- **CPCB**
- **EPCA (now dissolved)**
- **CAQM (Commission for Air Quality Management)**
- **NCR Pollution Control Boards**

Current Context (From the Article)

1. Why Delhi's Pollution is Persistent

- A combination of **geographical**, **meteorological**, and **anthropogenic** factors
- Surrounded by **Aravallis** → **blocked airflow**
- Winter **temperature inversion** traps pollutants
- 3.3 crore registered vehicles
- Industrial emissions, construction dust
- Biomass burning & stubble burning (Punjab & Haryana)
- Firecrackers
- Outdated industrial technologies
- Poor enforcement of existing laws

2. Health Impacts Highlighted

- Life expectancy reduction by **up to 10 years**
- Rise in asthma, COPD, bronchitis
- Heart attacks, stroke, hypertension
- DNA damage & oxidative stress
- Mental health impacts → anxiety, depression
- Children & elderly most affected

3. Governance Failures Identified

- Fragmented responsibilities (Delhi govt, Haryana, Punjab, Centre, CAQM)
- Delayed execution
- Policy confusion during winter surge
- Lack of long-term structural planning

4. Socio-economic Issues

- Farmers burn stubble due to economic constraints
- Migrants, poor workers disproportionately harmed
- Health costs rising
- People relocating to other cities

Analysis — Why is Delhi's Air a "Wicked Problem"?

1. Multi-Causal

- Vehicles, industry, construction, dust, waste burning, stubble burning, thermal plants

2. Multi-Level Governance

- Centre, Delhi govt, UP, Haryana, Punjab → conflicting priorities

3. Seasonal Meteorological Traps

- Temperature inversion, low wind speeds, cold air, basin-like topography

4. Socio-Economic Constraints

- Farmers dependent on crop cycles
- Urban poor exposed to maximum pollution

5. Behavioural Dimensions

- People use firecrackers
- High private vehicle dependence
- Weak compliance

6. Inadequate Enforcement

- Rules exist → weak implementation
- Industries use outdated tech

Key Solutions Highlighted in the Article

1. Inter-State Collaboration (Crucial)

- Delhi cannot solve pollution alone
- Coordinated efforts with Punjab, Haryana, UP

2. Long-Term Structural Measures

- Reduce vehicle dependence
- Improve public transport
- Ultra Low Emission Zones (London model)

3. Stubble Management

- Promote **Happy Seeder**, **Pusa bio-decomposer**
- Provide MSP-linked incentives
- Set up decentralised machinery banks
- Penalize burning AND reward alternatives

4. Industry Reforms

- Ban dirty fuels
- Enforce emissions standards
- Shift to renewable energy
- Upgrade old power plants
- Strict enforcement at borders

5. Construction Dust Control

- Real-time monitoring
- Hefty fines
- Green construction norms

6. Behavioural Solutions

- Awareness + citizen participation
- Curb firecracker use
- Encourage shared mobility

7. Technological Measures

- Smog towers (limited effect)
- Remote sensing & satellite monitoring of stubble burning
- AI-based traffic management

Challenges to Clean Air Action

- Lack of political will
- Short-termism: actions taken only during winter
- Weak enforcement
- Farmers' livelihood constraints
- Poor accountability
- Fragmented governance
- Public apathy
- Rapid urbanisation

Conclusion

Delhi's air pollution is a **chronic structural crisis** requiring bold, long-term, multi-level intervention rather than seasonal firefighting. As the article emphasises, it is a **"wicked problem"** shaped by geography, weather, economic pressures, and governance failures. Only a coordinated, multi-State, multi-sectoral strategy—combined with strong

political will, technological innovation, and behavioural change—can bring sustainable improvements. Clean air must be treated not as a luxury, but as a fundamental right and a shared responsibility.

UPSC Prelims Practice Question

Ques : 'Temperature inversion' often leads to:

A. Enhanced vertical mixing of air
B. Increased dispersion of pollutants
C. Trapping of pollutants near the surface
D. Higher humidity levels in lower troposphere

Ansr: C

UPSC Mains Practice Question

Ques : Delhi's recurring winter air pollution has been described as a "wicked problem" involving complex socio-economic, technological and governance challenges. Analyse.

