



Daily PIB Summary

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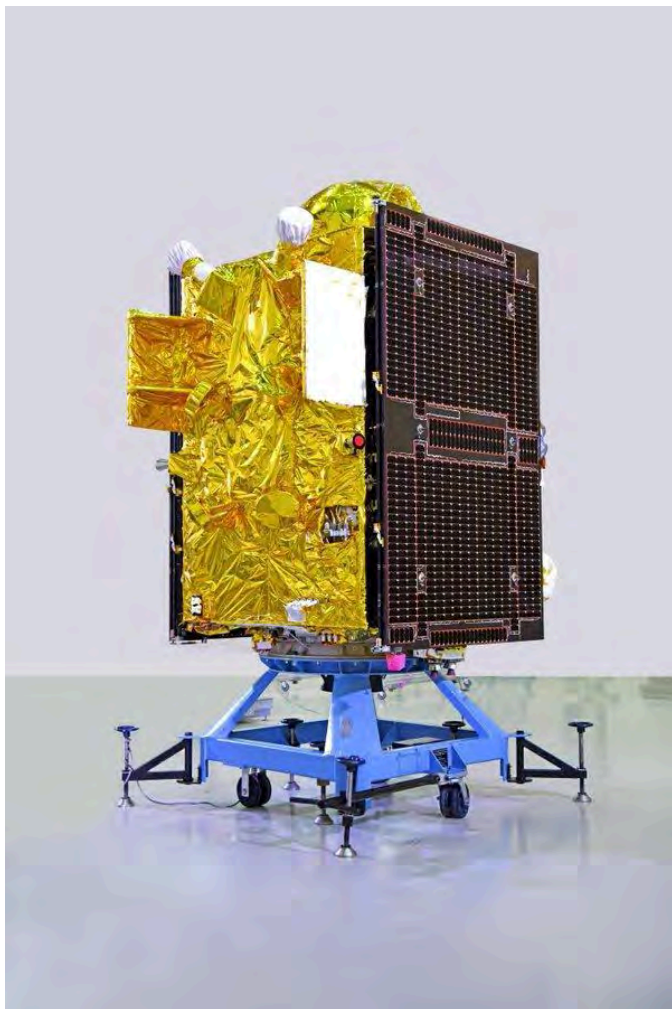
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1. GAGAN: NAVIGATING INDIA'S SKIES WITH PRECISION



- GAGAN is India's **Satellite-Based Augmentation System (SBAS)** developed to improve the accuracy, integrity, and reliability of Global Navigation Satellite Systems (GNSS).
- The system enhances aircraft navigation, especially during approach and landing, thereby improving aviation safety.
- GAGAN supports efficient air traffic management by enabling optimized flight routes, reducing fuel consumption, and lowering emissions.
- It reduces dependence on foreign augmentation systems and strengthens India's strategic capabilities in navigation services.
- The system has applications beyond civil aviation, including disaster management,

surveying, agriculture, maritime navigation, and geospatial services.

- GAGAN represents successful collaboration between ISRO and the Airports Authority of India (AAI).
- The initiative contributes to modernizing India's aviation infrastructure and promoting self-reliance in space-based technologies.
- It strengthens India's position among the few countries possessing an operational SBAS.

BACKGROUND / CONTEXT

What is GAGAN?

- **GAGAN** stands for **GPS Aided GEO Augmented Navigation**.
- It is India's **Satellite-Based Augmentation System (SBAS)**.
- Developed jointly by the **Indian Space Research Organisation (ISRO)** and the **Airports Authority of India (AAI)**.
- Certified for aviation use to improve navigation precision.

How GAGAN Works

- Receives signals from Global Navigation Satellite Systems (GNSS).
- Uses a network of ground reference stations to detect signal errors.
- Generates correction messages.
- Broadcasts corrected signals through geostationary satellites.

Applications

- Civil aviation.
- Air traffic management.
- Precision aircraft landing.
- Maritime navigation.
- Surveying and mapping.
- Disaster management.
- Precision agriculture.

