EDITORIAL

DATE : 23rd July

Aviation Safety in India: A National Imperative

Syllabus Mapping:

- **GS Paper 3** – Disaster Management, Infrastructure
- **GS Paper 2** – Governance, Regulatory Bodies
- **Essay Paper** – Public Safety, Accountability, and Urban Infrastructure

1. Introduction

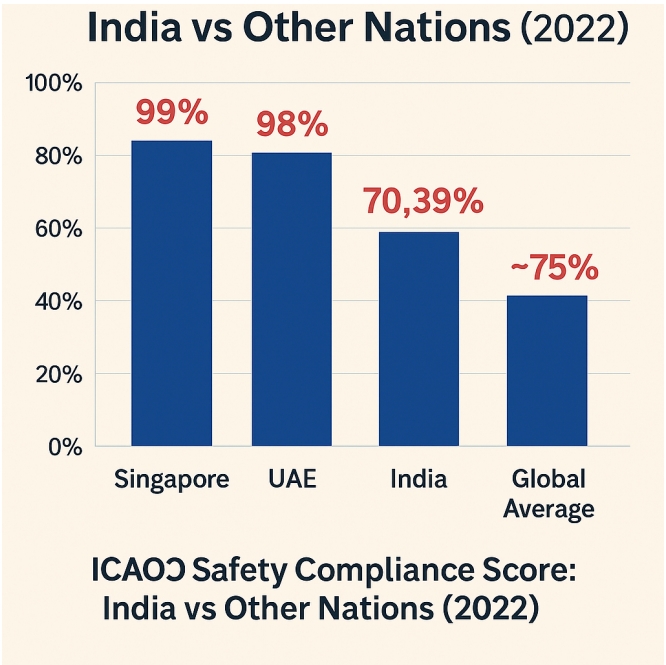
The recent **crash of Air India Flight AI-171 in Ahmedabad (2025)** has highlighted the systemic gaps in India's civil aviation safety architecture. While India boasts rapid aviation growth, this expansion has not been matched by institutionalised safety, regulatory autonomy, or infrastructure modernisation.

2. Current Status of the Aviation Sector

- India is the **third-largest domestic aviation market** (after US and China)
- Expected to carry **520+ million passengers annually by 2037** (IATA)
- Operates **140+ airports**, with major upgrades under **UDAN Scheme**
- Dominated by **IndiGo, Air India (Tata-owned), Vistara**
- Regulated by the **DGCA**, a statutory body under the Civil Aviation Ministry

3. Key Findings from DGCA Surprise Audits

Area	Issues Identified
Outdated Infrastructure	Faded runway markings, poor lighting, old navigation systems
Technical Oversight	Aircraft cleared despite unresolved issues
Ramp and Ground Handling	Unsafe refuelling, worn-out equipment
Urban Encroachment	Airports like Ahmedabad surrounded by dense settlements
Hygiene & Medical Concerns	Cases like AI-130 raise fears of decompression, food contamination



4. Structural Issues in Regulation

- **Weak DGCA Autonomy** – Subject to bureaucratic control, lacks enforcement independence
- **Manpower Deficit** – ~400 officers for 700+ aircraft; well below ICAO norms
- **Reactive Oversight** – Acts after incidents, lacks predictive analytics

