

The forgotten copilot of Air India flight 171

Prelims: General Studies Paper - 1
Current events of national and international importance

Mains: General Studies - 3
Disaster and disaster management.

1. What are the key facts and concerns regarding the AI-171 crash investigation?

- **Air India Flight AI-171** crashed on **June 12, 2025**, killing **260 people**.
- Only the **Preliminary Report (July 2025)** is available; **final report pending**.
- **Ministry of Civil Aviation (MoCA) and Air Accident Investigation Bureau (AAIB)** deviated from their promise of a **“transparent and factual” investigation**.
- The report is **cryptic**, with key details undisclosed.
- **Families lack closure**, raising concerns of **deliberate delay/concealment**.
- **AAIB chief given X-category security** on **June 16, 2025** based on threat inputs.

2. What technical evidence raises critical questions?

- **Forward Enhanced Airborne Flight Recorder (EAFR)** recovered on **June 16, 2025**.
- The forward EAFR records both flight data and cockpit voice recordings (CVR).
- **CVR recording:** one pilot questioned the other on **fuel cut-off**, response denied action.
- **Fuel Control Switches (FCS)** moved from **“run” to “cut-off” sequentially**.
- **FCS is mechanical (spring-loaded)** .so it **cannot move due to software/power failure**.
- Engine shutdown caused **instrument blackout** and **loss of rear EAFR data**.

3. How have alternative narratives influenced the debate?

- **Media narratives** focus on **FCS transitions** and alleged external influence.
- Attention diverted to **Ram Air Turbine (RAT)** deployment.

The **Ram Air Turbine (RAT)** is a small emergency turbine that deploys from an aircraft to generate **hydraulic and electrical power** when main power systems fail. It is driven by the **airflow during flight** and provides essential power to critical flight controls and instruments.

- **RAT activated before engine shutdown**.
- **RAT deployment (auto/manual)** is recorded in **EAFR & CVR**.
- Claims of **wiring fault** seen as **diversion from FCS issue**.
- Institutional stance shifted from **pilot-blame** → **defending captain**.

4. What conclusions and accountability issues emerge?

- Evidence suggests **deliberate FCS movement by one pilot**.
- **Mechanical design rules out technical malfunction**.
- **First Officer Clive Kunder** handled the crisis, **avoiding greater casualties**.
- **Engine restart delay** due to **loss of instruments & control stress**.
- **The government had key evidence by June 16, 2025**, yet **no full disclosure**.
- Delay affects **credibility of AAIB & DGCA (Directorate General of Civil Aviation)**.
- **Victims’ families still await closure** → need for **transparency and accountability**.

- The government must ensure **time-bound release of the final report, independent expert involvement, and full public disclosure of CVR/EAFR findings** to restore trust and provide closure.

Foreseeable accidents: On the recent industrial accidents in India

Prelims: General Studies Paper - 1
Economic and Social Development-Sustainable Development, Poverty, Inclusion, Demographics, Social Sector Initiatives, etc.

Mains: General Studies - 3
Indian Economy and issues relating to planning, mobilization, of resources, growth, development and employment.

1. Why are the recent industrial accidents in India not merely isolated incidents?

- Recent incidents in **Surat** (septic tank deaths) and **Visakhapatnam** (steel plant explosion) reflect **systemic safety failures**, not random accidents.
- Both industries were already aware of the risks and had established **preventive safety measures**.
- Repeated occurrence of similar incidents indicates a **persistent failure of safety management**.

2. What safety lapses led to the Surat septic tank tragedy?

- Workers entered a **closed space** without proper **safety equipment** and were affected by **toxic gases**.
- The incident followed a common pattern where **unprotected rescuers** also become victims.
- Such deaths are often failures of **basic safety management**, not unforeseeable accidents.

