

Today's Prelims Topics

Historic Gold Price Surge in India

Context

Recently the price of **24-karat gold** has touched **₹1,01,350 per 10 grams**. This is the **first time** gold prices in India have breached the **₹1 lakh mark**.

Key Drivers Behind the Surge in Price

- **Weakening U.S. Dollar:**
 - The **U.S. Dollar Index (DXY)** dropped to a **three-year low below 98**.
- **Treasury Bond Sell-Offs:**
 - Investors sold U.S. Treasury bonds, seeking **higher returns and safety**, moving capital to gold.
- **India's Position in Gold Market:**
 - India is the **second-largest gold consumer** globally (after China).
 - **Around 85% of India's gold is imported**, making domestic prices highly sensitive to international trends.
- **U.S.-China Trade Tensions:**
 - Ongoing Tariff war between US and China. This renewed **geo-political tension** triggered **safe-haven buying**.
- **Federal Reserve Pressure:**
 - US President **Donald Trump** unveiled plans to **overhaul the US Federal Reserve**.
 - Trump's statements **shook investor confidence**, contributing to:
 - **Dollar devaluation & A rise in safe-haven demand for gold.**
- **Strong Central Bank Buying:**
 - Ongoing purchases by China and other central banks signal: **Long-term confidence in gold & Strategic reserve accumulation.**

About Dollar Index

- **Dollar Index (DXY)** is a measure of the value of the U.S. dollar relative to a basket of foreign currencies.
- **Basket of Currencies:** DXY compares the U.S. dollar against six major currencies:
 - **Euro (EUR)** – 57.6% (highest weight)
 - **Japanese Yen (JPY)** – 13.6%
 - **British Pound (GBP)** – 11.9%
 - **Canadian Dollar (CAD)** – 9.1%
 - **Swedish Krona (SEK)** – 4.2%
 - **Swiss Franc (CHF)** – 3.6%
- **Base Year and Calculation:** It was established in **1973**, shortly after the Bretton Woods Agreement was dissolved with a base value of **100**.
- **Factors Influencing DXY:**
 - **Monetary Policy:** U.S. Federal Reserve interest rate changes.
 - **Economic Indicators:** GDP growth, employment rates, inflation.
 - **Global Events:** Wars, recessions or financial crises impact the index.

Relationship Between Dollar Index and Gold

- **Gold is priced in U.S. dollars** on the international market.
- When the **dollar weakens:**
 - It takes **more dollars to buy the same amount of gold**.

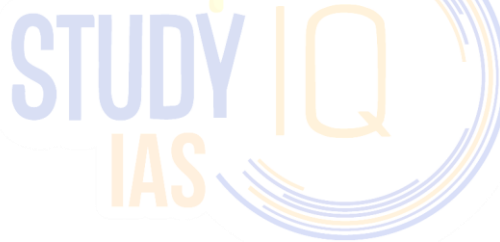
- Investors **seek gold** as a hedge against currency devaluation.
- Global buyers find **gold cheaper**, boosting demand.
- **Current Scenario:**
 - The **Dollar Index has fallen below 98** ▶ Gold **more attractive asset**, contributing to the price rise.

India's Gold Reserves

- RBI holds **854.73 metric tonnes of gold**, of which 510.46 metric tonnes were held domestically & 324.01 metric tonnes of gold were kept in safe custody with the **Bank of England and the Bank for International Settlements (BIS)**.
- As of September 2024, the share of gold in the total foreign exchange reserves is about **9.32%**.
- **Top Gold Reserve Holding Countries:**
 - United States (8,133.46 tonnes)
 - Germany
 - Italy
 - France
 - India (**8th**)
- **Top Gold Producers:** China, Australia, Russia, Canada, USA.
- **Karnataka is the largest producer of gold in India.**
 - **Hutti Gold Mines** (Karnataka) is the only producer of primary gold in the country

Source:

- [Indian Express - Gold price Surge](#)
- [The Hindu](#)



Development of Buffer Zones in Tiger Reserves

Context

Recently the Madhya Pradesh government has approved a scheme for developing buffer zones in the State's nine tiger reserves.