Daily News Analysis

In news : GS 2 : Governance & Polity

Digital Personal Data Protection Act (DPDP Act), 2023, and the draft DPDP Rules, 2025 together mark India's first comprehensive legal framework for data protection. As India becomes one of the world's largest digital economies, issues of privacy, surveillance, data misuse, and transparency have gained urgency.
The recently notified DPDP Rules, 2025 and amendments to the **Right to Information (RTI) Act, 2005** have triggered concerns around citizen rights, government accountability, and the balance between privacy and transparency.

Daily News Analysis

What are Digital Personal Data Protection Rules?

Has the Data Protection Board of India already been formed? Who are data fiduciaries and data principals? How does the DPDP Act aim to protect children? How has the Right to Information Act, 2005 been amended? What has the Mazdoor Kisan Shakti Sangathan said?

EXPLAINER

Aroon Deep

The story so far:

The Digital Personal Data Protection Rules (DPDP), 2025 were notified this week, kicking off the formation of the Data Protection Board of India (DPBI), and the legal framework for safeguarding the data of Indians online. The DPDP Act itself was passed in Parliament in August 2023, and the draft of the Rules that were notified on November 14, 2025 were released for consultation in January.

What do the DPDP Act and Rules do?

The DPDP Act, 2023 is India's data protection law just as other major countries have their own data protection regimes such as that in Europe (the General Data Protection Regulation (GDPR)) and Singapore (Personal Data Protection Act, 2012). Like these regimes, the Act sets out some baselines for how companies ("data fiduciaries") should handle data of their users in India ("data principals"). For instance, there must be access control and encryption, along with security audits for large firms ("significant data fiduciaries").

Further, data principals are required to take "informed" consent from their users, and anyone whose data they collect, by giving a summary of what data they are collecting, and how they will use it. The Act also gives users the right to erase or modify data they provide to firms, or to delete it. After a specified period of inactivity, firms are under an obligation to delete the data they have on users. A Data Protection Officer (DPO) has to be appointed by large firms, who will oversee compliance.

The Act also restricts targeted advertising and certain data collection from children. The Rules carve out an exemption here for parents tracking their children's location.

ISTOCKPHOTO

To allow users to exercise rights across a variety of fiduciaries (accounts over several platforms), the Act and Rules set out the framework for a "Consent Manager," a service that will allow users to manage their data across several fiduciaries, similar to the permissions manager settings on a smartphone.

Data breaches must be reported as soon as possible, the Act says.

Fines for non-compliance for different parts of the law range from ₹10,000 to ₹250 crore.

Are these requirements in force?

No. While over two years have gone by since the Act was notified, the Ministry of Electronics and Information Technology (MeitY) has chosen to give firms up to 18 more months to comply. Some requirements, like having a DPO be appointed for large firms, goes into effect one year from now.

However, some parts of the Act have kicked into action – such as the DPBI's formation. The DPBI will oversee the Act's implementation and will be a subordinate office of the MeitY. The body will have four members.

Another part of the Act that goes live is the amendment to the Right to Information Act, 2005, which has been furiously resisted by digital rights and transparency groups alike.

Why is the amendment controversial?

The 2023 Act amended Section 8(1)(j) of the Right to Information Act, 2005, which allows citizens to request public information from government bodies. That section allowed government bodies to refuse requests for "personal information", but said that this exemption would not apply if there was a larger public interest in disclosing the information.

The DPDP Act removed that carve-out, allowing government organisations more discretion in what is and isn't personal information, and decline it even if doing so would be in the public interest. The 2023 law was not going to be in force – including this amendment – until the Union government notified it. Transparency activists, such as those belonging to the Mazdoor Kisan Shakti Sangathan (MKSS) and the National Campaign for the People's Right to Information (NCPRI), spent years (since the DPDP Act's 2022 draft was published) resisting this change.

But on Friday, the government disregarded that pushback, and specifically invoked its power to push the amendment through in the form of a notification. Another amendment, to the Information Technology Act, 2000, is not yet in force.

