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Page 07 : GS 3 : Environment / Prelims

India's semi-arid grasslands and savannahs—long misclassified as "wastelands" since the colonial era—have re-emerged in scientific discourse as critical ecosystems for soil health, carbon sequestration, biodiversity, and pastoralist livelihoods. Recent studies from Solapur (Maharashtra) and Banni (Gujarat) challenge the dominant narrative that afforestation alone strengthens climate resilience. Instead, they highlight that grassland soils store more stable below-ground carbon than woody plantations, making them essential components of India's climate strategy.

Grassland soils, not trees, anchor India's climate resilience

Grasslands play a crucial role in the building and maintaining of healthy soils, primarily through their deep, fibrous root systems that stabilise the ground, enhance soil structure, and promote the storage of carbon; unlike forests, where most biomass is above ground, grassland productivity is concentrated below at root level

Tushar Pathade
Abi T. Vanak

"Wastelands". That's how India's biodiverse semi-arid grasslands and savannahs have been undervalued ever since the British colonial era. For the masters, the woody forests of the subcontinent fuelled industrialisation, while the grassy biomes served no purpose in their timber-driven colonisation.

Much of post-independence policy and jurisprudence drew heavily from the erstwhile rulers and "wastelands" made their way into land records and government policy. In 1985, a National Wastelands Development Board was created to bring a more scientific basis "to identify, classify and develop the wastelands" towards more productive uses. Ravines, scrub lands, degraded scrub forests, degraded pastures, grazing lands, barren rocky areas, glaciers and snow-covered mountains, along with mining or industrial wasteland and degraded plantation land, were all classified as wastelands.

For decades, studies have shown that far from being a wasteland, these savannah grasslands are flourishing ecosystems that not only harbour unique biodiversity but also provide livelihoods to millions of pastoral communities. Take Maharashtra, for instance. The State's livestock economy was valued at over ₹59,000 crmassive 50% more thaore in 2018-2019, and that's just one year.

What lies beneath

Grasslands play a crucial role in building and maintaining healthy soils, primarily through their deep, fibrous root systems that stabilise the ground, enhance soil structure, and promote long-term carbon storage. Unlike forests, where most biomass is above ground, grassland productivity is concentrated below ground, creating dense root mats that improve water infiltration, reduce erosion, and buffer soils against drought. These roots continually deposit organic matter, enriching soils with stable carbon compounds that can persist for centuries. Grassland soils also support diverse microbial and fungal communities that drive nutrient cycling and maintain soil fertility. When grasslands are degraded, converted, or afforested, these below-ground processes are disrupted, leading to compaction, erosion, loss of soil organic carbon, and reduced ecosystem resilience.

Savannahs and scrubland provide livelihoods to millions of pastoralists. HARSHA VADLAMANI

As the climate crisis worsened, the importance of carbon sequestration in ecosystems moved to the forefront of global discussions. Research began pouring in from around the world, showing that grasslands hold enormous potential for carbon sequestration. Thus, in addition to their role as an abode of diverse wildlife and their socio-economic importance, we now know that grasslands store a huge amount of below-ground carbon, which remains undisturbed even by fire. A pioneering initiative in Solapur's semi-arid grasslands signalled a shift in the Maharashtra State forest department's perception of these ecosystems. The Compensatory Afforestation Fund Management and Planning Authority (CAMPA) which manages funds collected for the conversion of forest land to non-forest for developmental works, decided to use a part of this for restoring degraded grasslands.

CAMPA authority of the Maharashtra forest department restored degraded patches of grassland in the Malshiras forest range of Solapur district over several years. Native grasses such as *Dicanthium annulatum*, *Chrysopogon fulvus* and *Cenchrus setigerus* were raised in a nursery and then later planted in situ after the first monsoon showers.

Subsequently, a study was conducted by researchers from Ashoka Trust for Research in Ecology and Environment, Bengaluru and The Grasslands Trust, in partnership with the forest department to understand the impacts of these restoration activities on soil, including carbon sequestration. This study compared restored plots of different ages (one, two and three years) to an unrestored site, and to an undisturbed old-growth grassland. The study revealed that the restored grasslands showed a significant increase in the soil organic carbon (SOC) at the treatment sites compared to the control sites.

After two years, the restored sites showed an increase of 21% SOC compared to the untreated site, and a massive 50% more than the untreated site by the third year. These findings highlight how grassland restoration paves the way for India to meet its climate goals

After two years, the restored sites showed an increase of 21% SOC compared to the untreated site, and a massive 50% greater than the untreated by the third year. These findings highlight how grassland restoration from the CAMPA funds paves the way for India to meet its climate goals.

Another recently published study by researchers at ATREE has documented the remarkable carbon sequestration potential of the Banni Grassland in the Kutch district of Gujarat. Once celebrated as the largest tropical grassland in Asia, Banni suffered decades of policy missteps that promoted large-scale planting of the invasive mesquite (*Neltuma juliflora*). This rapidly transformed vast open savannahs into dense, impenetrable thickets, degrading both ecology and pastoral livelihoods. The study reveals a striking pattern: restored grassland patches, locally known as *wada*, store the highest levels of soil organic carbon (SOC), followed by wetlands and dense woodlands. The lowest SOC values were found in mixed woodland stands and saline grasslands. What makes Banni especially noteworthy is that these restored patches were revived by the community itself, first by removing *Prosopis* and allowing native perennial grasses to regenerate

Carbon-rich and arid

The Maldhari pastoralists manage these areas through rotational grazing, controlled harvest of standing biomass, and careful monitoring of grass recovery. Across its four major land-use types, Banni stores 27 metric tonnes of carbon up to 30 cm soil depth, with an average SOC density of around 120 tonnes of carbon per hectare. This places Banni among the most carbon-rich arid ecosystems globally, demonstrating that healthy grasslands, not invasive trees, underpin true climate resilience in drylands.

Banni also shows the way forward: restoring native grasses, removing invasive woody cover, and placing pastoralist communities at the centre of governance. Participatory, community-led grassland management is not just a restoration method–it is the restoration outcome. The Intergovernmental Panel on Climate Change reminds us that soils hold twice as much carbon as the atmosphere and all living biomass combined. In an era of rising temperatures and more frequent forest fires, the relative stability of SOC in grasslands–protected beneath the soil surface–is an advantage we urgently need to recognise.

Banni and Malshiras teach us a profound lesson: our strongest climate solutions lie beneath our feet. The deep roots of native grasses have been storing carbon for millennia, long before the word "sequestration" entered our vocabulary. India's climate-resilient future will not be achieved merely by planting trees; in many places, especially in our drylands, it will come from restoring ecosystems where the soil still remembers how to breathe.

