

Today's Prelims Topics

TrailGuard AI

Context

Similipal Tiger Reserve in Odisha has implemented an AI-powered anti-poaching surveillance system called **TrailGuard AI**.

About TrailGuard AI

- It is an **AI-powered surveillance system** designed to combat poaching and illegal wildlife trade by providing real-time monitoring in protected forests.
- It is designed by **Nightjar Technologies**.
- It is currently deployed in 5 states across 14 locations, including Kanha Tiger Reserve (Madhya Pradesh) and Dudhwa National Park (Uttar Pradesh).
- **Key Features of TrailGuard AI:**
 - **Compact and Durable Design:** Unique two-part design:
 - Camera unit (size of a pen) & Battery/communication unit (size of a notepad).
 - This spread-out design makes it less noticeable and harder to steal.
 - **Long Battery Life:** Operates for 6 months to 1 year without needing a battery replacement.
 - **Affordable Cost:** Costs ₹50,000-₹53,000 per unit, making it cheaper than other live transmission technologies.



Working Mechanism of TrailGuard

- **Motion Detection:** AI-powered cameras stay in low-power mode and activate upon detecting movement.
- **Object Recognition:** An integrated AI chip processes the image and classifies it as an 'animal,' 'human,' or 'vehicle.'
- **Real-Time Alerts:** If a potential threat is identified, the camera transmits the image to a control room within 40 seconds.
- **Swift Communication:** Officials quickly relay information through WhatsApp and Very High Frequency (VHF) radio to deploy forest rangers.
- **Poacher Identification & Action:** Intelligence teams analyze images, confirm identities, conduct house raids and proceed with legal action.

Source:

- [The Hindu - AI fit cameras](#)

Discovery of Ovoid Cells and Their Role in Memory

Context

Researchers have identified a new type of neuron responsible for recognition memory, the brain's ability to distinguish between new and familiar objects and form long-term memories.

About Ovoid Cells

- Ovoid cells are named for their **distinct egg-like shape**.
- They exist in **relatively small numbers** in the **hippocampus** of various mammals, including humans and mice.
- **Ovoid cells become active** when an individual encounters an unfamiliar object. This activation initiates the process of encoding and storing the object's details in memory, enabling recognition even after an extended period.
 - **Object recognition memory** is essential for daily functioning and survival, influencing behavior and decision-making.
- These neurons exhibit unique gene expression profiles and neural circuitry, setting them apart from other hippocampal neurons.

Significance of Study

- The discovery offers new insights into memory formation and could help treat brain disorders affecting object recognition, such as:
 - Alzheimer's disease.
 - Autism Spectrum Disorder (ASD).
 - Epilepsy.

Source:

- [DD News - Ovoid Cells](#)

SC Directives in Remission

Context

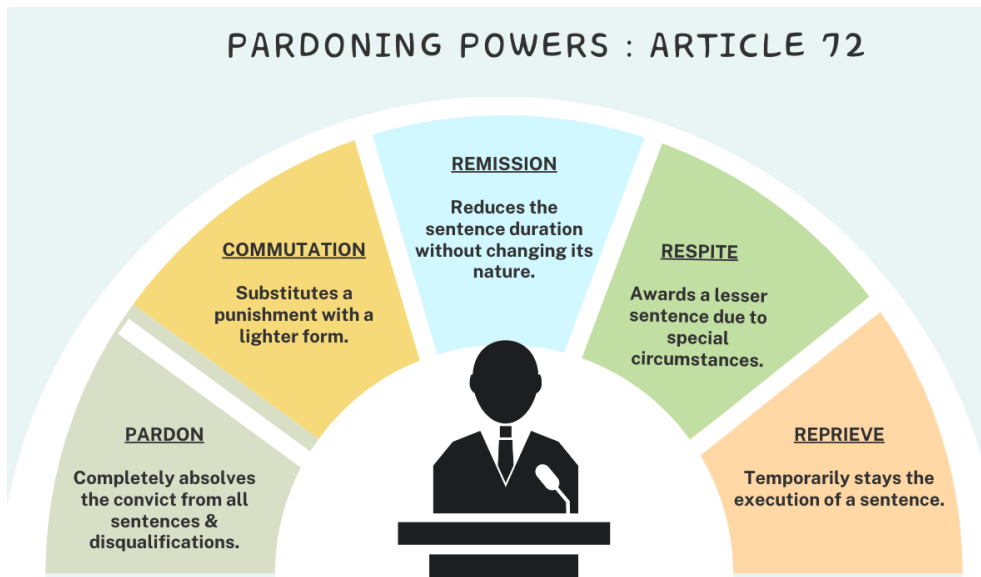
Recently the Supreme Court has ruled that **appropriate governments must proactively consider the premature release of eligible convicts** under remission policies.