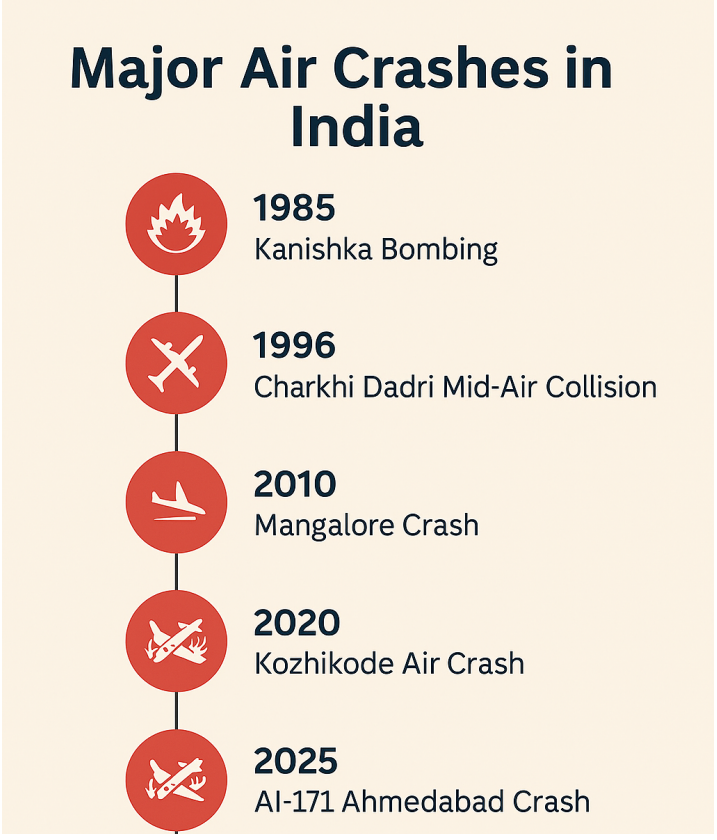
5. Consequences of Safety Lapses

- **Human Cost:** Ahmedabad crash is one of India's worst in decades
- **Public Trust Deficit:** Passengers fear boarding after recurring lapses
- **Economic Fallout:** Flight cancellations, insurance premium hikes
- **Global Reputation:** Regulatory downgrades damage India's credibility

6. Case Study: AI-171 Crash (Ahmedabad, July 2025)

- **Cause**: Preliminary inquiry suggests a combination of **navigation failure, poor visibility, and runway lighting malfunction**.
- **Casualties**: 130+ passengers and crew lost; significant damage to property due to nearby slum encroachment.
- **Implications**: Raised questions on **airport disaster management preparedness**, pilot rest standards, and maintenance procedures.

This incident has become a **defining moment**, pressing for a structural overhaul of India's aviation safety strategy.



7. Root Causes – Aviation Safety Challenges in India (Short Notes)

- **Obsolete Infrastructure**: Many airports were built decades ago and lack modern safety systems (e.g., outdated navigation aids, poor runway lighting).
- **Urban Encroachment**: Densely populated surroundings restrict safety buffers, increasing casualty risk during crashes.
- **Pilot & Crew Fatigue**: Inadequate rest hours, unregulated flying schedules, and undertrained ground staff lead to operational risks.
- **Privatisation Gaps**: While operations have improved, safety oversight has not kept pace, especially in private carriers.
- **Low R&D in Safety Tech**: Limited investment in predictive safety tools, diagnostics, and indigenous aviation safety research.

8. Key Steps Taken So Far

INITIATIVE	PROGRESS & LIMITATIONS
UDAN SCHEME	Aimed to connect underserved regions and boost regional connectivity. However, safety aspects—like emergency response systems, weather monitoring, and staff training—have largely been overlooked during implementation.
DGCA E-GCA PORTAL	Introduced to digitize regulatory functions such as pilot licensing, approvals, and audits. While it improves transparency and record-keeping, it is yet to fully integrate predictive risk analytics or real-time inspection modules.
ADS-B ROLLOUT	The Automatic Dependent Surveillance–Broadcast (ADS-B) system is being deployed to enhance airspace surveillance and tracking. This will help reduce collision risks, especially in congested skies, but its adoption is incomplete across rural and tier-2 airports.
AAI MEASURES	The Airports Authority of India has initiated **runway resurfacing, lighting improvements, and signage upgrades** in select high-traffic airports. However, these efforts are patchy and not guided by a unified national safety audit framework.

9. Legal and Ethical Dimensions of Aviation Safety in India

1. Constitutional Mandate – Article 21

- **Article 21** ensures the *Right to Life*, which includes the right to **safe travel**.
- Negligence in aviation safety (e.g., faulty aircraft, poor infrastructure) can be construed as a **violation of this fundamental right**.
- Supreme Court judgments have emphasized the **State's duty** to ensure safe public utilities.