Key Features of the Scheme

- **Chain-Link Fencing:** Installation in ecologically sensitive buffer areas to prevent human-wildlife conflicts.
- **Habitat Development:** Creation of grasslands and water resources to support wildlife.
- **Wildlife Protection Measures:** Implementation of fire safety protocols and health monitoring for wild animals.
- **Community Engagement:** Skill development training programs for local communities to promote sustainable livelihoods and involvement in conservation efforts.
- Madhya Pradesh is the "**Tiger State**" of India. It has witnessed a significant increase in its tiger population within buffer zones:
 - **2019:** 526 tigers
 - **2023:** 785 tiger

Tiger Reserves in Madhya Pradesh

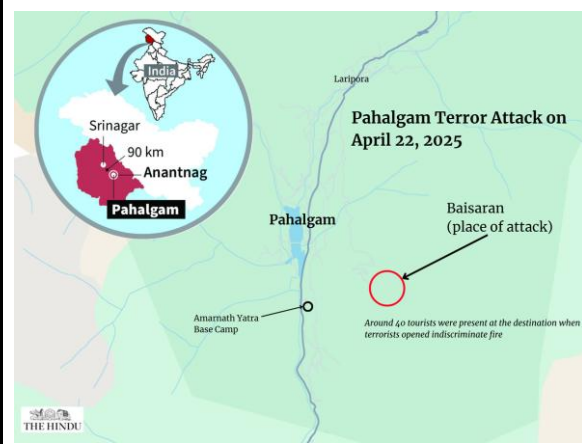
1. Kanha Tiger Reserve
2. Bandhavgarh Tiger Reserve
3. Pench Tiger Reserve
4. Satpura Tiger Reserve
5. Panna Tiger Reserve
6. Sanjay-Dubri Tiger Reserve
7. Ratapani Tiger Reserve
8. Veerangana Durgavati Tiger Reserve
9. Madhav Tiger Reserve

Source:

- [The Hindu - Tiger Reserves](#)

Places in News

Baisaran Valley



- **Location:** About **5 km from Pahalgam town**, accessible only by foot or pony.
- It is encircled by **dense pine forests and snow-capped peaks**.
- It is nicknamed as **Mini Switzerland** for its alpine meadows and European landscape-like scenery.
- **Pahalgam is located in Anantnag district.** It is known as the **“Valley of Shepherds**.

Source:

- [Indian Express - Baisaran Valley](#)

Fiscal Slippage

- In a recent interaction with the Indian Diaspora, the Union Finance Minister has stated that the government's debt is being managed well and the fiscal deficit will not slip out of control.

What is Fiscal Slippage?

- **Fiscal slippage** refers to a **deviation from the government's targeted fiscal deficit** — when the **actual fiscal deficit exceeds the budgeted or projected level**.
- Fiscal Deficit = **Total Expenditure** – (Revenue Receipts + Non-debt Capital Receipts)
 - It shows how much the government needs to borrow to meet its expenses.
- **What Causes Fiscal Slippage?**
 - Revenue Shortfall ▶▶ Lower-than-expected **tax revenues**
 - Higher Expenditure ▶▶ Rise in **subsidy bills**, Increase in **interest payments etc.**
 - External Shocks ▶▶ **Global recession**, war, or pandemic (covid-19) etc.

Implications of Fiscal Slippage

- **Increased Government Borrowing:**
 - It can lead to **higher interest rates** in the economy (crowding out private investment).
▶▶ High **debt-to-GDP ratio**.
- **Pressure on Credit Rating:**
 - Global agencies like **Moody's or S&P** may downgrade India's sovereign rating.
- **Inflation Risk:**
 - If deficit is financed via **monetary expansion** (printing money) ▶▶ it can cause **inflation**.
- **Loss of Investor Confidence:**
 - May discourage **foreign investment** and raise concerns about macroeconomic stability.

Source:

- [Business Standard - Fiscal Slippage](#)

Comprehensive Remote Sensing Observation on Crop Progress (CROP)

- ISRO has estimated that India's wheat production from eight major wheat-producing states will reach 122.724 million tonnes as of March 31, 2025, by using advanced satellite-based remote sensing technologies.

About CROP

- CROP is a semi-automated and scalable framework developed by **ISRO's National Remote Sensing Centre (NRSC)**.
- It provides a real-time view of the sowing, growth and harvest progress of crops, especially wheat during the Rabi season.
- It uses **data from Multiple Satellite Data Sources**:
 - **EOS-04 (RISAT-1A)** – Synthetic Aperture Radar (SAR)
 - **EOS-06 (Oceansat-3)** – Ocean and terrestrial observation
 - **Resourcesat-2A** – Multispectral imaging (optical data)
- The eight primary wheat-growing states covered by the ISRO study are **Uttar Pradesh, Madhya Pradesh, Rajasthan, Punjab, Haryana, Bihar, Gujarat and Maharashtra**.