Satellite-Based Augmentation System (SBAS)

- I. Improves the **accuracy, integrity, availability, and continuity** of satellite navigation signals.
- II. Similar systems include:
 - A. **WAAS** (USA)
 - B. **EGNOS** (Europe)

C. MSAS (Japan)

KEY HIGHLIGHTS

- **Full Form:** GPS Aided GEO Augmented Navigation (GAGAN).
- **Developed By:** ISRO and Airports Authority of India (AAI).
- **Technology:** Satellite-Based Augmentation System (SBAS).
- **Primary Objective:** Improve navigation accuracy and aviation safety.
- **Strategic Significance:** Enhances India's self-reliance in satellite navigation infrastructure.
- **Applications:** Aviation, maritime navigation, disaster management, surveying, and agriculture.
- **Environmental Impact:** Optimized flight paths reduce fuel consumption and carbon emissions.
- **Way Forward:** Expand GAGAN applications across sectors, strengthen satellite infrastructure, and integrate with emerging navigation technologies.

PRELIMS BOOSTER BOX

- **GAGAN:** GPS Aided GEO Augmented Navigation.
- **Type:** Satellite-Based Augmentation System (SBAS).
- **Developed By:** ISRO and Airports Authority of India (AAI).
- **GNSS:** Global Navigation Satellite System.
- **SBAS Functions:** Improves accuracy, integrity, availability, and continuity of navigation signals.
- **Geostationary Satellite:** Satellite orbiting at approximately **35,786 km** above the equator with the same rotational period as Earth.
- **WAAS:** Wide Area Augmentation System (USA).
- **EGNOS:** European Geostationary Navigation Overlay Service (Europe).
- **MSAS:** Multi-functional Satellite Augmentation System (Japan).
- **Difference:** **GAGAN** is an augmentation system, whereas **NavIC** is India's independent regional satellite navigation system.

PadhAI-GENERATED UPSC MCQ

Consider the following statements:

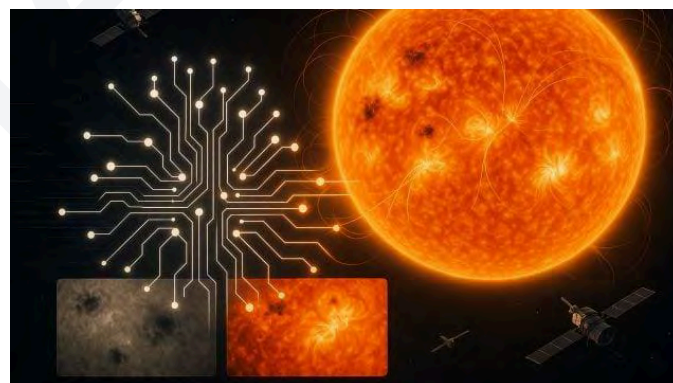
1. GAGAN is India's Satellite-Based Augmentation System developed jointly by ISRO and the Airports Authority of India.
2. GAGAN enhances the accuracy and integrity of Global Navigation Satellite System (GNSS) signals.
3. NavIC and GAGAN are identical systems performing the same function.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 1 and 2 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

Answer: (b)

2. AI STUDIES 100 YEARS OF SUN IMAGES TO TRACK BRIGHT SOLAR REGIONS FROM THE KODAIKANAL SOLAR OBSERVATORY



- AI techniques have been employed to analyse century-long archival solar observations from the Kodaikanal Solar Observatory.
- The study tracks **solar plagues**, which are bright regions associated with strong magnetic activity on the Sun.
- Long-term analysis helps scientists understand solar cycles and variations in solar magnetic activity.
- Improved monitoring of solar activity contributes to better forecasting of space weather events that can affect satellites, communication systems, and power grids.



- The research showcases the importance of digitising historical scientific records for modern data-driven analysis.
- AI significantly accelerates image processing and enhances the accuracy of identifying solar features.
- The findings strengthen India's contribution to solar physics and observational astronomy.
- The study highlights the growing integration of AI with space science and astrophysical research.

BACKGROUND / CONTEXT

Kodaikanal Solar Observatory (KSO)

- Established in **1899** at **Kodaikanal**.
- Operated by the **Indian Institute of Astrophysics**.
- One of the world's oldest continuously operating solar observatories.
- Maintains an extensive archive of solar observations spanning more than a century.

Solar Plages

- Bright regions observed in the Sun's **chromosphere**.
- Associated with intense magnetic fields and active regions.
- Often occur near sunspots and indicate enhanced solar activity.

Solar Cycle

- The Sun undergoes an approximately **11-year solar cycle**.
- Characterized by periodic changes in sunspot numbers and magnetic activity.
- Influences space weather and solar radiation reaching Earth.

Space Weather

- I. Refers to conditions in space influenced by solar activity.
- II. Can affect:
 - A. Satellites.
 - B. GPS and navigation systems.
 - C. Radio communications.
 - D. Power transmission networks.
 - E. Astronaut safety.