2. Disaster Management Act, 2005

- **Section 35 & 36** empower the Centre and Ministries to frame and enforce **aviation safety norms**.
- Treats **air crashes** as *man-made disasters* requiring:
  - **Prevention, preparedness, audits**, and emergency response.
  - Mandatory **disaster mitigation plans** by the Ministry of Civil Aviation.

3. Ethical Obligations

- Based on the principle **"Do No Harm"**, safety is a **moral obligation** of all stakeholders.
- Recent cases (e.g., AI-171 crash) show **neglect in aircraft maintenance and airport safety**—reflecting not just regulatory lapses but **ethical failure**.
- Airlines and regulators must **prioritize human life over profit motives**.

10. Comparative Best Practices in Aviation Safety

1. United States – Federal Aviation Administration (FAA)

- **Regulatory Autonomy**: Operates independently and reports directly to the **US Congress**, not the executive.
- **Robust Certification Protocols**: Mandates stringent pilot licensing, aircraft airworthiness checks, and airport inspections.
- **Transparent Reporting System**: Maintains public databases for safety violations, accident investigation outcomes, and audit records.
- **Proactive Enforcement**: Penalizes carriers with poor safety records; emphasizes continuous compliance over reactive inspections.

2. European Union – European Union Aviation Safety Agency (EASA)

- **Pan-European Coordination**: Acts as a **central authority** for all EU countries, ensuring uniform safety regulations.
- **Cross-border Harmonization**: Standardizes safety norms across diverse jurisdictions (member states), avoiding regulatory gaps.
- **Collaborative Auditing**: Conducts **joint inspections and monitoring missions** with national aviation authorities.
- **Legally Binding Directives**: Issues safety directives with enforcement powers across all EU member nations.

3. Singapore – Civil Aviation Authority of Singapore (CAAS)

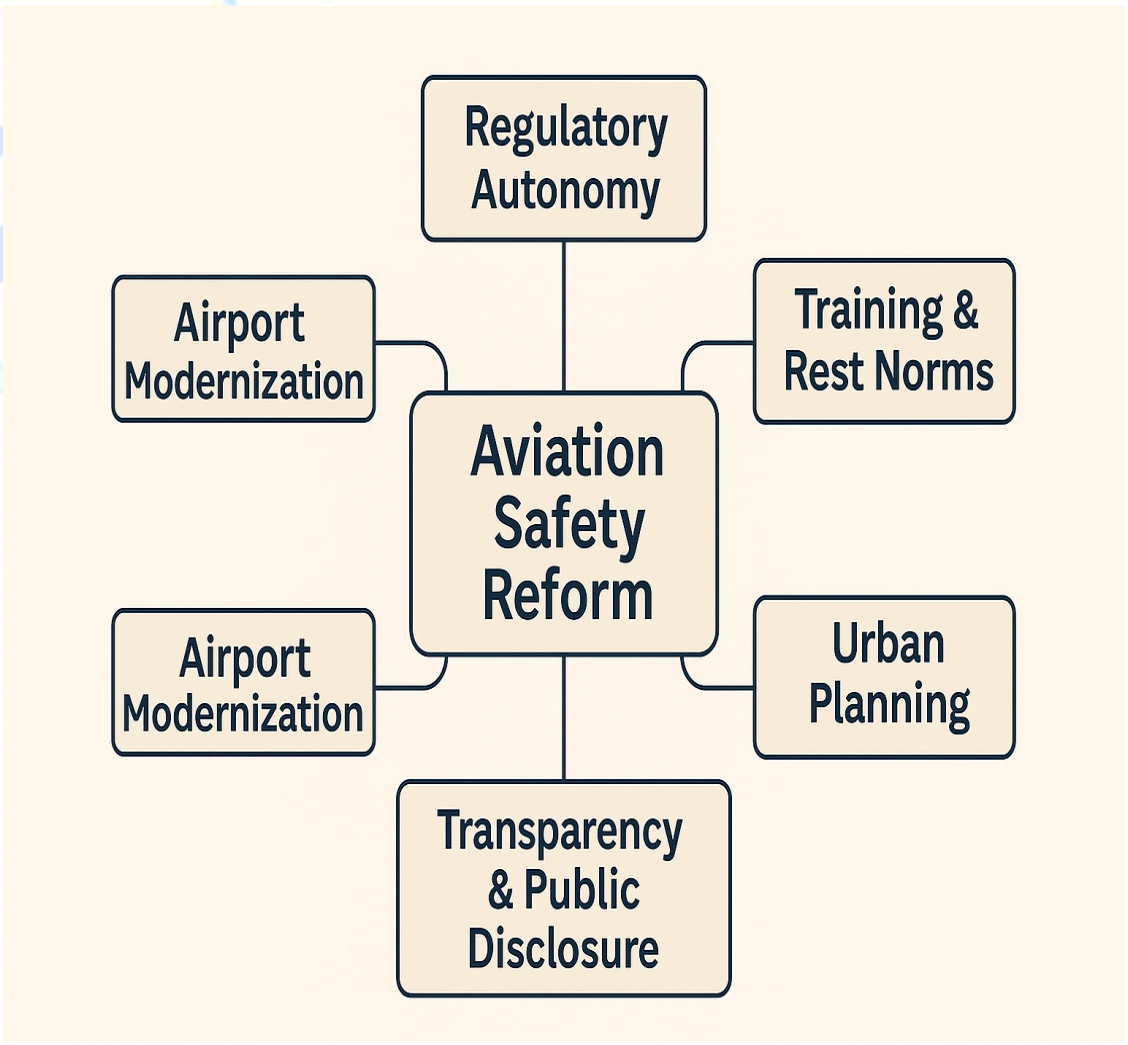
- **AI-based Predictive Audits**: Uses **artificial intelligence and data analytics** to identify risk-prone aircraft, routes, or carriers.
- **Highest ICAO Score**: Achieved **99% safety compliance** (ICAO USOAP 2022), the global benchmark.
- **Real-time Monitoring Systems**: Live diagnostics on aircraft performance, maintenance needs, and crew fitness.
- **Risk-based Inspections**: Audits prioritized based on route sensitivity, past incidents, and seasonal weather risk.