Source:

- [The Hindu - CROP](#)

Salami Slicing

- China is using Salami Slicing tricks in the **Yellow Sea** to capture new territory.

About Salami Slicing

- It is a geopolitical tactic involving the **gradual, incremental encroachment** of disputed territory or maritime zones without provoking full-scale conflict.
- The term was coined by **Stalinist dictator Mátyás Rákosi** during the 1940s.
- China is using this technique in **Yellow Sea**:
 - China uses **civilian structures, coast guard** actions, and **non-military means** to:
 - Slowly **assert control & Avoid** triggering a **military response**
- A similar strategy was used in the **South China Sea** (e.g., **Spratly Islands, Scarborough Shoal**).
- **Yellow Sea bordering countries**: China, North Korea and South Korea.



Source:

- [Eurasian Times - Salami Slicing](#)

Sunrise Sectors

- The Union Finance Minister stated that India aims to double the share of manufacturing in GDP to 23% helped by sunrise sectors.

What are Sunrise Sectors

- Sunrise sectors are industries in their early stages of development that are expected to experience rapid growth and have a significant impact on the global economy.

- **Key Characteristics of Sunrise Sectors:**

- High growth potential
- Innovation driven
- Investment Attractions
- Emerging Startups

Examples of Sunrise Sectors:

- **Clean Energy:** Solar, wind, green hydrogen and other renewable energy technologies.
- **Semiconductors & Electric Mobility:** Electric vehicle manufacturing and battery technologies.
- **Digital Technologies:** Artificial intelligence, blockchain, quantum computing and cybersecurity.
- **Biotechnology:** Genome editing, synthetic biology, and related fields.
- **Space Tourism:** Commercial space travel and related industries.
- **Food Processing:** Industries that transform agricultural products into ready-to-eat or packaged goods.

Source:

- [The Hindu - Sunrise sectors](#)

National Environmental Engineering Research Institute (NEERI)

- The Supreme Court of India has tasked NEERI with assessing the impact of glass industries on Taj Mahal.

About NEERI

- It is a prominent research institute of India, established in 1958 in Nagpur.
- It is a constituent laboratory of the **Council of Scientific and Industrial Research (CSIR), under the Ministry of Science and Technology.**
- It is dedicated to environmental science and engineering.
- NEERI conducts research, offers technical solutions, and shares expertise to improve environmental quality, serving government, industry and society.
- NEERI has five zonal laboratories - **Chennai, Delhi, Hyderabad, Kolkata and Mumbai.**

About Taj Trapezium Zone (TTZ)

- TTZ is a defined area of **10,400 sq km around the Taj Mahal** to protect the monument from pollution.
- It comprises monuments including three World Heritage Sites: **Taj Mahal, Agra Fort and Fatehpur Sikri.**
- It spreads across **Agra, Firozabad, Mathura, Hathras and Etah** districts in Uttar Pradesh and **Bharatpur** district in Rajasthan.

Source:

- [The Hindu - NEERI](#)

Editorial Summary

AI In Weather Forecasting in India

Context

Mission Mausam, launched in September 2024 with ₹2,000 crore over two years, aims to **improve India's weather forecasting** through **enhanced observations, AI-driven models, and better climate data analysis**.

More in News

- The **Ministry of Earth Sciences** has established a dedicated **AI and ML centre** to enhance short-range rain forecasts, create high-resolution urban weather datasets, and use Doppler radar data for real-time rainfall and snowfall prediction.

How AI is Transforming Weather Forecasting

- **Smarter Predictions with Data:** AI systems can study vast amounts of past weather data to **recognize patterns and forecast events** like monsoons, cyclones, and heatwaves—**without relying on the fixed equations used in traditional models**.
 - E.g., A machine learning model developed at IIT Delhi achieved **61.9% accuracy in predicting monsoons (2002–2022)**, outperforming many conventional systems.
- **Faster and Scalable Forecasting:** AI tools can quickly generate **short-term forecasts with lower computing demands**, making them ideal for real-time warnings and nowcasting.
- **Improved Forecasting of Extreme Events:** Because AI can understand complex relationships between different weather variables, it's particularly useful for **predicting rare and sudden events** like flash floods or tornadoes.
- **Blending AI with Traditional Methods:** By combining AI with physics-based models, forecasters can increase both the accuracy and trustworthiness of weather predictions.