KEY HIGHLIGHTS

- **Research:** AI-based analysis of over 100 years of solar observations.
- **Institution:** Kodaikanal Solar Observatory under the Indian Institute of Astrophysics.
- **Focus:** Tracking solar plages to study long-term solar magnetic activity.
- **Technology:** Artificial Intelligence for automated image analysis.
- **Scientific Significance:** Improves understanding of solar cycles and space weather.
- **Strategic Importance:** Supports satellite operations, communication systems, and space missions.
- **Challenges:** Processing historical datasets, ensuring data consistency, and improving predictive accuracy.
- **Way Forward:** Expand AI applications in astronomy, digitise archival observations, and strengthen space weather forecasting capabilities.

PRELIMS BOOSTER BOX

- **Kodaikanal Solar Observatory (KSO):** Established in **1899** in Tamil Nadu.
- **Managing Institution:** Indian Institute of Astrophysics (IIA).
- **Solar Plages:** Bright chromospheric regions associated with strong magnetic fields.
- **Sunspots:** Dark, cooler regions on the Sun caused by intense magnetic activity.
- **Solar Cycle:** Approximately **11 years**.
- **Chromosphere:** Layer of the Sun's atmosphere above the photosphere.
- **Photosphere:** Visible surface of the Sun.
- **Space Weather:** Conditions caused by solar activity affecting Earth's space environment.
- **Coronal Mass Ejection (CME):** Large eruption of plasma and magnetic fields from the Sun.
- **Artificial Intelligence (AI):** Enables automated analysis of large scientific datasets and pattern recognition.

PadhAI-GENERATED UPSC MCQ

Consider the following statements:



1. Solar plages are bright regions in the Sun's chromosphere associated with strong magnetic activity.
2. The Kodaikanal Solar Observatory is operated by the Indian Institute of Astrophysics.
3. Space weather has no impact on satellite communication or power transmission systems.

Which of the statements given above is/are correct?

- (a) 1 only
(b) 1 and 2 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (b)

3. INDIA, EU ADVANCE COOPERATION ON SUSTAINABLE SHIP RECYCLING; THREE INDIAN YARDS READY FOR EU RECOGNITION



- India and the European Union are enhancing collaboration to promote environmentally sustainable and safe ship recycling practices.
- Recognition of Indian recycling yards under EU standards will improve their access to the international ship recycling market.
- The initiative reflects India's progress in adopting global environmental, labour, and safety standards in the maritime sector.
- Sustainable ship recycling supports resource efficiency through the recovery and reuse of steel and other valuable materials.

- The development is expected to enhance India's competitiveness in the global circular economy.
- Compliance with international standards improves worker safety, environmental protection, and responsible waste management.
- The cooperation also strengthens India-EU maritime and economic relations.
- It aligns with India's commitment to sustainable industrial development and green shipping practices.

BACKGROUND / CONTEXT

Ship Recycling in India

- India is one of the world's leading ship recycling nations.
- The **Alang Ship Breaking Yard** in Gujarat is among the world's largest ship recycling facilities.
- Ship recycling recovers steel, machinery, and reusable equipment while ensuring environmentally sound disposal of hazardous materials.

Hong Kong International Convention (HKC)

- Adopted under the **International Maritime Organization** in 2009.
- Seeks to ensure safe and environmentally sound recycling of ships.
- Covers the entire lifecycle of ships, from design to recycling.

EU Ship Recycling Regulation

- Regulates recycling of EU-flagged ships.
- Requires recycling only in facilities included in the **European List of Ship Recycling Facilities**.
- Emphasizes worker safety, environmental protection, and proper management of hazardous materials.

Circular Economy

- Promotes efficient use, reuse, repair, recycling, and recovery of resources.
- Reduces waste generation and dependence on virgin raw materials.

KEY HIGHLIGHTS

- **Cooperation:** India-EU partnership on sustainable ship recycling.



- **Recognition:** Three Indian ship recycling yards ready for EU recognition.
- **Environmental Significance:** Promotes environmentally sound recycling and pollution control.
- **Economic Impact:** Enhances India's competitiveness in the global ship recycling industry.
- **Resource Efficiency:** Encourages recycling and supports the circular economy.
- **Worker Safety:** Strengthens occupational health and safety standards.
- **Challenges:** Hazardous waste management, environmental compliance, and continuous infrastructure upgradation.
- **Way Forward:** Expand internationally compliant recycling facilities, strengthen environmental monitoring, implement Hong Kong Convention standards, and promote green maritime practices.