📌 Lessons for India

To align with global standards, India must:

- **Grant full autonomy** to DGCA (like FAA),
- **Standardize regional safety norms** across states and airports (like EASA),
- **Invest in AI-driven predictive monitoring systems** (like Singapore),
- Promote **transparent reporting** and publish airline safety rankings publicly.

11. Way Forward



A. Institutional Reforms

- Convert DGCA into **autonomous aviation authority**
- Draft and implement **National Aviation Safety Act**

B. Predictive Oversight

- Use **AI and Big Data** to monitor real-time vulnerabilities
- Conduct **quarterly surprise safety audits**

C. Infrastructure Modernisation

- GPS-based navigation, lighting, safety corridors
- Mandatory **zoning laws** around all major airports

D. Crew Training and Human Capital

- Certified training for pilots, ATC, and ground staff
- Enforce crew rest hours and health protocols

E. Transparency and Public Safety

- Publish airline safety rankings, audit reports
- Joint regulation by **DGCA and FSSAI** for food hygiene

F. Urban Planning Reform

- Redesign airports in urban cores (Ahmedabad, Mumbai)
- Collaborate with state governments for **zoning clarity**

G. Global Collaboration

- Seek capacity-building help from **ICAO, FAA, EASA**

12. Conclusion

India's ambition of becoming an **aviation hub of the Global South** will remain incomplete without prioritising air safety. The recent crash should serve as a wake-up call. A systemic transformation involving **legal reform, regulatory independence, and technological integration** is urgently required.

Safety in aviation is not just a technical issue—it is a matter of national accountability and international reputation.

UPSC Mains Practice Questions

1. **"India's aviation infrastructure is not keeping pace with its rapid expansion." Critically analyse in the context of recent air accidents.**
2. **Evaluate the role of regulatory autonomy in ensuring air safety in India.**
3. **Discuss the legal, ethical, and institutional imperatives of aviation safety as a component of national disaster management.**