Key Directives from the Supreme Court Judgment

- **Mandatory Consideration of Premature Release:**
 - If the government has a policy under **Section 432 of the CrPC** or **Section 473 of the BNSS 2023**, it **must consider all eligible convicts** for premature release.
 - **Section 432 CrPC:** It empowers the appropriate government (State or Union) to suspend or remit a sentence of a convict, either wholly or partially. (Section 473 of BNSS has replaced it).
 - Authorities **cannot wait for convicts or their relatives to apply**; they must act automatically when eligibility conditions are met.
 - **If a state government insists on applications, it would be discriminatory and violate Article 14 of the Constitution** (Right to Equality).
- **Obligation to Formulate a Remission Policy:**
 - **States and Union Territories without a remission policy** under Sections **432 (CrPC) or 473 (BNSS)** must **formulate one within two months** from the ruling.
- **Transparent Decision-Making & Communication:**
 - Orders granting or rejecting remission must have clear reasons and be communicated to the convict through the prison office.
 - Prison authorities must inform convicts of their right to challenge rejections.
- **Conditions for Remission:** Must be reasonable, specific, & feasible, considering nature of crime & public safety.

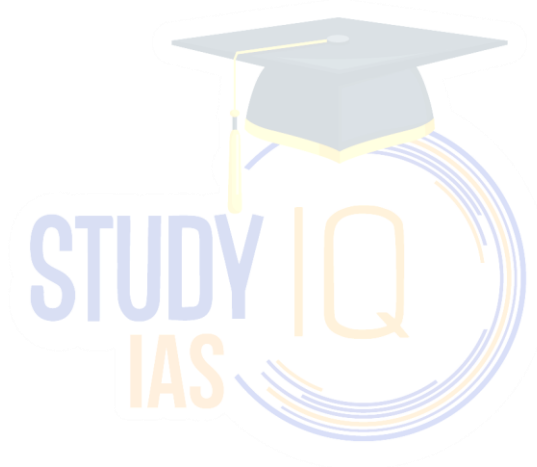
Related Supreme Court Judgements

- **Mafabhai Motibhai Sagar v. State of Gujarat (2024):** The Supreme Court ruled that an order granting permanent remission cannot be withdrawn or canceled without first providing the convict an opportunity to be heard.
- **State of Haryana v. Mahender Singh & Ors. (2007):** The Supreme Court held that while convicts do not possess a fundamental right to remission, they are legally entitled to have their cases considered for such relief.



Source:

- [Indian Express - Remission directives by SC](#)



Earthquake Swarm

Context

A state of emergency has been declared on **Greece's Santorini** and the nearby islands of Ios, Amorgos, and Anafi after a swarm of undersea earthquakes.

What is an Earthquake Swarm?

- An **earthquake swarm** refers to a sequence of multiple seismic events of **comparable intensity** that occur in a **small geographic area** over a **short period of time**.
- Unlike earthquake sequences, **swarms lack a single large mainshock**, and the tremors **continue intermittently**.
- Swarms are usually short-lived, but they can continue for days, weeks, or sometimes even months.

Earthquake Swarms in India

- **Peninsular India** has experienced earthquake swarms in the past.
- **Cause: Water Seepage and Pressure Buildup**
 - Heavy rainfall **increases the water table**, leading to **water seeping into underground rock fractures**.
 - A **2008 study** found that for **every 10-meter rise** in the **water table**, the **pressure inside rocks increases by 1 atmosphere (atm)**.
 - This pressure buildup is released in the form of **earthquake swarms**.