Organisations like the MKSS have worked with grassroots movements to get access to ration "muster rolls" and work order logbooks, allowing them to scrutinise public records for signs of graft and misspending. By implementing a broader definition to what constitutes as "personal information", they have argued, citizens may have no room to conduct such social audits. The amendment could also be used to shield powerful officials' misconduct, they have said. Nikhil Dey, an MKSS founding member, vowed that "'[w]e the people' will fight back" after the amendment went into force.

THE GIST

- The DPDP Act, 2023 is India's data protection law just as other major countries have their own data protection regimes.
- Data principals are required to take "informed" consent from their users, and anyone whose data they collect, by giving a summary of what data they are collecting, and how they will use it.
- The 2023 Act amended Section 8(1)(j) of the Right to Information Act, 2005, which allows citizens to request public information from government bodies.

CURRENT CONTEXT

1. DPDP Act, 2023 – Key Features

- India's first standalone data protection law (like GDPR of EU, Singapore PDPA 2012).
- Regulates how *data fiduciaries* (companies/government bodies collecting data) handle information of *data principals* (users).
- Mandatory **consent**, **notice**, **data minimization**, **purpose limitation**.
- Obligates encryption and security safeguards.
- Provides rights to users:
    - Right to access and correct their data
    - Right to erase
    - Right to grievance redressal

Daily News Analysis

2. DPDP Rules, 2025 – What They Seek to Operationalize

A. Consent and Data Rights

- Data fiduciaries must clearly disclose:
  - What data they collect
  - Why they collect it
  - How it will be used
- Users can withdraw consent at any time.
- Users can demand deletion/modification of their data.

B. Data Protection Board of India (DPBI)

- Functions like an adjudicatory body.
- Handles:
  - Breach notifications
  - Penalty decisions
  - Compliance oversight
- Though the Act was notified in 2023, the **Board is only now being set up**.

C. Penalties

- Fines can range from **₹10,000 to ₹250 crore** depending on severity and non-compliance.

D. Enforcement Timeline

- Firms get **up to 18 months** to fully comply with all technical and organisational requirements.

3. Amendment to RTI Act – Why Controversial?

The government notified an amendment to **Section 8(1)(j)** of RTI Act, 2005.

Earlier provision:

- Personal information could be withheld **only if**:
  - It had no public interest
- RTI allowed disclosure of personal data **when public interest > privacy**.

New change by DPDP Act:

- Removes the "public interest override".

- Makes it easier for public authorities to deny personal information requests **even if public interest is high**.

Concerns raised by MKSS, NCPRI, activists:

- Hampers ability to conduct public audits.
- Makes it harder to expose corruption or misgovernance.
- Could allow misuse to shield wrongdoing under the guise of "protection of personal data".

Example:

RTI activists use personal details like muster rolls, job records, land allotment lists, etc., to detect corruption. These may now be withheld.

4. Why is the amendment being criticised?

- Weakens transparency and public accountability.
- Facilitates bureaucratic secrecy.
- Could reduce the effectiveness of RTI — one of India's strongest tools against corruption.
- Contradiction: **Government exempt from major obligations of DPDP Act**, while private firms face stricter compliance.

5. Why is the DPDP Act important for India?

Opportunities

- Boosts trust in India's digital economy.
- Aligns India with global data protection norms.
- Essential for cross-border data flows with EU, US.
- Strengthens user control over personal data.

Challenges

- Government exemptions dilute privacy.
- Weak independence of Data Protection Board.
- Tension between privacy and transparency (RTI).
- Implementation capacity of SMEs is low.
- Limited data literacy among citizens.

STATIC CONTEXT FOR UPSC

Historical Background

Daily News Analysis

- Based on the **Puttaswamy Judgment (2017)** → Privacy is a Fundamental Right under **Article 21**.
- Justice Srikrishna Committee (2018) gave first draft Data Protection Bill.
- Several versions introduced (2019, 2021) → finally passed in 2023.