Barriers to Using AI in Weather Forecasting

- **Limited and Unreliable Data:** AI needs detailed, clean, and long-term datasets to work well—but weather data, especially in remote areas of India, often has gaps or quality issues.
- **Skill Gap Between Fields:** Meteorologists may not be trained in AI/ML, and many data scientists lack knowledge of atmospheric science—making collaboration difficult.
- **Lack of Transparency:** AI models often function like a “black box,” which can make it hard to explain or justify forecasts to decision-makers.
- **Infrastructure Limitations:** Due to limited local computing power, many weather offices still depend on outputs from global agencies instead of generating their own AI-driven forecasts.
- **Trust and Accuracy Concerns:** Without proper testing and validation, AI forecasts could lead to false alarms or missed warnings, undermining public confidence.

What Needs to Be Done

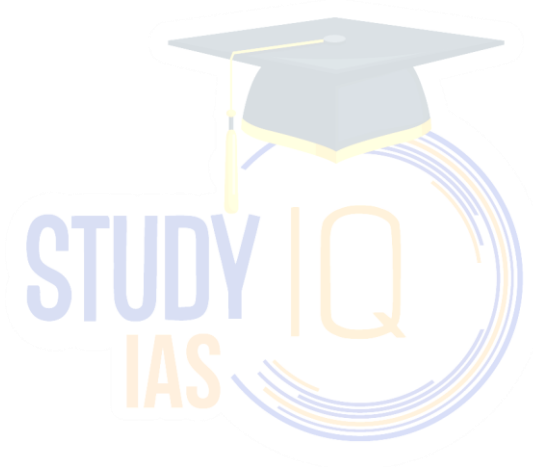
- **Set Up Integrated AI-Weather Centres:** Develop institutions that combine AI expertise with meteorological research under one roof.
 - E.g., The AI and Climate Research Centre at IITM Pune is a step in this direction.
- **Improve Data Systems:** Merge real-time and historic data from radars, satellites, and ground stations into a unified and standardized platform.
- **Train Cross-Disciplinary Experts:** Build a new generation of professionals—meteorologists who understand AI, and AI engineers trained in climate science.
- **Build India-Specific AI Models:** Design forecasting models customized to India's unique geography and climate to offer more localized forecasts.

- **Encourage Collaboration:** Foster partnerships between government agencies, research institutions, and private startups to develop and deploy trustworthy AI models.

Conclusion

AI can play a major role in advancing weather forecasting in India, especially for timely alerts on extreme weather events. However, realizing this potential will require strong data systems, skilled professionals, and close collaboration across sectors. With the right efforts, AI could become a key tool in strengthening India's climate preparedness and resilience.

Source: [The Hindu: AI can supercharge forecasting if it can weather some challenges](#)



Linking Aadhaar with voter ID endangers the right to vote

Context

- There is a renewed push by Election commission of India to link Aadhaar with Voter ID.
 - Some believe that this move endangers the individual right to vote.

Facts

- The right to vote is **not a Fundamental Right** but is a **statutory right**.
- It is mentioned under **Article 326** in the Constitution of India.
- The **61st Constitutional Amendment Act, 1988** reduced the **voting age (21 to 18 years)** in India.

Benefits of Linking Aadhaar with Voter IDs

- **Elimination of Duplicate Voter IDs:** Migration or address changes often lead to duplicate voter registrations. Linking can identify and eliminate such duplicates.
 - This was experimented with biometric data collection in Goa but was discontinued when Aadhaar was introduced.
- **Curbing Proxy Voting:** Aadhaar's authentication can prevent impersonation during voting.
- **Transparency in Electoral Rolls:** Ensures that one person has only one voter ID.
 - Helps identify errors or deliberate manipulation of rolls.