Source:

- [The Hindu - Can't stop shaking](#)

Humpback Whale Accidentally Engulfs Kayaker in Chile

Context

Recently a 23-year-old Venezuelan kayaker was briefly engulfed by a humpback whale while kayaking through the **Strait of Magellan, (off Chile's Patagonian coast)**.

Types of Whales

- **Baleen Whales (Mysticeti) – 14 species**
 - **E.g:** Blue whales, humpback whales, grey whales.
 - **Feeding mechanism:** Have baleen plates instead of teeth, used for filter-feeding small prey like krill and fish.
 - **Throat size:** Extremely small (size of a human fist), making it impossible to swallow a human.



- **Toothed Whales (Odontoceti) – Over 70 species**

- **E.g:** Sperm whales, beaked whales, killer whales, dolphins.
- **Feeding mechanism:** Have teeth and hunt larger prey like fish and squid.
- **Throat size:** Larger than baleen whales, but still cannot swallow a human.
- **Exception:** Sperm whales have large enough throats to swallow a human. However, such encounters are extremely rare (described as a "billion to one" chance by National Geographic).



Why Did the Whale Engulf the Kayaker?

- According to experts from Marine Conservation, humpback whales often charge to the surface with open mouths to capture prey.
- It is likely the whale did not detect the kayak due to cloudy conditions and the kayak's minimal noise.
- Humpbacks primarily rely on hearing, and small, motorless vessels like kayaks produce little sound, contributing to the accidental encounter.

Source:

- [Indian Express - Gulpd by a Whale](#)

News in Shorts

Exercise Dharma Guardian

- The **sixth edition of Joint Military Exercise Dharma Guardian** is scheduled at Mount Fuji, Japan from February 25 to March 9.

About Dharma Guardian

- It is a joint military exercise between **India and Japan**.
- It is conducted annually in India and Japan on an alternated basis.
- The exercise aims to enhance interoperability between the two forces while undertaking joint urban warfare and counter-terrorism operations under UN mandate.
- **Other Exercises between India & Japan: Veer Guardian (Air Exercise), JIMEX (Maritime).**

Source:

- [DD News - India, Japan joint military exercise](#)

India's First Biannual Transparency Report

- India is in the **final stages** of preparing its **first-ever Biannual Transparency Report (BTR)**.
- This is part of India's commitment under the **2015 Paris Agreement** on climate change.

About Biannual Transparency Report

- **BTR is an official document** that provides details on:
 - India's greenhouse gas emissions inventory (sectors and sources of emissions).
 - Efforts to improve energy efficiency and shift to renewable energy sources.
 - Availability of resources for climate action.
- Unlike previous submissions like **National Communications** and **Biannual Update Reports (BURs)**, the BTR will be subject to technical review by **UNFCCC-accredited international experts**.
- This will ensure greater **accountability and transparency**.
- **Comparison with Previous Reports:** The last BUR (submitted earlier) contained **data up to 2020**. The upcoming BTR will present **more recent and updated figures** on India's emissions and climate action efforts.

Global Context and Compliance

- Historically, **only developed countries** were required to submit **BTRs**.
- However, under the **Paris Agreement**, **all signatories** agreed to submit BTRs to increase transparency.
- **Deadline:** All countries were expected to submit BTRs by **December 2024**, but several—including India—**missed this deadline**.

Source:

- [The Hindu - BTR](#)

U.S.-Russia Talks on Ukraine War and Diplomatic Relations

- The **U.S. and Russia agreed** to work towards ending the war in Ukraine and improving their diplomatic and economic ties.'
- The meeting, held in **Riyadh**, was attended by **U.S. Secretary of State Marco Rubio** and **Russian Foreign Minister Sergey Lavrov**.

Main Agreements Reached

- **Restoration of Diplomatic Staffing:**
 - Both nations agreed to work towards **restoring diplomatic staffing** at their respective embassies in **Washington and Moscow**.
- **Creation of a High-Level Team for Ukraine Peace Talks:**
 - Representatives will be appointed to **hold regular consultations on Ukraine** and work towards **an enduring and sustainable peace settlement**.
- **Exploring Economic and Geopolitical Cooperation:**
 - Both sides will look into **future cooperation on geopolitical issues and economic investment opportunities**.