CONCLUSION

The Digital Personal Data Protection Rules, 2025 mark a major leap in India's data governance framework. While they strengthen user rights, promote responsible data use, and enable India's digital economy to integrate with global standards, the controversial amendment to the RTI Act raises serious concerns about transparency and democratic accountability.
The challenge before the government is to balance **privacy, transparency, and innovation** while maintaining citizens' trust in the digital State. A robust, independent, and accountable data protection ecosystem is essential for India's digital future.

UPSC Mains Practice Question

Ques: Q. "The Digital Personal Data Protection Act, 2023 attempts to balance individual privacy with the needs of a growing digital economy. However, exemptions to the State and the amendments to the RTI Act undermine this balance." Discuss. (150 Words)

Daily News Analysis

In news : Prelims

India is one of the world's largest producers of fruits, vegetables, cereals, spices, marine products, and processed foods. While global demand for Indian agricultural goods is rising, **persistent port-related inefficiencies**—high handling costs, weak cold-chain infrastructure, delays, and inadequate storage—are eroding export competitiveness and reducing returns for farmers, processors, and exporters.

India's goal of becoming a **global agricultural export hub** cannot be achieved without modern, efficient, and technology-driven ports.

How ports can 'ferry' India's agri export ambition

Parashram Patil

Indian fruits, vegetables, spices, cereals, processed foods, meat and marine products reach markets across Asia, Europe, West Asia, and North America.

However, persistent port-related inefficiencies weaken the country's export competitiveness and erode value for farmers, processors and allied industries.

After all, only 10-20% of India's agri export is sent as air cargo; more than 80% goes through its ports.

If India is to widen its global agricultural footprint and enable the sector to contribute meaningfully to achieve its targeted $5 trillion economy, ports must evolve into fully efficient, technology-enabled and future-ready trade gateways. Field assessments at ports such as Visakhapatnam, Kandla, JNPT and JSW highlight recurring challenges that function as a hidden export tax. Cargo contamination – arising from outdated handling practices, inadequate fumigation and weak quality control – continues to undermine India's credibility in quality-sensitive markets. Perishables, especially horticultural produce, face heightened spoilage risk due to prolonged berthing delays and the absence of dedicated agri-berths.

Steep costs: At Visakhapatnam, handling charges are significantly higher than in neighbouring ports. FILE PHOTO

The warehousing deficit further compounds these constraints. Many ports depend on storage facilities located more than 15 km from their terminals, inflating first-mile costs and extending transit time. Cold-chain capacities remain inadequate, while warehouse rentals are often uncompetitive for agri-exporters. At Visakhapatnam, handling charges are significantly higher than in neighbouring ports such as Kakinada and Gangavaram. The prolonged shortage of rake-siding labour and surveyors during extended operations has led to demurrage penalties and operational delays.

Untapped advantage

Ports such as Visakhapatnam and JSW enjoy proximity to some of India's most productive agricultural belts. Andhra Pradesh, Maharashtra, Karnataka and Tamil Nadu collectively supply rice, banana, onion, spices, grapes, mango, marine products and processed foods – commodities with a strong and expanding global demand. Simultaneously, India's growing import needs – raw cashew, pulses, edible oils, cocoa products and natural rubber – require ports that can efficiently handle two-way agricultural trade flows. With the right investments in infrastructure modernisation, cold-chain systems and seamless hinterland connectivity, ports can serve as the bedrock of a resilient and high-value agricultural export ecosystem.

Transforming ports into globally competitive agri-trade gateways requires a targeted reform agenda

Investments in pre-cooling, irradiation, hot-water treatment and temperature-controlled storage can cut post-harvest losses by 30-40%.

Infrastructure grants under the Agricultural and Processed Food Products Export Development Authority (APEDA), the National Horticulture Board and PM Kisan Sampada Yojana can accelerate the development of modern export facilities.

Agencies such as Plant Quarantine, Food Safety and Standards Authority of India (FSSAI), National Plant Protection Organisation (NPPO), and customs must operate within port premises to reduce procedural delays.