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THE GIST

- Far from being wastelands, grasslands are flourishing ecosystems that not only harbour biodiversity but also provide livelihoods to millions of pastoral communities; in Maharashtra, the livestock economy was valued at ₹59,000 crore in 2018-2019
- Grasslands hold enormous potential for carbon sequestration; in addition to being an abode for wildlife, and their socio-economic importance, we now know that grasslands store a huge amount of below-ground carbon, which remains undisturbed even by fire
- The Banni Grassland stores 27 metric tonnes of carbon up to 30 cm in depth, with an average SOC density of 120 tonnes of carbon per hectare; this makes it among the most carbon-rich arid ecosystems globally, demonstrating that grasslands, not trees, underpin true climate resilience

Key Issues & Background

1. Colonial and Post-Independence Misclassification

- British-era land classification labelled grasslands as "wastelands," favouring forests for timber extraction.
- This continued post-Independence through the National Wastelands Development Board (1985).
- Grasslands became targets for afforestation and tree planting, often degrading their native ecology.

2. Ecological Value of Grasslands

- Grasslands possess deep, fibrous root systems that:
  - Stabilise soil
  - Increase water infiltration
  - Reduce erosion
  - Enhance long-term soil organic carbon (SOC)
- Unlike forests, whose carbon is largely above ground and vulnerable to fire, SOC in grasslands is stable for centuries.

Recent Evidence Highlighted in the Article

A. Maharashtra CAMPA Grassland Restoration

- Native grasses (e.g., Dicanthium, Chrysopogon, Cenchrus) restored in Solapur.
- ATREE & Forest Department study compared restored vs. unrestored plots.
- Findings:
  - 21% increase in SOC in 2 years
  - 50% increase by year 3
- Indicates that grassland restoration is a high-return climate intervention, especially for semi-arid regions.

B. Banni Grassland (Kutch, Gujarat) Study

- Historically Asia's largest tropical grassland, degraded by invasive Prosopis (mesquite) due to past policy push for afforestation.

- Community-led restoration (wada patches) demonstrates:
  - Highest SOC in restored grasslands, followed by wetlands and woodlands.
  - Banni stores ~120 tonnes of carbon per hectare up to 30 cm soil depth — placing it among the most carbon-rich arid ecosystems globally.
- Maldhari pastoralists manage grasslands through rotational grazing and biomass harvesting, showing the role of traditional knowledge.

Key Analysis

1. Climate Policy Misalignment

India's climate policies often emphasise tree planting, ignoring ecological diversity. The article underscores that afforestation can harm native grasslands and reduce SOC by disrupting natural root–soil–microbe interactions.

2. Role of Communities

Both Solapur and Banni show that community stewardship + scientific restoration is more effective than top-down afforestation drives.

3. Soil Carbon as a Climate Asset

- IPCC notes: Soils store twice as much carbon as the atmosphere + biomass combined.
- Grassland carbon is more fire-resistant and resilient than forest carbon.
- This has implications for India's NDCs and Land Degradation Neutrality (LDN) targets.

4. Biodiversity and Livelihood Link

Grasslands support:

- Endangered species (e.g., Great Indian Bustard, blackbuck).
- Millions of pastoralists and cattle economies (e.g., Maharashtra livestock sector valued at ₹59,000 crore).

Policy Implications

- Need to reclassify semi-arid grasslands as distinct ecosystems, not "wastelands."
- Redirect CAMPA funds toward grassland restoration where appropriate.
- Establish national grassland conservation guidelines under MoEFCC.
- Promote community-led governance, especially where traditional pastoral systems exist.

- Integrate grasslands into carbon accounting frameworks and climate resilience planning.

Conclusion

The article makes a compelling case that India's dryland climate resilience is rooted not in planting more trees, but in restoring the grasslands beneath our feet. Grassland soils hold vast, stable carbon reserves, support biodiversity, and sustain pastoral economies. As climate change accelerates and forest fires become more frequent, India must shift from a timber-centric or plantation-centric mindset to one that values soil-based carbon, native ecosystems, and community-led conservation. Grasslands are not wastelands—they are one of India's strongest natural climate solutions.

UPSC Prelims Practice Question

Ques: **Consider the following statements regarding India's grassland ecosystems:**

1. Most of the biomass in grasslands is stored below ground.

2. Grassland soils can store carbon that remains stable even after fire events.

3. Grasslands were historically classified as "wastelands" in India's land records.

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: d)

UPSC Mains Practice Question

Ques: Explain the ecological characteristics of semi-arid savannahs in India. How do they differ from forest ecosystems in terms of carbon storage and biodiversity? **(150 Words)**

Page 08 : GS 2 : International Relations / Prelims

The recent visit of Russian President Vladimir Putin to India — his first since the 2022 Ukraine invasion — marks a significant moment in India's foreign policy. Despite global attempts to diplomatically isolate Moscow and stiff Western sanctions, India hosted President Putin for a full state visit. The move signals New Delhi's intent to maintain strategic autonomy, balancing ties with both Russia and the West at a time of deep geopolitical polarisation.

Key Issues & Context

1. India–Russia Relations at 25 Years of Strategic Partnership

- 2024–25 marks 25 years of annual summits and strategic partnership.
- The visit underscores that India still considers Russia a long-term partner in defence, energy, nuclear cooperation and multipolarity advocacy.

2. Ukraine War & the ICC Warrant

- Putin carries an ICC arrest warrant and is sanctioned heavily by the U.S. and EU.
- His intensified attacks in Ukraine and rejection of U.S. peace proposals worsen Russia–West hostility.
- In such a climate, India's decision to invite him conveys political signalling:
    - Russia remains a friend.
    - India will not publicly criticise Moscow despite Western expectations.
    - India will continue navigating the conflict without taking sides.

Highlights of the Modi–Putin Meeting

A. Diplomatic & Economic Takeaways

The summit emphasised non-strategic sectors to avoid aggravating the West:

- Labour mobility agreement
- MoU to set up a urea plant in Russia
- Adoption of the 2024 India–Russia Economic Roadmap, focusing on:
    - Maritime connectivity (Chennai–Vladivostok corridor)
    - Increasing bilateral trade
    - Developing a national currency payment system to bypass sanctions

India wants to keep economic links alive even as deterrents like:

- U.S. tariff surcharge of 25%
- Corporate sanctions on Russian and Indian entities pressure trade volumes.

B. What Was Intentionally Avoided

To avoid provoking the West, India did not announce agreements in:

- Defence hardware
- Nuclear cooperation
- Space technology
- Increase in Russian oil imports

This calibrated omission shows sensitivity to ongoing India–U.S. and India–EU negotiations on:

- Free Trade Agreements
- High-level visits
- Critical and emerging technologies partnerships

Analysis: The Balancing Act

1. India's Strategic Autonomy at Play

India aims to:

- Maintain legacy defence and energy ties with Russia
- Continue expanding high-technology, trade, and strategic partnerships with the West

This follows the classical Indian doctrine of multi-alignment rather than bloc politics.