3. What factors may have contributed to the Visakhapatnam steel plant explosion?

Steel plants involve inherent risks due to:

- **Extreme temperatures**
- **Pressurised gases**
- **Heavy machinery**
- Large amounts of **stored heat energy**

Trade unions and former employees alleged:

- **Staff shortages**
- **Increased workloads**
- **Ageing equipment**
- **Deferred maintenance**
- Greater dependence on **contract labour**

4. What broader structural issues do these incidents highlight?

- Major industrial disasters usually result from an accumulation of **organisational weaknesses**.
- **Contract workers** often face higher risks due to:
 - ➔ Inadequate **training**
 - ➔ **Fragmented accountability**
 - ➔ **Poorer safety oversight**
 - ➔ Some observers also linked these issues to the challenges faced by the plant following the Centre's **divestment plans**.
 - ↳ These developments reportedly resulted in **financial constraints** and **reduced investments**, limiting the upgrading of **safety infrastructure** and **maintenance systems**.
- The incidents expose deeper challenges in Indian industry:
 - ➔ **Manpower shortages**
 - ➔ **Caste- and class-based concentration** in hazardous jobs
 - ➔ Uneven implementation of the new **occupational safety framework**
 - ➔ A persistent **"cost over safety" mindset** in financially stressed industries.

The reality behind falling net FDI

Prelims: General Studies Paper - 1
Current events of national and international importance

Mains: General Studies - 2
Indian Economy and issues relating to planning, mobilization, of resources, growth, development and employment

1. Why has India's Net FDI Declined Sharply in Recent Years?

Foreign Direct Investment (FDI) is an investment made by a foreign company or individual in a business located in another country with the aim of establishing a lasting interest, management control, or significant ownership.

- **India's net FDI fell from \$44 billion in 2020-21 to less than \$1 billion in 2024-25**, before recovering to \$7.6 billion in 2025-26.
- **Net FDI is calculated after adjusting for capital repatriation and investment outflows.**

Capital repatriation is the withdrawal and transfer of investment capital by foreign investors from the host country to their home country.

- The **decline is mainly due to disinvestment and capital withdrawals**, not profit remittances.
- **Gross FDI inflows remained strong at \$94.6 billion** in 2025-26.
- The debate often **focuses only on total FDI numbers and ignores the different types of foreign investments** and their impact on India's Balance of Payments (BoP).

2. What are the Different Types of FDI in India?

- **Real FDI (RFDI)** refers to investments made by multinational companies that establish production units or service facilities and bring technology and skills to the host country.
- **Financial FDI** consists of investments by private equity funds, venture capital firms, sovereign wealth funds, and asset managers whose primary objective is earning returns and exiting after a certain period.
- **Diaspora and SPV-based FDI** includes investments made by overseas Indians and Special Purpose Vehicles (SPVs) that channel funds through offshore financial centres.
- During 2022-23 to 2025-26, Real FDI accounted for 41.9% of India's effective FDI inflows.
- Financial investors contributed 40.5%, while diaspora and SPV investments accounted for the remaining 17.6% of effective inflows.

3. Why is Low Net FDI a Concern for India?

- **Manufacturing-related Real FDI has steadily declined** over the last three four-year periods.

- RFDI in manufacturing formed only 10.6% of total effective inflows in the latest period.
- Many reported FDI inflows **result from ownership changes, mergers, share swaps, and debt-to-equity conversions, not fresh capital.**
- **Financial investors often exit after earning profits**, leading to large capital outflows

4. What are the Major FDI Outflow Channels and Their Implications?

- Between 2022-23 and 2025-26, disinvestment and capital repatriation totalled \$178.9 billion.
- Royalty and intellectual property payments reached \$46.6 billion.
- **For every \$1 of fresh FDI inflow, about \$1.50 flowed out** through various channels.
- Experts argue that **India needs to assess FDI based on quality, technology transfer, industrial growth, and long-term sustainability**, not just total inflows.

KEYWORDS

Global Navigation Satellite System (GNSS)

- The Ministry of Defence signed a ₹449 crore contract for the procurement of 20 enhanced-capability GNSS jammers for the Indian Navy.
- A Global Navigation Satellite System (GNSS) is a **space-based satellite network that provides precise positioning, navigation, and timing (PNT) services worldwide.**
- GNSS determines a user's location, speed, and time using signals from multiple satellites through a process called trilateration.
- It consists of three segments: the Space Segment (satellites), Control Segment (ground stations), and User Segment (receivers).
- The **four fully operational global GNSS constellations are GPS (United States), GLONASS (Russia), Galileo (European Union), and BeiDou (China).**

PCSK9 gene

- The **PCSK9 gene** contains instructions for producing the **PCSK9 protein**, which helps regulate the level of **cholesterol** in the bloodstream.
 - ➡ Cholesterol is a **fat-like substance** that is both produced by the body and obtained from **animal-based foods**.
- The **PCSK9 protein** regulates the number of **low-density lipoprotein (LDL) receptors** present on the surface of cells.
 - ➡ These receptors are essential for removing **LDL cholesterol ("bad" cholesterol)** from the blood and maintaining healthy **cholesterol levels**.