PRELIMS BOOSTER BOX

- **Major Ship Recycling Hub:** Alang Ship Breaking Yard.
- **State:** Gujarat.
- **Hong Kong International Convention (HKC):** Adopted in **2009** under the International Maritime Organization (IMO).
- **Objective of HKC:** Safe and environmentally sound recycling of ships.
- **International Maritime Organization (IMO):** Specialized agency of the United Nations responsible for maritime safety, security, and prevention of marine pollution.
- **EU Ship Recycling Regulation:** Governs recycling of EU-flagged ships in approved facilities.
- **Circular Economy:** Economic model based on reuse, repair, refurbishment, and recycling of resources.
- **Hazardous Materials in Ships:** Asbestos, PCBs, heavy metals, and residual oils.
- **Green Recycling:** Recycling practices minimizing environmental damage and ensuring worker safety.
- **Blue Economy:** Sustainable use of ocean resources for economic growth while conserving marine ecosystems.

PadhAI-GENERATED UPSC MCQ

Consider the following statements:

1. The Hong Kong International Convention was adopted under the International Maritime Organization (IMO).
2. Alang Ship Breaking Yard is located in Gujarat.
3. The Circular Economy encourages efficient resource use through reuse, repair, and recycling.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 1 and 2 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

Answer: (d)

4. AIR MARSHAL TEJINDER SINGH TAKES OVER AS CISC



- Air Marshal Tejinder Singh has taken over as the Chief of Integrated Defence Staff (CISC), a crucial position in India's defence establishment.
- The CISC assists the Chairman, Chiefs of Staff Committee (COSC) and supports integrated planning, joint operations, and capability development.
- The appointment comes as India continues to enhance tri-service integration and modernize its armed forces.
- The Headquarters Integrated Defence Staff (HQ IDS) plays a vital role in defence planning, training, logistics, and interoperability among the Army, Navy, and Air Force.



- Strengthening jointness is essential for addressing emerging challenges in multi-domain warfare.
- The appointment supports ongoing defence reforms aimed at improving operational efficiency and resource optimization.
- It also contributes to the development of integrated theatre commands and future-ready military capabilities.
- The transition reinforces India's commitment to building a technologically advanced and integrated defence structure.

BACKGROUND / CONTEXT

Chief of Integrated Defence Staff (CISC)

- I. The **Chief of Integrated Defence Staff (CISC)** heads the **Headquarters Integrated Defence Staff (HQ IDS)**.
- II. Functions as the principal staff officer responsible for integrated planning and coordination among the three Services.
- III. Assists in:
 - A. Joint operational planning.
 - B. Force modernization.
 - C. Capability development.
 - D. Training and logistics.
 - E. Defence policy implementation.

Headquarters Integrated Defence Staff (HQ IDS)

- Established in **2001** following the recommendations of the **Kargil Review Committee**.
- Promotes integration among the Army, Navy, and Air Force.
- Supports long-term defence planning and joint operations.

Higher Defence Management

- **President of India** is the Supreme Commander of the Armed Forces.
- **Chief of Defence Staff (CDS)** promotes jointness and integration among the three Services.
- **Department of Military Affairs (DMA)** was established in **2019** under the Ministry of Defence.

Integrated Theatre Commands

- Proposed unified military commands integrating resources of the Army, Navy, and Air Force.
- Aim to improve operational efficiency, interoperability, and rapid response.

KEY HIGHLIGHTS

- **Appointment:** Air Marshal Tejinder Singh assumes charge as CISC.
- **Organization:** Headquarters Integrated Defence Staff (HQ IDS).
- **Primary Role:** Promote integrated planning and coordination among the three Services.
- **Strategic Importance:** Strengthens joint military operations and higher defence management.
- **Defence Reforms:** Supports modernization and integrated theatre command initiatives.
- **Operational Impact:** Enhances interoperability, logistics, and capability development.
- **Challenges:** Multi-domain threats, technological advancements, and effective tri-service integration.
- **Way Forward:** Accelerate theatre command reforms, strengthen indigenous defence technologies, enhance joint training, and improve inter-service coordination.

PRELIMS BOOSTER BOX

- **CISC:** Chief of Integrated Defence Staff.
- **HQ IDS:** Headquarters Integrated Defence Staff.
- **HQ IDS Established: 2001.**
- **Basis:** Recommendation of the **Kargil Review Committee**.
- **Chief of Defence Staff (CDS):** Created in **2019** to promote jointness among the Armed Forces.
- **Department of Military Affairs (DMA):** Established under the Ministry of Defence in **2019**.
- **Supreme Commander of the Armed Forces:** President of India.
- **Integrated Theatre Command:** Unified command integrating Army, Navy, and Air Force resources.
- **Interoperability:** Ability of different military services to operate effectively together.