2. Benefits of Engagement with Russia

- Cheapest and reliable oil supplies during the crisis
- Defence maintenance for legacy systems
- Access to Arctic routes + Eurasian connectivity
- Partnership in nuclear energy and space (though not highlighted this year)

3. Constraints on the Relationship

- Increasing sanctions regimes

- Western pressure to reduce dependency
- India's desire to avoid secondary sanctions
- EU FTA negotiations and U.S. strategic convergences (Quad, Indo-Pacific)

4. The Editorial's Caution: Avoid Pendulum Diplomacy

The article warns that:

- India must avoid swinging between Russia and the West.
- Strategic autonomy requires stability, predictability and consistency, not reactive shifts.
- Over-correction toward one side risks damaging the other.

Implications for India's Foreign Policy

- India must keep trust with both camps without appearing opportunistic.
- Ensure Russia remains engaged, especially as China grows closer to Moscow.
- Maintain credibility with the West in Indo-Pacific cooperation and trade frameworks.
- Use economic cooperation as a soft anchor while controlling sensitive defence collaboration visibility.

Conclusion

The Modi–Putin summit demonstrates India's determination to hold its strategic space amid major power rivalry. By avoiding sensitive military agreements but deepening economic cooperation, New Delhi balanced Western anxieties with Russian expectations. Going forward, India's strategic autonomy will depend not on dramatic swings but on steady, consistent engagement with both Russia and the West — ensuring that India's choices are driven by national interest, not geopolitical pressure.

UPSC Mains Practice Question

Ques : India's approach to Russia in recent years highlights the complexities of balancing traditional partnerships with emerging strategic alignments. In this context, critically examine how India can maintain strategic autonomy while managing simultaneous engagements with Russia and the West. **(150 words)**

Page 08 : GS 2 : Governance / Prelims

The increasing integration of digital surveillance tools—biometric attendance, geo-tagged photographs, Facial Recognition Technology (FRT), and app-based monitoring—into welfare delivery is being justified as a solution to leakages and corruption. Reetika Khera's analysis highlights how these technologies, instead of strengthening accountability, often create new barriers, exclusions, and distortions in public service delivery.

Surveillance apps in welfare, snake oil for accountability

It is increasingly common to see cleaning staff photographing or filming themselves at work. This is meant to ensure that they do their job. How effective it is, is anybody's guess.

The lack of accountability of government employees manifests itself in many ways in India – they may be absent from work, may come late or leave early, may not work in a time-bound manner, and may expect bribes.

The biometric era

Somewhere along the line, digital tools emerged as the magic wand for this vexatious problem. For instance, years ago, some governments in India introduced biometric attendance to ensure punctuality. In some cases, if biometric attendance was not marked on time, employees were threatened with punitive action. At that time, in Khunti Block (Jharkhand), some conscientious officials worked after office hours to complete online tasks that required connectivity ("digital paperwork") because Internet bandwidth improved in the evenings. With the system of clocking in and out, their emphasis shifted from getting the work done to marking biometric attendance in a timely manner. In Rajasthan, a Randomized Controlled Trial (RCT) that studied the impact of biometric attendance on absenteeism among government nurses found that, in the long run, it resulted in lower attendance.

Take another example. In the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), official worker attendance is widely inflated to siphon off wages. Wage expenditure is booked on the basis of fudged attendance and either shared with participating "workers" (job cards holders who do not actually work) or pocketed entirely by the masterminds.

In response, the government introduced the National Mobile Monitoring System (NMMS) app in 2022. The NMMS app requires a photograph of workers at the worksite to be uploaded twice a day. It was meant to put an end to fudged attendance records. The app might succeed in forcing worker presence at the NREGA worksite, but it cannot guarantee that they do any useful work once they are there. In the most egregious cases workers were not even showing up twice a day to mark attendance: the masterminds were uploading random photographs. They worked out that the NMMS app only needs a jpeg file: irrelevant photographs and photographs of photographs can do the trick.

A July 2025 circular of the Union Ministry of Rural Development (MoRD) lists seven such malpractices. Fudged photographs replaced fudged signatures to inflate attendance and the racket continued, more or less as before.

Reetika Khera

is Professor of Economics at IIT Delhi

Tech-fixes and apps cannot foster a responsible work environment that motivates workers to act in public interest

Around the same time, the Ministry of Women and Child Development (MoWCD) made "Facial Recognition Technology" (FRT) compulsory for Take Home Rations (THR). The reasoning is familiar: THR packets for children and pregnant and lactating mothers do not reach them. Making it mandatory to upload the mother's photograph (with blinking) on the Poshan Tracker is supposed to ensure that she does not get cheated. The Poshan Tracker ostensibly does a real-time match of the live photograph with an on-record photograph.

An Anganwadi worker in Nuh (Haryana) who was struggling with connectivity, a crowd and the clunky app, said matter-of-factly, "those who want to cheat will continue", i.e., nothing prevents an Anganwadi worker from refusing THR packets to mothers after they have jumped through the hoops of Poshan Tracker's FRT.

This loophole was documented in 2017 when the Aadhaar-Based Biometric Authentication (ABBA) was made mandatory for Public Distribution System (PDS) rations. It was the same logic again: ABBA would ensure that only person A could receive their benefits. This meant that the elderly and persons with disabilities who would request neighbours or relatives to pick up their rations, could no longer do so. Person A (sick, old, or immobile) would have to show up in person. Many began to be excluded as a result.

Subsequently, some States put an 'override' mechanism in place, at least on paper. Meanwhile, PDS ration dealers would make people authenticate – biometrically – for their full quota of rations, while giving them a bit less (in 2017, in Jharkhand, an accepted norm was 4.5 kilograms instead of 5 kg). ABBA resulted in "pain without gain".

Limited effect

In many States across India, a number of tasks done by Auxiliary Nurses and Midwives (ANMs) require geo-tagging or photographic evidence. For instance, uploading photos of a breastfeeding mother as proof that the ANM had done breastfeeding counselling. This results in a perverse situation: uploading a photo without counselling would not get her into trouble, but counselling without the photo upload would. In a tribal area of Andhra Pradesh, another ANM said that she was compelled to move around for connectivity in order to log a home visit on the app. She looked visibly hurt as she showed us a "show cause notice" she got soon after: as she had moved more than 300 metres to log the home visit and the app red-flagged her visit as fraudulent. Such surveillance apps, in accountability clothing, demotivate sincere workers.

At best, such apps can have a limited impact on accountability. But accountability itself is a limited achievement.

Jean Drèze and Amartya Sen (2025) urge us to go beyond accountability (which "can induce people to do what someone else wants them to do") towards responsibility (as it "includes what people themselves want to do in the public interest").