(The writer is an agricultural economist)

CURRENT CONTEXT

1. India's Agri Export Dependence on Ports

- Only **10–20%** of agri exports go by air;
- **80%+** depends on seaports, making port efficiency crucial.

2. Key Structural Problems at Indian Ports Affecting Agri Exports

A. High Handling Charges

- At **Visakhapatnam**, handling charges are significantly higher than neighbouring ports (Kakinada, Gangavaram).
- Acts like a **"hidden export tax"**.

B. Cargo Contamination & Quality Loss

- Outdated handling practices
- Poor mechanisation
- Inadequate quality standards
- Particularly harmful for perishables like fruits & vegetables.

C. Storage & Cold-chain Deficiencies

- Many ports depend on facilities **more than 15 km away** → high first-mile costs.
- Cold-chain remains inadequate; warehouse rentals often uncompetitive.
- Delays increase spoilage risk for horticultural produce.

D. Shortage of Manpower & Surveyors

- Shortage of rake-siding labour and surveyors causes:
    - Delays in operations
    - Demurrage penalties
    - Reduced export credibility in quality-sensitive markets

3. Untapped Advantages of Some Ports

Ports like **Visakhapatnam, JSW** are close to major agri belts:

- Andhra Pradesh

- Maharashtra
- Karnataka
- Tamil Nadu

These states supply:

- Rice, banana, mango, onion, spices
- Marine products
- Processed food commodities

India's **growing import needs**—edible oils, pulses, natural rubber—also demand efficient two-way agricultural trade handling.

4. Needed Reforms for Port-Led Agri Export Growth

A. Strengthen Cold-chain Infrastructure

- Investments in:
    - Pre-cooling
    - Hot-water treatment
    - Irradiation
    - Temperature-controlled storage
      → Can reduce post-harvest losses by **30–40%**.

B. Infrastructure Grants

- Leverage schemes like:
    - **APEDA**
    - **National Horticulture Board**
    - **PM Kisan Sampada Yojana**
      → To build modern export facilities.

C. Improve Inter-Agency Coordination

- Key agencies that must work seamlessly:
    - Plant Quarantine
    - FSSAI
    - NPPO (National Plant Protection Organisation)
    - Customs
      → To reduce procedural delays.

D. Technology Adoption

- RFID tracking
- End-to-end digital documentation
- Predictive analytics for logistics
- Blockchain for traceability

E. Dedicated Agri-Berths

- Helps avoid berthing delays.
- Reduce contamination risks.

F. Reforms in Port Governance

- Modernisation of:
    - Handling equipment
    - Warehousing
    - Cold storage
    - Last-mile connectivity
- Promote **PPP** for port infra.

Daily News Analysis

STATIC CONTEXT

APEDA (1985)

- Under Ministry of Commerce.
- Promotes export of scheduled agricultural & processed commodities.
- Provides infrastructure support, certification, branding.

FSSAI

- Ensures food safety standards for exports.

NPPO

- Issues phytosanitary certificates required for export of plants/plant products.

Sagarmala Programme

- Aims to modernise ports, improve connectivity, reduce logistics costs.

Logistics Performance Index (LPI)

- India still ranks low in:
    - Timeliness
    - Infrastructure
    - Customs clearance

Warehousing (WDRA)

- Ensures scientific storage; still gaps exist.

CONCLUSION

For India to increase its agriculture export footprint and achieve its ambition of a **$5 trillion economy**, ports must evolve into **efficient, technology-enabled and future-ready trade gateways**.
Modernisation of port infrastructure, better cold-chain capacity, reduced handling charges, improved governance, and seamless coordination among regulatory agencies are essential.

A well-functioning port ecosystem will not only enhance export competitiveness but also ensure higher value realisation for millions of Indian farmers and agri enterprises.

UPSC Prelims Practice Question

With reference to India's agricultural exports, consider the following statements:

1. More than 80% of India's agri-exports are shipped through seaports.
2. Only around 10–20% of agri-exports use air cargo.
3. Ports such as Visakhapatnam and JSW are located close to major agricultural production belts.