Why Linking Aadhaar with Voter ID Raises Concerns About Voting Rights

- **Risk of Genuine Voters Being Removed:** When Aadhaar is linked with voter IDs, mismatches or inaccuracies in the Aadhaar database can result in legitimate voters being wrongly removed from electoral rolls.
 - E.g., During the **2015 National Electoral Roll Purification and Authentication Programme**, around **55 lakh voters were dropped** in Telangana and Andhra Pradesh.
- **Threat to Privacy and Personal Autonomy:** Aadhaar contains sensitive biometric data, and linking it to voter IDs could raise concerns about unauthorized access or misuse.
- **Erosion of Voluntary Consent:** Although claimed to be optional, the process leaves voters with little choice.
 - E.g., **Form 6B** requires voters to either provide their Aadhaar number or declare they don't have one.
 - This coercive framing has resulted in the seeding of **over 66 crore Aadhaar numbers** by September 2023, often without informed consent.
- **Disproportionate Burden on Vulnerable Citizens:** The requirement for physical appearance to justify Aadhaar non-submission affects those already on the margins.
 - E.g., **Elderly, disabled, migrant workers**, and remote-area residents face difficulty attending in-person hearings before Electoral Officers—leading to potential disenfranchisement.
- **Lack of Procedural Safeguards:** There is no clear, accessible, or time-bound appeal process if a citizen's justification is rejected.
 - E.g., In **Lal Babu Hussein v. Electoral Registration Officer (1995)**, the Supreme Court emphasized that voter deletions must follow principles of **natural justice and procedural fairness**.
- **Constitutional and Legal Inconsistencies:** Aadhaar was never meant to verify citizenship.
 - E.g., Section 9 of the Aadhaar Act, 2016 explicitly states Aadhaar is not proof of citizenship.
 - Even **non-citizens** can obtain Aadhaar by residing in India for 182 days. The **UIDAI and multiple High Courts** have affirmed this.
- **Data Privacy and Surveillance Risks:** Linking Aadhaar opens the door to voter profiling and surveillance.

- E.g., The **Digital Personal Data Protection Act, 2023** allows broad exemptions for government entities.
 - With Aadhaar linkage, voter data can potentially be cross-referenced and **misused for political targeting or manipulation**.
- **Concerns Around Aadhaar Database Integrity:** The Aadhaar system itself suffers from significant errors.
 - E.g., The **2022 CAG report** highlighted that **4.75 lakh Aadhaar numbers were cancelled** due to duplication and biometric errors, calling into question the reliability of Aadhaar for electoral verification.

Suggested Path Forward

- **Strengthen Traditional Verification Practices:** Rather than depending solely on Aadhaar, the Election Commission can reinforce manual verification through local-level mechanisms.
 - E.g., In-person checks and door-to-door verification by Booth Level Officers (BLOs) are proven, inclusive methods to keep electoral rolls accurate without risking mass exclusions.
- **Ensure Transparency Through Independent Oversight:** Setting up **independent audits and social monitoring mechanisms** can help build public trust and prevent arbitrary deletions.
 - E.g., Establishing accessible grievance redressal forums and allowing civil society participation can act as a check against politically motivated manipulation of voter lists.

Conclusion

The Aadhaar-voter ID linkage, while projected as a cleanup exercise, carries serious implications for the health of Indian democracy. It risks excluding genuine voters, violates privacy principles, and undermines the independence of electoral processes. A citizen's right to vote must remain free from technological compulsion and rooted in constitutional protections—not in administrative convenience.

Source: [The Hindu: A move that endangers the right to vote](#)

India's potential in the Arctic region

Context

As Arctic ice melts due to climate change, new trade routes like the Northern Sea Route are emerging, prompting global powers, including India, to reassess geopolitical and economic opportunities.

Arctic Region



- Include the northern parts of Canada, the United States, Russia, Finland, Sweden, Norway, Iceland, and Greenland.

Impact of Climate Change in the Arctic

- **Melting Sea Ice:** September Arctic sea-ice is shrinking by **12.2% per decade** (NASA).
 - Indicates global warming and serves as a **canary in the coal mine** for climate catastrophe.
- **Emergence of New Trade Routes:**
 - Melting ice is opening the **Northern Sea Route (NSR)** — the shortest sea route between Europe and Asia.
 - Saves **time and freight cost**, potentially transforming global cargo flow.
- **Climate Feedback Loop:** Melting ice reduces the **Earth's albedo (reflectivity)**, accelerating warming.
 - Directly affects **monsoon patterns** and **agricultural outputs** in the Global South, including India.