- **Multi-Domain Operations:** Integrated operations across land, air, sea, cyber, and space domains.

PadhAI-GENERATED UPSC MCQ

Consider the following statements:

1. Headquarters Integrated Defence Staff (HQ IDS) was established in 2001 following the recommendations of the Kargil Review Committee.
2. The Chief of Integrated Defence Staff (CISC) plays a key role in promoting jointness among the Army, Navy, and Air Force.
3. The President of India is the operational commander of the Indian Armed Forces.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 1 and 2 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

Answer: (b)

5. CCI APPROVES ACQUISITION OF CERTAIN SHAREHOLDING IN NIPPON LIFE INDIA AIF MANAGEMENT LIMITED BY DWS GROUP GMBH & CO. KGAA



- CCI's approval enables the proposed acquisition after assessing its impact on competition in the relevant market.
- Merger control by CCI seeks to ensure that combinations do not cause an appreciable adverse effect on competition.
- The transaction reflects continued foreign investment interest in India's financial services

and alternative investment management sector.

- Effective competition regulation promotes market efficiency, consumer welfare, and fair business practices.
- Foreign participation can enhance capital availability, innovation, and expertise in financial markets.
- CCI approvals provide regulatory certainty while maintaining competitive market structures.
- The development highlights the importance of transparent competition regulation in attracting investment.
- A robust competition framework supports sustainable economic growth and efficient capital allocation.

BACKGROUND / CONTEXT

Competition Commission of India (CCI)

- I. Statutory body established under the **Competition Act, 2002**.
- II. Became operational in **2009**.
- III. Responsible for:
 - A. Preventing anti-competitive practices.
 - B. Promoting and sustaining competition.
 - C. Protecting consumer interests.
 - D. Regulating combinations (mergers, acquisitions, and amalgamations).

Combination under the Competition Act

- I. Refers to:
 - A. Mergers.
 - B. Acquisitions.
 - C. Amalgamations.
- II. Certain combinations meeting prescribed thresholds require prior approval from CCI.

Alternative Investment Fund (AIF)

- Privately pooled investment vehicle regulated by the **Securities and Exchange Board of India (SEBI)**.
- Invests in accordance with a defined investment policy for the benefit of investors.

Categories of AIFs

- **Category I:** Venture Capital Funds, Infrastructure Funds, Social Venture Funds, etc.



- **Category II:** Private Equity Funds, Debt Funds, etc.
- **Category III:** Hedge Funds and other funds employing complex trading strategies.

KEY HIGHLIGHTS

- **Regulatory Approval:** CCI approved the proposed acquisition.
- **Transaction:** DWS Group to acquire certain shareholding in Nippon Life India AIF Management Limited.
- **Legal Framework:** Competition Act, 2002.
- **Sector:** Alternative Investment Fund (AIF) management.
- **Economic Significance:** Encourages investment while preserving market competition.
- **Governance Impact:** Strengthens transparent and rules-based competition regulation.
- **Challenges:** Market concentration, regulatory compliance, and maintaining competitive neutrality.
- **Way Forward:** Continue strengthening competition law enforcement, facilitate responsible investments, and promote efficient financial markets.

PRELIMS BOOSTER BOX

- **CCI:** Competition Commission of India.
- **Parent Law:** Competition Act, 2002.
- **Operational Since:** 2009.
- **Objective:** Prevent practices having an appreciable adverse effect on competition.
- **Combination:** Merger, acquisition, or amalgamation requiring regulatory scrutiny.
- **AIF:** Alternative Investment Fund.
- **Regulator of AIFs:** Securities and Exchange Board of India.
- **Category I AIF:** Venture capital, infrastructure, and social venture funds.
- **Category II AIF:** Private equity and debt funds.
- **Category III AIF:** Hedge funds and similar investment vehicles using complex strategies.

PadhAI-GENERATED UPSC MCQ

Consider the following statements:

1. The Competition Commission of India was established under the Competition Act, 2002.

2. Alternative Investment Funds (AIFs) in India are regulated by the Securities and Exchange Board of India (SEBI).
3. Every merger or acquisition in India requires mandatory approval from the Competition Commission of India, irrespective of its size.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 1 and 2 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

Answer: (b)