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: (d) 1, 2 and 3

Page : 08 Editorial Analysis

THE HINDU
INDIA'S NATIONAL NEWSPAPER SINCE 1878

Daily News Analysis

The POCSO Act is gender-neutral by design

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The Supreme Court of India recently issued notice on a petition arising from a case in which a woman stands accused of 'penetrative sexual assault' against a minor boy, an offence defined in Section 3 of the Protection of Children from Sexual Offences (POCSO) Act, 2012.

The petitioner has claimed that this provision is gender-specific, i.e., it applies only to male perpetrators and, hence, cannot apply to her. Its final outcome notwithstanding, the petition raises a question that is foundational to the scope of India's child sexual abuse law: can women be prosecuted for an offence under this provision?

The text supports gender neutrality

Going by available evidence, the answer seems to be in the affirmative. The POCSO Act is gender-neutral, qua both perpetrators and victims, for three reasons. First, if interpreted properly, the text of the Act does not restrict its application to male offenders.

The petitioner has argued that Section 3 is gender-neutral because it uses the pronoun 'he' for the perpetrator.

However, Section 13(1) of the General Clauses (GC) Act, 1897, states, 'words importing the masculine gender shall be taken to include females'. Since the GC Act lays down rules and definitions to aid statutory interpretation, Section 13(1) implies that unless the contrary is explicitly stated in, or appears from the context of the POCSO Act, 'he' includes 'she'.

This interpretation is reinforced by the definition of penetrative sexual assault in Section 3 of the POCSO Act. It encompasses acts beyond penile penetration, such as digital or object penetration, or oral penetration, which can be committed by female perpetrators as well.

The Protection of Children from Sexual Offences Act must be read as it was legislatively intended

The provision also covers situations where a person makes a child perform any of the listed penetrative acts with themselves or even with a third person, further underscoring its gender-neutral scope.

A deliberate legislative choice

Second, reliable official sources confirm the legislative intent of keeping the POCSO Act gender-neutral. For instance, the Ministry of Women and Child Development, Government of India in a written response to a question in the Lok Sabha, dated December 20, 2024, stated unambiguously that POCSO 'is a gender neutral Act'. Similarly, when the Protection of Children from Sexual Offences (Amendment) Bill, 2019 was tabled in the Lok Sabha, its 'Statement of Objects and Reasons' also specified that the POCSO Act was 'gender neutral'.

Nevertheless, it may be possible to argue that gender-neutrality here is only meant to apply to the minor victims of sexual offences (i.e., boys and girls under the age of 18 years), but not to the perpetrator. This is especially because one of the written answers of the Ministry of Women and Child Development, dated February 7, 2019, to a question raised in the Rajya Sabha, was that the POCSO Act 'covers sexual abuse of boys also as it is a gender-neutral Act'.

However, such a reading would misrepresent the legislative intent. Consider the provision on 'rape', found in Section 63 of the Bharatiya Nyaya Sanhita (BNS), 2023 (the erstwhile Section 375 of the Indian Penal Code, 1860). It specifies that 'a man' commits rape if he commits certain forms of penetrative sexual acts against 'a woman'.

This is clearly a gender-specific provision which envisages that only women may be victims of rape and only men may be perpetrators of rape. If Parliament intended to make the POCSO Act gender-specific, the wording of Section 3 of the POCSO Act, which covers substantially the same sexual acts as Section 63 of the BNS, would also contain the same gender-specific language.

That the POCSO Act does not make any such specification should be seen as a deliberate legislative choice, reflecting the intent to make the POCSO Act more broadly applicable.

It serves the law's purpose

Finally, there are strong normative reasons for interpreting the POCSO Act as gender-neutral for both victims and perpetrators. The Supreme Court, in *Sakshi vs Union of India* (2004), highlighted the diversity of abuse that any law aimed at protecting children must encompass when it observed that child sexual abuse often involves a wide range of sexual conduct beyond penile-vaginal intercourse.