The tech-fixes described above cannot foster responsible behaviour, and cannot help self-motivate workers to act in public interest. The current obsessive fixation with tech-fixes diverts attention from the larger goal of improving work culture and changing social norms. It blinds us to other pathways to get there. For instance, few ask how is it that even in areas with poor accountability, so many nurses, teachers, doctors and cleaners work diligently?

A case of agnotology

Returning to accountability in welfare programmes, the government is consciously ignoring the failures of tech-fixes. For instance, even though the MoRD officially acknowledged that the NMMS was being "misused and manipulated", in July, the MoWCD made FRT compulsory for THRs in July. Moreover, having admitted to the failure of NMMS, the MoRD responded by ordering "100% verification of all uploaded photographs" each day in all gram panchayats.

There is a carefully cultivated ignorance towards new problems created by apps: exclusion (in the PDS, of the elderly, and the immobile for whom ABBA fails; in NREGA, of workers whose photographs could not be uploaded on NMMS), inefficiency (distribution of PDS rations and THR packets takes much longer), new forms of corruption (claiming ABBA failures even when it is successful), privacy invasions (uploading photographs of breastfeeding mothers), identity fraud, and worker demotivation.

The stubborn refusal to learn is baffling. It raises questions about the possible capture of decision-making by vested interests to create assured markets for their products. The infrastructure for surveillance apps (devices including smartphones for all frontline workers, electronic point of sale machines, hard drives, servers, Internet data, authentication services) is not cheap. Tech companies are doing today what the tobacco and refined white sugar industry did in the past – cultivate ignorance about the harms from their products to stall corrective action. The government is playing along.

Science historian Robert Proctor uses the term agnotology, how and why various forms of knowledge have "not come to be", for this phenomenon. Put simply, tech-fixes are snake oil for accountability in welfare.

Key Issues Highlighted

1. Tech-Fixes Do Not Solve Structural Accountability Problems

Government employees often face issues of absenteeism, delayed work, or bribe-taking. Digital tools were expected to act as a deterrent, but evidence shows otherwise:

- Biometric attendance in Rajasthan (RCT) reduced long-term attendance of nurses.
- Workers shift focus from actual work to merely fulfilling biometric requirements.

This reflects a classic governance issue: systems improve compliance, not commitment.

2. MGNREGA's NMMS App — Old Corruption in New Packaging

- App requires photographs of workers twice daily to prevent fudged attendance.
- But manipulation continues: random photos, photos of photos, or irrelevant JPEGs are uploaded.
- A July 2025 MoRD circular documented seven manipulation techniques.

Thus, digital vigilance failed to eliminate leakages and instead increased workload and frustrations.

3. Poshan Tracker & FRT — Exclusion Risks

Mandatory Facial Recognition for mothers receiving Take Home Rations (THR) creates:

- Delays due to poor connectivity.
- Stress for frontline workers.
- A loophole where cheating can still occur despite verified presence.

Like Aadhaar-based biometric authentication (ABBA) in PDS, FRT risks excluding elderly, disabled, and remote populations who cannot be physically present.

4. Distortion of Frontline Service Delivery

ANMs and Anganwadi workers spend more time:

- Searching for network,
- Taking photos,
- Complying with app design flaws,

rather than providing actual care. Genuine work without photographic evidence becomes punishable, whereas fake compliance is rewarded.

This is a perverse incentive, harming morale and public trust.

5. Failure to Learn From Mistakes: Agnotology

Despite acknowledging misuse of NMMS and failures in ABBA:

- MoRD ordered 100% verification of photographs.
- MoWCD made FRT compulsory for THR in July 2025.

This indicates institutional ignorance (agnotology)—the deliberate overlooking of evidence showing harm or inefficiency.

Possible drivers:

- Tech companies seek assured markets.
- Governments find technological solutions politically appealing and "modern".

Underlying Governance Problems

The article argues that:

- Accountability (external enforcement) is being mistaken for Responsibility (internal motivation).
- Surveillance cannot create a culture of commitment or public service.
- Instead, it increases:
  - Privacy risks,
  - Opportunistic corruption,
  - Exclusion of vulnerable citizens,
  - Inefficiency and delays.

Way Forward

1. Human-Centric Governance: Strengthen work culture, recognition systems, and supervision instead of over-relying on tech.
2. Selective Use of Technology: Deploy tech where it demonstrably reduces harm, not as a default solution.
3. Privacy and Data Protection Frameworks: Ensure compliance with the Digital Personal Data Protection Act.
4. Empowering Frontline Workers: Provide training, reduce administrative burdens, and adopt trust-based systems.

5. Continuous Evaluation: Learn from state-level experiments; adopt evidence-based policy iterations.

Conclusion

Surveillance apps promise accountability but often produce exclusion, demotivation, and new corruption pathways. As Khera argues, these digital tools serve as "snake oil": they appear modern and efficient but ignore deeper structural issues in welfare governance. Sustainable reform requires strengthening responsibility, improving work culture, and creating supportive institutional frameworks, rather than relying on technological quick fixes.

UPSC Prelims Practice Question

Ques: With reference to digital accountability tools in welfare programmes, consider the following statements:

1. The National Mobile Monitoring System (NMMS) app under MGNREGA requires uploading worker photographs twice a day.

2. Facial Recognition Technology (FRT) has been made mandatory for Take Home Rations (THR) under the Poshan Tracker.

3. A Randomized Controlled Trial (RCT) in Rajasthan found that biometric attendance improved long-term attendance among government nurses.

Which of the statements given above is/are correct?

(a) 1 and 2 only

(b) 1 and 3 only

(c) 2 and 3 only

(d) 1, 2 and 3

Ans: a)

UPSC Mains Practice Question

Ques : Digital surveillance tools in welfare programmes promise greater accountability but often end up generating exclusion, inefficiency, and new forms of corruption." Discuss with suitable examples. **(250 words)**

Page 09 : GS 2 : Social Justice

India is entering a phase of rapid population ageing. With 153 million elderly (60+) today, projected to rise to 347 million by 2050, the challenge of providing universal and sustainable old-age security has become central to social policy. Traditionally dominated by welfare-based assistance, India's pension landscape has gradually shifted towards a participatory, contributory and financially inclusive framework, aiming to cover both formal and informal sector workers.

The evolution of pension reforms in India

There has been a gradual but decisive shift from a welfare-based social assistance to a more participatory inclusion framework

DATA POINT

Akshaya Ranganath
Shreya Bhattacharya

India's rapidly ageing population is emerging as a pivotal pension challenge. Today, over 153 million Indians are aged over 60. This is projected to double to 347 million by 2050. While a small section of older Indians has benefited from the rise of formal sector retirement, more than 88% of today's senior citizens continue to work, in the sprawling informal economy, without access to pensions or reliable social security rather than retiring **(Chart 1)**. We revisit the evolution of pension schemes for financial inclusivity of the Indian informal sector.