Source:

- [The Hindu - US Russia agree to end war in Ukraine](#)

NAKSHA Programme

- NAKSHA stands for **National Geospatial Knowledge-based Land Survey of Urban Habitations**.
- It aims to **create and update land records** in **urban areas** to ensure accurate and reliable documentation of land ownership.

Objectives of NAKSHA

- **Accurate and reliable land records:** Updating land records in urban and semi-urban areas.
- **Empowering citizens:** Reducing land disputes and improving ease of property transactions.
- **Enhancing urban planning:** Supporting infrastructure projects and smart city initiatives.
- **Ensuring transparency & efficiency:** IT-based system for property record administration.
- **Sustainable development:** Facilitating orderly urban growth and minimizing conflicts over land ownership.

Source:

- [PIB - Pilot project NAKSHA](#)

Detailed Coverage

India-Qatar Relations

Context

India and Qatar elevated their bilateral ties to a strategic partnership, during the state visit of Amir of Qatar.

Timeline of India-Qatar Relations

- **1973 – Establishment of Diplomatic Relations**
 - Formal diplomatic ties established.
 - Indian Embassy opened in Doha & Qatari Embassy in New Delhi.
- **1981 – Emir of Qatar’s First Official Visit to India**
 - Strengthening bilateral trade and political relations.
- **1999 – Agreement on Defence Cooperation**
 - First formal defense agreement between India and Qatar.
- **2012 – LNG Supply Agreement Signed**
 - Qatar signs a 25-year LNG supply deal with India (7.5 million metric tonnes per annum).
 - Qatar becomes India’s largest LNG supplier.
- **2015 – PM Modi’s Visit to Qatar**
 - Strengthening of economic ties and investments.
 - Major focus on counterterrorism and security partnership.
- **2023 – Release of Indian Navy Veterans**
 - Diplomatic efforts lead to release of seven out of eight detained ex-Navy officers.
- **2024 – Elevation to a ‘Strategic Partnership’**
 - PM Modi and Emir Sheikh Tamim bin Hamad Al Thani upgrade relations to Strategic Partnership.
 - Focus on trade, investment, energy and security cooperation.

Areas of Cooperation Between India and Qatar & Key Developments

- **Trade & Economic Cooperation:**
 - **Bilateral Trade Growth:** Current Trade Volume (2024): USD 14 billion.
 - **Target (2030): USD 28 billion** (doubling in 5 years).
 - **Major Exports from India:** Machinery, food products, automobiles, electronics.
 - **Major Imports from Qatar:** Liquefied Natural Gas (LNG), petrochemicals, fertilizers, plastics.
 - **Foreign Direct Investment (FDI):**
 - **Qatar Investment Authority (QIA):** It has invested **USD 1.5 billion** in India in sectors such as Retail, power, IT, education, health, affordable housing.
 - **New Investment Commitment: USD 10 billion** (announced in Feb 2025) in **infrastructure, ports, ship-building, smart cities, renewable energy, AI and robotics.**