Why the Arctic is Becoming Globally Important

- **Strategic Trade Routes:** The **NSR reduces maritime dependency on choke points** like the Malacca Strait and the Suez Canal.
 - Becoming a critical alternative amid geopolitical tensions.
- **Natural Resources:** Arctic is rich in **energy resources** (oil, gas, rare earths) and is increasingly accessible.
- **Geopolitical Leverage:** Arctic control provides **military and surveillance advantages** and expands economic spheres of influence.
- **Climate Diplomacy:** Arctic changes influence **global climate goals** (e.g., Paris Agreement).
 - Countries want a say in how the Arctic is governed.

Positions of Major Countries

Country	Position & Interests
Russia	<ul style="list-style-type: none"> ● Dominates the Arctic coastline. Building Arctic ports like Pevek and Sabetta. ● Controls much of the NSR. India-Russia working group on NSR established.
China	<ul style="list-style-type: none"> ● Promoting the Polar Silk Road, part of Belt Road Initiative (BRI). ● Wants Arctic access to bypass traditional routes like the Malacca Strait. ● Not an Arctic nation, but aggressively asserting interests.
United States	<ul style="list-style-type: none"> ● Strategic and military interest. ● Keen to limit Russia-China influence. ● Less infrastructural investment so far in Arctic trade routes.
European countries	<ul style="list-style-type: none"> ● Concerned about climate impact but interested in trade and environmental governance. ● Some Arctic Council members like Norway and Sweden are cautious of China-Russia moves.
Japan & South Korea	<ul style="list-style-type: none"> ● Wary of China-Russia alliance in the Arctic. ● Share India's concerns. ● Could become India's partners in sustainable and balanced Arctic engagement.

Opportunities for India

- **Strategic Trade Access:** NSR can boost India's maritime trade — **Chennai-Vladivostok Maritime Corridor** can link to NSR ports.
 - Cuts transport time to Europe and Russia.
- **Geopolitical Balancing:** India must balance relations with both the **West (U.S., Japan)** and **Russia**.
 - Can play a **neutral, bridge-building role** in Arctic diplomacy.
- **Arctic Research & Climate Impact:** India has a research base "**Himadri**" in Svalbard.
 - Indian studies have shown Arctic ice melt **alters monsoons** — vital for food security.
- **Shipbuilding & Infrastructure:** India's 2025-26 Budget allocates **\$3 billion Maritime Development Fund**.
 - Promoting **Arctic-grade shipbuilding** (icebreakers) through new clusters.
- **Multilateral Engagement:** **Arctic Circle India Forum (May 2025)** is a platform to promote India's Arctic vision.
 - India can advocate a **reformed, inclusive Arctic Council** and perhaps appoint a '**Polar Ambassador**'.

Source: [The Hindu: India's potential in the Arctic region](#)

India's Aviation Revolution

Context

India's aviation sector is among the fastest-growing sectors in the country's economy.

Fact

- India is the world's **3rd-largest** market in the aviation sector (1st- USA, 2nd- China).
- India boasts **13–18% of women pilots**.
- **2nd Asia-Pacific Ministerial Conference on Civil Aviation** was hosted in **New Delhi**.

Legislative Reforms Driving Systemic Transformation

- **Protection of Interest in Aircraft Objects Bill, 2025:** Aligns Indian laws with the **Cape Town Convention, 2001**.
 - Reduces **leasing costs** for Indian carriers (previously 8–10% higher).
 - Boosts **investor confidence** in Indian aviation.
 - Improves **contract enforceability** and **repossession certainty**.
 - Aims to foster **domestic aircraft leasing hubs**.
- **Bharatiya Vayuyan Adhiniyam, 2024:** Replaces the **colonial-era Aircraft Act of 1934**.
 - Supports **Make in India** and **Atmanirbhar Bharat** in aviation.
 - Aligns with **ICAO and Chicago Convention** norms.
 - Streamlines **licensing and regulatory processes**.
 - Introduces **appeal mechanisms** and removes outdated provisions.

Infrastructure Expansion: Building the Future of Indian Aviation

- **New Terminal Development:** Foundations laid in **Varanasi, Agra, Darbhanga, Bagdogra**.
- **Operationalised Greenfield Airports (12 out of 21):** Includes **Durgapur, Shirdi, Kannur, Mopa, Kushinagar, Shivamogga**, etc.
 - Progress underway at **Noida (Jewar)** and **Navi Mumbai**, targeted for **FY 2025–26**.
- **Ambitious Targets Ahead: 50 new airports** in the next **5 years**.
 - **120 new destinations** over **10 years**.
- **Capital Investment:** ₹91,000 crore earmarked under **National Infrastructure Pipeline (NIP)** (FY20–FY25).
 - ₹82,600 crore already spent by **Nov 2024**.