The Indira Gandhi National Old Age Pension Scheme (IGNOAPS) is a social assistance programme launched in 1995 for persons aged over 65, living below the poverty line (BPL). Subsequent changes expanded scheme eligibility and strengthened financial support, leading to a significant rise in enrolment. It is a first among national-level efforts taken to provide a direct, regular source of income to the older population in the unorganised and economically vulnerable section of society. Similarly, formal sector government employees were covered under the government-sponsored Old Pension Scheme (OPS).

Research finds that unlike social benefit schemes, contributory pension schemes in developing countries encourage household formal savings behaviour. Announced in Budget 2015-16, the Atal Pension Yojana (APY) is a contributory pension scheme for individuals aged 18-40, where periodic contributions are made to a pension account. At retirement, the accumulated amount, including returns, is disbursed, with the government guaranteeing a minimum pension if returns fall short. Taking into consideration the seasonal nature of informal sector income, especially agriculture, the APY allows for not just monthly but also quarterly and half-yearly instalments.

For the formal sector, OPS was replaced by the contributory-model New Pension Scheme (NPS) in 2004. The NPS also has a corporate sector model which extends to all corporate sector employees with a savings account. Recently, the NPS 2.0 was launched allowing total allotment to 100% equity and a flexible multiple scheme framework (MSF) – an attractive change for younger high-risk, high-reward-type investors. The APY and NPS models form a comprehensive long-term financial security framework that ensures inclusion in the formal financial system, despite the sectoral divide.

The Labour Codes introduced a uniform definition of 'wages', requiring that basic pay make up at least 50% of total earnings. This closes a long-standing loophole that allowed employers to shrink basic pay by inflating allowances. With pension, gratuity, and social security benefits now calculated on a higher base, workers stand to gain stronger financial protection.

The progression of pension schemes in India reflects a hierarchical pattern in which each stage builds on the needs identified before it. Through an equity and social-welfare lens, the government first introduced IGNOAPS and OPS to meet the basic needs of older adults. Having secured social protection, the focus shifted to more sophisticated goals such as financial inclusion and savings and investment behaviour through the NPS and the NPS 2.0. To bridge sectoral divide, similar behavioural nudges were extended to informal-sector workers via the APY.

Many of these schemes are explicitly targeted at BPL individuals, and are therefore designed to extend coverage to informal-sector workers who lack access to formal retirement provisions. However, there still exists a gap in awareness of schemes amongst the eligible population. Our findings from the Longitudinal Ageing Survey of India (LASI) show that as of 2017-18, 42% of individuals aged over 55 were still unaware of NPS and its eligibility criteria and requirements **(Chart 2)**.

To tackle limited awareness and fragmented access to welfare programs, the e-SHRAM portal was launched as a national database for informal sector workers. Through this, workers can register and obtain information about social security schemes for which they are eligible. Our analysis of the LASI data shows that over age 55, about 75.6% of women and 68% of men work in this sector.

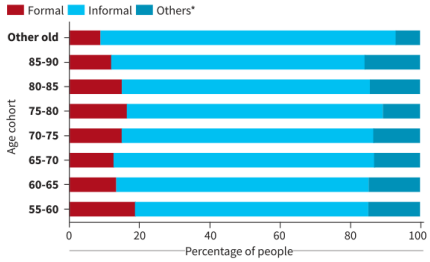
While this is a significant step towards integrating the informal workforce into the country's formal social protection system, realising e-SHRAM's full potential depends on overcoming challenges related to registration, awareness, and effective disbursement of benefits. For instance, registration requires Aadhaar to phone number linkage and a savings bank account, which is susceptible to errors of exclusion. Moreover, according to the Comprehensive Annual Modular Survey of India (2022-23), 63% of the elderly population do not know how to use the Internet. This risks leaving the most economically vulnerable among them behind.

The evolution of pension schemes in India has seen a gradual but decisive shift from a welfare-based social assistance to a more participatory inclusion framework. While the challenges of unawareness still remain, initiatives such as e-SHRAM signal a data-driven approach to policy targeted at the older age population. The trajectory of these continuing revisions and initiatives will pave the way for inclusive policies and dignify the contributions of the elderly in their later years of life.

Securing the future

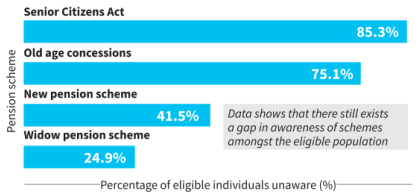
The data for the charts were sourced from the Longitudinal Ageing Study in India (LASI), Wave 1 (2017-18)

CHART 1: Percentage distribution of employment type by age cohort (55+)



*Cases where available information was insufficient to determine the sector

CHART 2: Share of eligible individuals unaware of pension schemes (%)



Akshaya Ranganath and Shreya Bhattacharya are with the Center for Advanced Financial Research and Learning (Reserve Bank of India)

Key Analysis

1. Early Welfare-Oriented Approach

- Indira Gandhi National Old Age Pension Scheme (IGNOAPS), launched in 1995, marked the first national-level initiative to provide a direct income floor to elderly individuals living below the poverty line.
- Simultaneously, formal government employees were covered under the Old Pension Scheme (OPS), a defined-benefit, non-contributory model ensuring lifetime pension.

Significance:
These schemes addressed the immediate welfare needs of the economically vulnerable elderly but did not promote long-term savings or financial participation.

2. Shift towards Contributory Pension Models

(a) Atal Pension Yojana (APY) – 2015

- Designed for informal sector workers (18–40 years).
- Provides guaranteed pension on retirement, based on regular contributions.
- Offers monthly, quarterly, and half-yearly payment flexibility acknowledging seasonal incomes.

Impact: Encourages formal saving behaviour, expanding pension coverage beyond welfare assistance.

(b) New Pension Scheme (NPS) – 2004

- Replaced OPS for new government employees.
- A defined-contribution system linked to market returns.
- Extended to corporate sector employees.

(c) NPS 2.0

- Allows 100% equity allocation and a Multiple Scheme Framework for investors seeking higher returns—an appealing option for young contributors.

Significance:
The NPS/APY architecture represents a comprehensive long-term financial security system, bridging formal–informal divides.

3. Labour Code Reforms: Strengthening Social Security Base

- Introduction of a uniform definition of 'wages', ensuring basic salary = minimum 50% of total pay.
- Removes past loopholes where employers kept basic pay low to reduce pension and gratuity liabilities.

Impact:
Strengthens financial protection of workers through higher social-security-linked contributions.

4. Persistent Challenges

(a) Awareness Deficit

- LASI data (2017–18) shows 42% of people above 55 were unaware of NPS schemes and eligibility.
- Low awareness limits uptake despite policy expansion.