Although patterns of child sexual abuse can differ depending on the genders of the victim and perpetrator, such abuse is fundamentally embedded in imbalances of power, trust and vulnerability. Thus, the majority of cases reported under the POCSO Act still involve male perpetrators and female victims, but research and survivor accounts reveal that women can and do commit sexual offences against children. A gender-specific reading of the POCSO Act would render these experiences invisible and deny justice to certain victims.

The law's objective should be to safeguard children from sexual abuse, irrespective of the sex or gender identity of the person inflicting it.

To read the POCSO Act as gender-neutral, when it concerns both victims and perpetrators, is thus to remain faithful to its text and to its purpose.

GS. Paper 2 Polity, Governance

UPSC Mains Practice Question : PYQ : "Discuss whether the POCSO Act, 2012 can be considered gender-neutral in its application to perpetrators of child sexual offences. Examine the implications of such an interpretation." **(150 Words)**

Context :

The Protection of Children from Sexual Offences (POCSO) Act, 2012, is India's primary legislation to safeguard children from sexual abuse. A recent Supreme Court notice on a case involving a **woman accused of penetrative sexual assault on a minor boy** reignites a crucial debate: *Is POCSO gender-neutral in its application to perpetrators?* While the petitioner argues that the

law targets only male offenders, statutory interpretation, legislative intent and child protection principles overwhelmingly support a gender-neutral reading of POCSO.

Current Context

- A woman has been charged under **Section 3 (penetrative sexual assault)** of POCSO.
- She argues that the provision is *gender-specific* because it uses male pronouns ("he").
- **Supreme Court has issued notice**, making this a significant case for future interpretation.
- Government records (2024 Lok Sabha reply) state clearly: **POCSO is gender-neutral**.
- The issue affects the broader justice system, child rights, and consistency with other gendered laws like **Bharatiya Nyaya Sanhita (BNS) Section 63 (rape)**.

Static Context

About POCSO Act, 2012

- Enacted to protect children (<18 years) from sexual assault, harassment, pornography.
- Gender-neutral law → both boys and girls can be victims.
- Covers a wide spectrum of offences beyond penile penetration.
- Special Courts for speedy trial.

General Clauses Act, 1897

- **Section 13(1)**: Words importing masculine gender include females (unless context says otherwise).
- Important rule of statutory interpretation.

Bharatiya Nyaya Sanhita (2023) – Section 63

- Defines rape as an act committed by a man against a woman.
- Clearly gender-specific, unlike POCSO.

Supreme Court Precedent: Sakshi v. Union of India (2004)

- Recognised child sexual abuse goes beyond penile-vaginal intercourse.

Daily News Analysis

Detailed Analysis

1. Textual interpretation supports gender neutrality

- Section 3 involves:
  - digit penetration
  - object penetration
  - oral penetration
  - making a child perform sexual acts
- These acts can be committed by **any gender**, not only men.
- Use of "he" is overridden by **Section 13(1) of General Clauses Act** → masculine includes feminine.

2. Legislative intent confirms neutrality

- **Lok Sabha Written Reply (Dec 2024):** "POCSO is a gender-neutral Act."
- **2019 Amendment Bill's statement** reiterated this.
- If Parliament wanted gender specificity, it would have drafted Section 3 like BNS Section 63—explicitly stating "a man" and "a woman".
- Instead, POCSO uses **gender-neutral language deliberately**.

3. Purpose of the law demands neutrality

- Child sexual abuse ≠ only male predator/female victim.
- Abuse arises from power imbalance, trust violations—not only gender dynamics.
- Research shows **women also commit sexual offences**, though numbers are lower.
- Gender-specific interpretation would:
  - invalidate experiences of male victims
  - exempt female offenders
  - compromise child safety

Thus, **gender neutrality aligns with the Act's objective: protecting all children from all offenders**.

Conclusion

POCSO's text, legislative intent and the broader constitutional ethos of child protection collectively affirm that the Act is gender-neutral for both victims and perpetrators. Restricting the law to male offenders would deny justice to many child survivors, overlook real forms of abuse, and undermine the purpose of the Act. A gender-neutral interpretation is therefore essential to uphold the law's protective framework and ensure that *every child is safeguarded, irrespective of who the offender is*.

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