Lipoproteins

- **LDL** and **HDL** are two types of **lipoproteins**, which are combinations of **fats (lipids)** and **proteins**.
- Lipids are attached to proteins so that they can be transported through the **bloodstream**.
 - ➡ **LDL (Low-Density Lipoprotein)** is often called "**bad cholesterol**" because high levels can cause **cholesterol deposits** to build up in the **arteries**, increasing the risk of cardiovascular diseases.
 - ➡ **HDL (High-Density Lipoprotein)** is known as "**good cholesterol**" because it carries excess **cholesterol** from different parts of the body back to the **liver**, where it can be processed and removed.

'Vinimay'

- '**Vinimay**', the **Land Port Management System (LPMS)**, is a **digital platform** developed to modernise operations at India's **land ports** and enhance coordination among various **border management agencies**.
- The system aims to facilitate smoother **cargo** and **passenger movement** while strengthening **border security** and **trade management**.

- It enables **real-time coordination** among **Customs, Immigration authorities, border guarding forces**, and other agencies involved in land port operations.
- The **LPMS** serves as a **unified digital platform** that integrates activities across India's land ports.
- It allows the **secure and real-time exchange of logistics and regulatory information**, similar to the digital systems already functioning at **airports** and **seaports**.

Species in News

Axolotl

- The **axolotl** (pronounced ah-sho-LO-tul) has become the **unofficial mascot of Mexico City** as the city prepares to host five matches during the FIFA World Cup 2026.
- It is a **unique species of salamander found naturally in Lake Xochimilco**.
- It is famous for its extraordinary ability to **regenerate lost limbs, parts of the heart, spinal cord, and even sections of the brain without permanent scarring**.
- Unlike most amphibians, it **remains underwater throughout its entire life and retains its larval characteristics** into adulthood.
- The **Mexican Axolotl** is listed as **Critically Endangered (CR)** on the **International Union for Conservation of Nature Red List** due to habitat loss, water pollution, invasive species, disease, and climate change.



Places in news

Port of Duqm



- Recent tensions in the **Gulf of Oman** involved vessels **reportedly held by the U.S. Navy off the coast of Duqm**
- It is an **Arabian Sea port in Oman**, managed as a **50:50 joint venture** between **Oman’s Asyad Group** and **Belgium’s Consortium Antwerp Port**.
- With an **18-meter draft**, it has the capacity to handle **3.5 million TEU (Twenty-foot Equivalent Unit)** of containers and **25 million tonnes of dry bulk annually**.
- It anchors the **2,000 sq km Special Economic Zone at Duqm (SEZAD)**, which includes a **major oil refinery**.
- The facility features **two world-class dry docks** capable of **repairing 100+ large vessels per year**.
- Located **outside the Strait of Hormuz**, it provides a **secure shipping gateway** that **bypasses critical regional chokepoints**.

Port of Sohar

- Recent tensions in the **Gulf of Oman** involved a **commercial tanker catching fire 20 nautical miles northeast of Sohar**
- Located **just outside the Strait of Hormuz**, it is a **50:50 joint venture** between **Oman’s Asyad Group** and the **Port of Rotterdam**.

- The port handles **massive traffic**, with **3,000+ vessel calls** and around **85 million gross registered tonnage annually**.
- Operations are divided into **specialized clusters** for **logistics, petrochemicals, metals, and agricultural bulk**.
- It uses **advanced technology**, including **maintenance drones** and **remote-controlled gantries** for **ultra-large container ships**.
- The port deploys a **regional-first digital platform “SOHAR Navigate”**, connecting to **550+ global ports**