(b) Limited Digital Literacy

- 63% of elderly lack internet literacy (CAMS 2022-23), restricting access to digital platforms.

(c) Informal Sector Barriers

- 75.6% of women and 68% of men above 55 work in the informal sector.
- Aadhaar–phone linkage issues, lack of bank accounts, and procedural complexities create exclusion errors.

5. e-SHRAM Portal: A Structural Reform

- A national database for informal workers, enabling registration and access to all eligible social security benefits.
- Represents a shift to data-driven welfare delivery.

Challenge:
Effectiveness depends on overcoming digital access barriers and ensuring accurate registration and benefit disbursement.

Conclusion

India's pension reforms reflect a clear evolution—from welfare-based social protection (IGNOAPS, OPS) to a participatory, contributory, financially inclusive model (NPS, APY). While these reforms have expanded the pension net, especially for informal workers, awareness deficits, digital exclusion and registration hurdles remain major bottlenecks. Moving forward, stronger last-mile delivery, simplified enrolment, and targeted awareness campaigns are essential. These steps would ensure that pension reforms truly empower the elderly, uphold their dignity, and strengthen India's social security architecture in an ageing future.

UPSC Mains Practice Question

Ques : India's pension reforms reflect a shift from welfare-based assistance to participatory financial inclusion. Discuss. **(250 Words)**

Page 10 : GS 2 : Governance / Prelims

The Ministry of Statistics and Programme Implementation (MoSPI) released the draft Indian Statistical Institute Bill, 2025 on September 25, proposing to repeal the ISI Act, 1959. The move aims to convert ISI from a registered society to a statutory body corporate as part of governance reforms. However, the Bill has triggered protests by students, faculty, and senior academicians who argue that the proposed changes threaten institutional autonomy, academic freedoms, and federal principles crucial for a premier research institution like ISI.

What are concerns over the draft ISI Bill, 2025?

Why did the Ministry of Statistics and Programme Implementation release the draft Indian Statistical Institute Bill, 2025, repealing the Indian Statistical Institute Act, 1959? Why are students and academicians protesting? How will it affect the revenue generating mechanisms of the institute?

EXPLAINER

Shiv Sahay Singh

The story so far:

On September 25, the Ministry of Statistics and Programme Implementation (MoSPI) released the draft Indian Statistical Institute Bill, 2025. The Bill has been met with strong protests by academicians as well as students of the Indian Statistical Institute (ISI) who claim that the move is aimed to strip the institute of its academic autonomy by converting it from a "registered society to a statutory body corporate".

What is the significance of the ISI?

The ISI was founded in December 1931 by P.C. Mahalanobis in Kolkata and has since grown into one of India's most prestigious academic and research institutions. The institute was originally registered in April 1932, under the Societies Registration Act of 1860, and later re-registered under the West Bengal Societies Registration Act of 1961. Being a society provided the institute its own memorandum of association, bye-laws, and regulations. Parliament enacted the Indian Statistical Institute Act, 1959, declaring ISI as an Institution of National Importance (INI).

Many scholars link the origin of the institute to the Bengal renaissance and credit the institute with shaping India's planning and policy apparatus. The National Sample Survey Organisation (NSSO) was developed at ISI, establishing the foundation of India's official statistical system. Other than P.C.Mahalanobis, the institute has produced legendary scholars such as Professor C.R. Rao and S.R.S. Varadhan.

With about 1,200 students and six centres across India, ISI offers undergraduate and postgraduate degrees in Statistics, Mathematics, Quantitative Economics, Computer Science, Library and Information Science, Cryptology and Security, Quality Management Science and Operations Research.

Major changes: The Kolkata-based Indian Statistical Institute. FILE PHOTO

Why are academicians protesting?

The primary concern of those opposing the draft Bill is how the ISI's institutional status will change, from a "a registered society to a statutory body corporate".

A recent letter by about 1,500 academicians to Rao Inderjit Singh, Minister of State (Independent Charge) MoSPI, stated that there is no transparent reason that MoSPI should repeal the (1959) Act, abolish the society and introduce a Bill which violates the basic spirit of the agreement between the general body of the society and the government. The letter also states that the move to bypass the society registered under the WB Societies Registration Act to a "statutory body corporate" infringes upon the jurisdiction of the Societies Registration Act and is against the spirit of cooperative federalism. On November 28, hundreds of students and staff of ISI formed a human chain and held a public meeting near the institute's campus on B.T. Road in North Kolkata.

Those opposing the draft Bill point out that the governance structure, as in the existing 1959 Act, vested authority in a council with academic representation, and procedural safeguards against government overreach. The proposed 2025 Bill, however, gives power to the Board of Governors (BoG), defined under Section 15 of the Act, which is heavily dominated by government nominees sidelining the authority of faculty and academic stakeholders. Former professor of ISI and chairman of West Bengal Infrastructure Development Finance Corporation Abhirup Sarkar said that the ISI is a place of doing basic research which is a long-term process where immediate results may not be visible. Since there is a push for a corporate model of funding in the draft Bill, getting funds for basic research projects could be a problem in the future. Section 29 of the proposed 2025 Act deals with 'power to generate revenue' which includes student fees, consultancy services and sponsored research projects among others.

Another critical area raised by those opposing the Bill is that all appointments will be controlled by the Union government, through the BoG. Earlier there were 10 representatives from ISI (eight elected, one worker and one scientific worker) out of the 33 representatives on the council, a little less than one-third. Now there will be none. Professor Sarkar said that after the proposed Bill, there are apprehensions of political interference in the appointments by the Union Government.

What is the government saying?

The government claims that the idea behind the legislation is the vision to make ISI not only one of the best in India but one of the foremost institutes in the world as the institute approaches its centenary in 2031. A press release stated that, over the years, four review committees had examined the functioning of ISI. The most recent, chaired by Dr. R.A. Mashelkar in 2020, recommended major reforms to strengthen governance, expand academic programmes, and make ISI globally competitive.

What lies ahead?

The students and academicians are banking on the support of Opposition parties to oppose the proposed legislation. Villupuram Member of Parliament D. Ravikumar has written to the Union Minister of State (MoPSI) urging him to withdraw the draft Indian Statistical Institute Bill, 2025. Leaders from Trinamool Congress and Communist Party of India (Marxist) have also publicly opposed the draft legislation and vowed to oppose it if it is tabled in Parliament.

THE GIST

- The ISI was founded in December 1931 by P.C. Mahalanobis in Kolkata and has since grown into one of India's most prestigious academic and research institutions.
- The government claims that the idea behind the legislation is the vision to make ISI not only one of the best in India but one of the foremost institutes in the world as the institute approaches its centenary in 2031.
- Villupuram Member of Parliament D. Ravikumar has written to the Union Minister of State (MoPSI) urging him to withdraw the draft Indian Statistical Institute Bill, 2025.