Other Key Government Initiative

- **National Civil Aviation Policy (NCAP) – 2016 (MoCA):** Enhances domestic aviation growth by rationalizing MRO taxation, supporting international expansion, and creating a more investor-friendly aviation ecosystem.
- **NABH (NextGen Airports for Bharat) Nirman (MoCA):** Focuses on modernizing airport infrastructure and increasing capacity to accommodate the rising number of air passengers.
- **DigiYatra (MoCA):** Introduces biometric-based, paperless travel to streamline airport processes and improve the passenger experience.
- **GAGAN (GPS-Aided GEO Augmented Navigation) – ISRO + AAI:** Enhances flight navigation accuracy and efficiency, improving operational safety through satellite-based augmentation.
- **100% FDI in Aviation (DPIIT):** Permits full foreign ownership in greenfield airport projects and up to 49% in domestic airlines via the automatic approval route to attract global investment.
- **Krishi Udan Scheme (MoCA):** Supports air transportation of perishable agricultural products, aiming to boost farmers' income and reduce post-harvest losses.
- **Aircraft Leasing & Financing at GIFT City (IFSCA):** Establishes a domestic hub for aircraft leasing and financing to reduce reliance on foreign leasing companies.

- **Open Sky Policy (MoCA):** Liberalizes international airspace access, encouraging greater global connectivity and foreign airline participation.
- **Make in India – Aviation (DPIIT):** Encourages domestic manufacturing of aircraft parts, systems, and airport infrastructure to strengthen the aviation supply chain and reduce imports.
- **GST Introduced:** A uniform **5% Integrated Goods and Services Tax (IGST)** rate has been introduced for aircraft parts to promote India as a competitive global MRO hub.

Union Budget 2025–26: Key Initiatives to Strengthen India’s Aviation Sector

- **Revamped UDAN Scheme:** The government has announced a modified UDAN initiative aimed at strengthening regional air connectivity.
 - The updated scheme will add 120 new destinations and is expected to serve an additional 4 crore passengers over the next 10 years.
- **Infrastructure Development:** Major plans include the expansion of Patna Airport and the development of a brownfield airport at Bihta in Bihar to enhance aviation infrastructure.
- **Focus on Remote Areas:** The UDAN scheme will also support the establishment of helipads and small airports in hilly regions, aspirational districts, and the Northeastern states, promoting access in underserved areas.
- **Budget Allocations:** The Ministry of Civil Aviation has been allotted ₹2,400.31 crore, a decrease from ₹2,658.68 crore in the previous year.
 - Funding for the **UDAN scheme** has been **reduced to ₹540 crore from ₹800 crore.**

About Regional Connectivity Scheme- Ude Desh ka Aam Naagrik (RCS-UDAN)

- **Launched:** 2016
- **Ministry:** Ministry of Civil Aviation
- **Objective:** To connect small and medium cities with big cities through air service.
- **Funding:** Jointly funded by the central government and state governments.
- **Features:** Linking **small and medium towns** to **major cities** through air connectivity.
 - Ensuring air travel is **affordable, economically sustainable, and commercially viable.**
 - Offering **financial incentives** to select airlines to promote services from **unserved and underserved airports.**

Two components of UDAN:

- **Airports:** The first component is to develop new airports and enhance the existing regional airports to increase the number of operational airports for scheduled civilian flights.
- **Flight routes:** The second component is to add several hundreds of new financially-viable, capped-airfare, new regional flight routes to connect more than 100 under-served and unserved airports in smaller towns by using "Viability Gap Funding" (VGF) where needed.