Why Was the New Bill Introduced?

1. Government's Stated Reasons

- ISI will turn 100 years old in 2031; MoSPI claims the reform is needed to make it globally competitive.
- Four review committees over the decades, including the Mashelkar Committee (2020), recommended:
    - Strengthening governance and accountability

- Modernising processes
- Expanding academic programmes
- Improving global rankings and academic output

2. Shift in Legal Status

- The Bill seeks to convert ISI from:
  - A registered society (under West Bengal Societies Act) →
  - A statutory body corporate established through a Parliamentary Act.

The government argues this will provide clearer legal authority, a modern governance structure, and stronger financial mechanisms.

Why Are Academicians and Students Protesting?

1. Threat to Academic Autonomy

- Under the 1959 Act, governance was vested in a Council with significant academic representation.
- The new Bill replaces this with a Board of Governors (BoG) dominated by government nominees.
- Academicians fear that:
  - Academic decision-making will shift to bureaucratic control
  - Research priorities may be influenced by political or administrative considerations
  - The culture of academic freedom built since 1931 may be diluted

2. Centralisation and Reduced Internal Representation

- Previously: 10 representatives from ISI (faculty, workers, researchers) in a 33-member council.
- Under the new Bill: zero guaranteed representation from internal ISI stakeholders in the BoG.
- Concern: Absence of faculty voice may lead to top-down governance, undermining institutional ownership and morale.

3. Federalism Concerns

- ISI is currently a society registered under a State legislation (West Bengal Societies Act).
- Dissolving the society and bypassing state jurisdiction is seen as:
  - Against cooperative federalism
  - Violating the earlier agreement between the ISI Society and the Union Government

4. Interference in Appointments

- The Bill allows the Union Government-controlled BoG to oversee:
  - Faculty appointments

  - Director selection
  - Staff recruitment
- Fear: Political interference, weakening merit-based academic recruitment.

5. Funding Model and Revenue Generation Concerns

Section 29 of the draft Bill permits the ISI to generate revenue via:

- Higher student fees
- Consultancy services
- Sponsored research projects

Concerns:

- Push toward a corporate funding model may:
  - Divert attention from basic, long-term research (ISI's core strength)
  - Make the institute financially dependent on external projects
  - Reduce accessibility for students from economically weaker backgrounds

6. Loss of Historical Identity

- ISI has a storied legacy shaped by P.C. Mahalanobis and linked to the Bengal Renaissance.
- Critics argue that dissolving the Society status erodes historical and institutional continuity.

Government's Position and Counter-Arguments

MoSPI maintains that:

- The Bill modernises ISI's governance for global competitiveness
- Reforms are based on expert recommendations (including Mashelkar report)
- Statutory status will improve efficiency, transparency, and accountability
- Expansion of academic programmes and enhanced research output is the ultimate goal

Impact on ISI's Revenue-Generating Mechanisms

If the Bill is enacted:

Positive possibilities:

- Greater flexibility in raising funds
- Opportunity to scale collaborations, consultancy, and industry partnerships

Negative implications (as feared by ISI community):

- Commercialisation pressures
- Reduced focus on pure and fundamental research, which may not yield immediate financial returns

- Increased student fees → decreased accessibility
- Research agenda influenced by sponsors rather than academic freedom

Conclusion

The draft ISI Bill, 2025 represents a significant shift in the governance architecture of one of India's most revered institutions. While the Government argues that statutory status and a new governance model will strengthen ISI's global standing, critics fear it may undermine autonomy, dilute academic freedom, and centralise control. The debate reflects a larger national conversation on how to reform institutions of national importance while preserving their independence, creativity, and research ethos. What happens next will depend on Parliamentary deliberation, stakeholder engagement, and the political climate surrounding the Bill.

UPSC Prelims Practice Question

Ques : **Consider the following statements regarding the draft Indian Statistical Institute (ISI) Bill, 2025:**

1. The Bill proposes to convert the ISI from a registered society into a statutory body corporate.
2. Under the draft Bill, the Board of Governors includes significant representation from ISI faculty and students.
3. The Bill repeals the Indian Statistical Institute Act, 1959.

Which of the statements is/are correct?

A. 1 and 2 only

B. 2 and 3 only

C. 1 and 3 only

D. 1, 2 and 3

Ans : c)

UPSC Mains Practice Question

Ques : Examine the implications of replacing the existing ISI Council with a government-dominated Board of Governors as proposed in the draft ISI Bill, 2025. How may this affect institutional governance and research independence? **(150 words)**

Page : 08 : Editorial Analysis

A black Friday for aviation safety in India

In the aftermath of the crisis in India's aviation after private airline Indigo cancelled flights, the Minister of Civil Aviation posted on X, the following: "The FDTL [Flight Duty Time Limitations] orders issued by [the] DGCA have been placed under abeyance with immediate effect for now to stabilize operations and prioritise relief for affected passengers." Prior to this, , the Directorate General of Civil Aviation (DGCA) had issued an appeal to pilots' associations and pilots to cooperate and ensure that flights were back without delays, with a subtle direction to dilute the FDTL (a Civil Aviation Requirement (CAR) to comply with a High Court order). These acts, by the Minister and the DGCA, make a mockery of flight safety and make India the laughing stock as far as aviation safety is concerned. The commercial interests of Indigo have taken priority over crew fatigue and the safety of passengers. CARs have been modified to suit commercial aviation's requirements. Safety be damned.

The dilution of a good safety measure

In 2007, the DGCA issued a very good CAR, addressing the issue of fatigue and the rest period of operating crew. But airline owners complained to the Minister, who issued orders to the DGCA to keep the CAR in abeyance In an order dated May 29, 2008, the DGCA wrote: "The competent authority in the Ministry of Civil Aviation has decided to keep CAR Section 7, Flight Crew Standards, Series J, Part III dated 27th July, 2007 in abeyance". In 18 years, the mindset continues to favour the commercial interests of airlines and ignoring the dangers of fatigue and inadequate rest periods of crew.

The pilots association filed a writ in the Bombay High Court (Writ petition 1687 of 2008) against this order. The High Court granted interim relief and slammed the aviation authority for putting the lives of pilots and passengers at risk. The Court pulled up the Aviation Ministry and the DGCA for arbitrarily and irrationally playing with the duty hours (flying hours) of pilots. "To overcome the acute shortage of pilots, the authorities and airlines should decrease the number of flights and not increase the pilots' duty hours," the High Court observed. It said, "It is apparent that [the] safety of flights has been overlooked for protecting the financial interests of a few airline operators. The ministry in charge is duty-bound to protect the safety of pilots and passengers." Strangely, it was the same High Court that reversed the order and upheld the action of the Civil Aviation Ministry.

The owner of Indigo knew, for more than a year, that the new regulations would kick in from November 1, 2025. The DGCA was also aware of this deadline. Yet, both were in deep slumber that resulted in chaos across India with thousands of passengers stranded. They may get refunds for cancelled flights but who will compensate them for the losses incurred on expenses such as hotels and transportation arrangements?

The malaise can be directly connected with the DGCA's CAR Series 'C' Part II Section 3 Air Transport dated April 19, 2022. It says: "The applicant shall have on his regular employment sufficient number of flight crew and cabin crew but not less than three sets of crew per aircraft. The flight crew should hold current licences issued by [the] DGCA with appropriate endorsements of the type of aircraft operated. The cabin crew should have appropriate authorization/endorsements as per the requirements of [the] DGCA".

No accountability

Even with the existing, but unsafe, FDTL and rest period rules that were in existence, one needs a minimum of six sets of pilots an aircraft for domestic operation and not less than 12 sets of pilots an aircraft for widebody, long haul operations. Airlines appear to have taken advantage of the CAR and, deliberately, underemployed qualified sets of crew. Indigo appears to be a major player in this misuse. The judiciary has shown a total disregard for aviation safety and has been playing second fiddle to the government for more than 20 years.

In 2006, the International Civil Aviation Organization (ICAO) had identified in its audit report the need for India to have an independent civil aviation authority and not a puppet regime under the control of the government. Almost 20 years later, this has been proved right with the complete lack of safety oversight by the DGCA over the past few years and the arrogance of airline owners to flout safety norms, knowing well that the government and the DGCA will look the other way. On December 5, 2025, there was graphic proof of this. As referred to earlier, the DGCA issued an appeal for "... full cooperation of all pilot bodies, associations and pilots across India." A few hours later, the Aviation Ministry issues an order keeping in abeyance the CAR on FDTL and rest period, mandated by the High Court. Even third world countries would not dilute safety norms to this extent. The order even mentions February 10, 2026 as the outer limit. Indigo has not complied with even one clause of the earlier CAR enforced by the High Court, for more than a year. One has to be naive to believe that the airline will follow the rules in two months. We can expect further extensions and a compromise as far as safety is concerned.

No lessons learnt

There have been three major aircraft accidents in India since 2010 (Mangaluru, Kozhikode and Ahmedabad). The findings of the Air India AI 171 crash in Ahmedabad are being delayed by the Ministry for reasons it knows best. The CEO of Indigo says that operations should become normal in 10 to 15 days. Meanwhile, safety is plummeting to its nadir. The saying, "on a wing and prayer", will be the dominant factor in the Indian skies. The Minister, the DGCA and airline owners will repeat, ad nauseum, that safety is paramount. But the actions on December 5, 2025 prove that aviation safety is still a myth in India.

Captain A. (Mohan) Ranganathan

is a former airline instructor pilot and aviation safety adviser. He is also a former member of the Civil Aviation Safety Advisory Council (CASAC), India

The actions by India's aviation authorities, on December 5, 2025, favouring a private airline, prove that flight safety is still not a serious issue

GS - 2 : Governance

UPSC Mains Practice Question : Critically examine the role of the Directorate General of Civil Aviation (DGCA) in ensuring aviation safety in India. Why is there a growing demand for an independent aviation safety regulator? (250 words)

Context :

India's aviation sector recently witnessed a serious disruption when private airline IndiGo cancelled hundreds of flights, leading to massive passenger chaos. In response, the Ministry of Civil Aviation placed the Flight Duty Time Limitation (FDTL) regulations under abeyance to stabilise operations. This move triggered strong criticism from aviation safety experts, who argue that diluting FDTL norms compromises crew rest, fatigue management, and passenger safety, and reflects a long-standing pattern of prioritising commercial interests over aviation safety.

Key Analysis

1. What are FDTL norms and why are they important?

- FDTL (Flight Duty Time Limitations) regulations set rules for:
  - Maximum daily duty hours for pilots
  - Mandatory rest periods
  - Limits on night flying, continuous operations, etc.
- These norms exist globally to mitigate pilot fatigue, a leading factor in aviation accidents.

Concern: Dilution of FDTL rules directly reduces safety buffers and increases risks of human error in cockpit operations.

2. Why is the current situation being called a "Black Friday" for aviation safety?

(a) Government put safety norms on hold

- MoCA ordered DGCA to keep FDTL rules under abeyance to allow airlines—especially IndiGo—to operate more flights.
- This effectively prioritised commercial operations over crew fatigue and flight safety.

(b) DGCA's appeal to pilots

- DGCA appealed to pilots to "cooperate", subtly pressuring them to fly despite rest concerns.
- Aviation experts call this a serious violation of safety ethics.

3. Historical pattern of diluting safety rules

- In 2007, DGCA introduced an excellent CAR (Civil Aviation Requirement) on crew fatigue management.
- In 2008, under pressure from airline owners, the Ministry ordered DGCA to keep the CAR in abeyance.
- Pilots approached the Bombay High Court, which initially criticised the Ministry for ignoring safety but later reversed its own judgment.

Pattern: Commercial interest → political pressure → dilution of safety norms → judicial leniency.

4. Understaffing of pilots: The real cause of the crisis

DGCA's rules require:

- Minimum 3 sets of crew per aircraft, but that is insufficient for actual safe operation.
- **Safe operations typically need:**
  - 6 sets of pilots per narrow-body aircraft (domestic)
  - 12 sets for wide-body long-haul aircraft

Issue:

Airlines, especially IndiGo, appear to have deliberately under-hired pilots to cut costs, exploiting loopholes in DGCA rules.

Result:

When new FDTL norms were set to take effect on Nov 1, 2025, IndiGo was unprepared—leading to the nationwide crisis.

5. ICAO's long-standing concern: DGCA lacks independence

- In 2006, the International Civil Aviation Organization (ICAO) recommended that India create an independent aviation safety authority.
- DGCA is still under government control, making it susceptible to political and commercial pressure.
- The December 2025 events prove DGCA cannot enforce safety when government or airlines interfere.

6. Delayed accident investigation reports

India has faced three major accidents since 2010:

- Mangaluru (2010)
- Kozhikode (2020)
- Ahmedabad AI-171

The Ahmedabad crash report remains delayed, raising questions about transparency and accountability.

Conclusion by experts: India has not learned from past accidents; safety oversight remains weak.

Conclusion

The events of December 2025 represent a disturbing undermining of aviation safety in India. By suspending FDTL rules and placing commercial concerns over fatigue risk, the Government and DGCA have weakened the regulatory framework that protects both crew and passengers. Chronic issues—such as underemployment of pilots, political interference, lack of an independent regulator, and delayed accident reports—highlight deep structural flaws in India's aviation governance system. Unless reforms ensure independent oversight, strict enforcement, and accountability, aviation safety in India will remain vulnerable, relying "on a wing and a prayer" rather than robust safety systems.