Significance of UDAN Scheme

- **Enhanced Regional Connectivity:** The scheme promotes **balanced regional development** by connecting smaller cities and remote areas with major urban hubs through air routes.
 - It boosts **intra-state and inter-state connectivity**, particularly in the North-Eastern states, hill states, and islands.
- **Affordable Air Travel:** UDAN caps airfare at **₹2,500 for a one-hour flight**, making flying more accessible to the common man.
 - This democratizes air travel, encouraging **middle-class and lower-middle-class** participation.
- **Infrastructure Development:** Development of **airports in tier-2 and tier-3 cities** fosters local infrastructure growth.
 - Reviving unused or underused airstrips helps in **optimizing national assets.**

- **Economic and Tourism Boost:** Enhanced connectivity promotes **tourism**, trade, and **employment generation**.
 - It leads to the **development of regional economies** and supports the **Make in India** and **Startup India** missions.
- **Environmental and Social Benefits:**
 - Better air connectivity reduces **road traffic congestion** and can **lower fuel usage** for long journeys.
 - Improves **medical evacuation** and emergency services access in remote areas.

What are the Concerns Associated With Aviation Sector

Operational Concerns

- **Grounded aircraft:** Over 160 aircraft (~25% of the fleet) remain non-operational due to financial stress and supply chain issues, reducing service capacity.
- **Crew shortages:** A 12-15% pilot deficit and lack of engineers/cabin staff lead to delays, cancellations, and safety risks (e.g., Vistara flight cancellations, Air India fines for unqualified crew).
- **Safety lapses:** Frequent technical failures, emergency landings, and runway incidents (e.g., **Kozhikode/Mangaluru crashes linked to pilot fatigue**).
- **Supply chain disruptions:** Delays in aircraft/engine deliveries from Boeing/Airbus exacerbate fleet shortages.

Financial Stress

- **Losses:** Airlines projected to lose \$1.6–1.8 billion in FY24, with net losses of ₹2,000–3,000 crore anticipated in FY25–26.
- **High costs:** Aviation Turbine Fuel (ATF) constitutes 45–50% of expenses, taxed at 40–50% (among the world's highest).
- **Debt burden:** Insolvencies of Jet Airways, Go First, and SpiceJet's precarious position reflect unsustainable debt levels.

Infrastructural Deficiencies

- **Airport congestion:** Major hubs like Delhi face capacity constraints, with each of India's 149 airports serving ~94 lakh people on average.
- **UDAN limitations:** Tier-2/3 cities remain underserved despite regional connectivity schemes.
- **Maintenance, Repair & Overhaul (MRO) gaps:** Reliance on foreign maintenance facilities increases costs.
- **Structural risks:** Incidents like Delhi airport's roof collapse highlight rushed infrastructure development.

Environmental Pressures

- **Carbon emissions:** Compliance with CORSIA mandates costly sustainable aviation fuel (SAF) adoption.
- **Sustainability gaps:** Limited investment in green airports and carbon-neutral technologies.

Additional Risks

- **Global factors:** Oil price volatility and geopolitical tensions strain profitability.
- **Skill mismatches:** Training programs fail to address real-world operational challenges (e.g., unstable approaches)

Way Forward

- **Infrastructure Modernization & Expansion:** Accelerate the 200-airport target by 2025 and 4,000-aircraft fleet plan through \$11 billion in infrastructure investments.

- **Prioritize greenfield airports in underserved regions and upgrade existing hubs** (e.g., Delhi, Mumbai) to handle rising traffic, which is projected to double by 2029.
- **Legislative & Policy Reforms:** Implement the Protection of Interest in Aircraft Objects Bill, 2025 to align leasing laws with global standards.
- **MRO Ecosystem Development:** Establish MRO clusters near major airports and streamline customs for faster spare-part clearances.
- **Workforce & Safety Enhancements:** Address 12–15% crew shortages through accelerated training programs and partnerships with global institutes.
 - Mandate AI-driven safety protocols and fatigue management systems to reduce incidents like unstable approaches and runway overruns.
- **Sustainable Aviation Initiatives:** Scale sustainable aviation fuel (SAF) production to meet CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation) 2050 targets, supported by subsidies and R&D investments.
 - Convert airports to net-zero carbon operations via solar energy and energy-efficient designs (e.g., Delhi's T3 solar plant).
- **Technological Integration & Global Collaboration:** Adopt AI/ML for predictive maintenance and digital twin systems to optimize operations.
 - Partner with firms like Airbus for "Make in India" aviation manufacturing, starting with the TATA-Airbus C-295 facility in Vadodara.
 - Expand UDAN 5.0 to enhance last-mile connectivity through electric/hybrid aircraft pilots.

Source: [PIB: India's Aviation Revolution](#)