- **Free Trade Agreement (FTA) Discussions:**
 - **Currently** India-GCC FTA Negotiations are in progress, also India-Qatar FTA is also being explored.
 - **Expected Benefits:** Tariff reduction, increased market access, improved investment climate.
- **Energy Cooperation:**
 - **Natural Gas Supply:** Qatar supplies over 40% of India's LNG needs.
 - India is **Qatar's third-largest export destination for LNG.**
 - **E.g.** Petronet LNG Ltd. has secured a long-term agreement with QatarEnergy for the supply of 7.5 MT per annum of LNG to India, from 2028 to 2048.
- **Labor & Diaspora Cooperation:**
 - **Indian Community in Qatar:** Over 800,000 Indian workers contribute to Qatar's economy. Qatar has acknowledged their role in national development.
 - **E.g.** Indian workers were a significant part of Qatar's FIFA 2022 World Cup construction projects.
 - **Key Developments:**
 - MoU signed for labor rights & improved working conditions.
 - Better healthcare & insurance policies for Indian workers.
 - Regular India-Qatar labor dialogue for fair wages & employment opportunities.
- **Investment in Technology & Digital Innovation:**
 - **Artificial Intelligence (AI) & Robotics:** QIA has invested \$ 10 billion investment in AI, machine learning and robotics in India.
 - **Potential Collaborations:** AI-powered fintech solutions – Qatar can integrate Indian UPI and digital payments.
 - **Smart Cities & Digital Infrastructure:** Qatar to invest in India's Smart City Mission.
- **Defense & Security Cooperation:** India & Qatar share strong defense and security ties.
 - **E.g.** INS Kolkata participated in Doha International Maritime Defence Exhibition (DIMDEX).
 - **Key Developments:**
 - Agreement to combat **terrorism, cybercrime, money laundering, drug trafficking.**
 - Formation of **Joint Committee on Security & Law Enforcement.**
 - **Maritime Security:** Qatar is exploring Indian naval cooperation.
 - **Cybersecurity Cooperation:** Focus on preventing use of cyberspace for **radicalization and terrorism.**
- **Cultural & Educational Collaboration:**
 - **Education & Research Exchange:** Collaboration between Indian and Qatari universities in research & skill development. Increase in scholarships for Indian students in Qatar.
 - **E.g.** Qatar Foundation & IIT Delhi exploring joint AI research.
 - **Sports & Youth Affairs:** MoU signed on youth and sports development. Indian sports management firms collaborating with Qatari institutions.
 - **E.g.** Qatar's Aspire Academy to train Indian football coaches & athletes.

Geopolitical & Strategic Cooperation

- Qatar is a key player in Gulf & Middle Eastern diplomacy.
- India & Qatar cooperate on **regional security, counter-terrorism, and cyber threats.**
- Qatar's Geopolitical influence in Iran-Saudi relations, Israel-Palestine peace process and its proximity with Taliban will **help in creating diplomatic leverage for India.**
- **Significance for India:**
 - Ensures India's **strategic interests in the Middle East.**
 - Facilitates **energy security & trade routes through the Gulf.**
 - Provides **support in international negotiations** on security issues.

Challenges in India-Qatar Relations

- **Energy Dependence & Supply Volatility:**
 - India heavily relies on Qatar for LNG, Geopolitical disruptions or price fluctuations can impact India's energy security.
- **Labor and Migrant Worker Issues:**
 - **Indian workers** living in Qatar face periodic concerns over **labor rights, wages and working conditions.** Reforms in Qatar's labor laws have helped, but enforcement remains a challenge.
- **Geopolitical Balancing Act:**
 - India must carefully balance ties with **Qatar**, given Qatar's complex relations with Gulf neighbors.
- **Investment Barriers & Trade Deficit:**
 - While Qatar has pledged **\$10 billion investment in India**, bureaucratic hurdles and regulatory concerns **delay FDI flow.**
 - India imports more from Qatar (**LNG, petrochemicals**) than it exports, leading to a **trade imbalance.**
- **Security & Terrorism Concerns:**
 - **Terror financing and radicalization concerns** remain key issues in India's engagement with Gulf nations, including Qatar.
- **Defense & Strategic Cooperation Limitations:**
 - Unlike Saudi Arabia and UAE, **Qatar's defense ties with India are still developing.**
 - Limited defense exercises and security agreements restrict deeper **military engagement.**

Way Forward & Future Roadmap

- **Expanding Bilateral Trade & Investment:**
 - Implement the **\$10 billion Qatari investment** commitment in **infrastructure, energy, and technology** sectors to strengthen economic ties.
- **Enhancing Energy Security:**
 - Deepen LNG cooperation with long-term contracts beyond the 7.5 MTPA LNG deal to ensure stable and affordable energy supply.
- **Strengthening Defense & Security Cooperation:**
 - Increase joint military exercises, intelligence sharing, and cybersecurity collaboration to counter regional threats and terrorism.

- **Expanding Horizons in Space Cooperation:**
 - ISRO (Indian Space Research Organisation) can engage with **QASA (Qatar Aeronautics and Space Agency)** for bilateral collaboration in space exploration.
- **Promoting People-to-People Ties:**
 - Ensure better rights and welfare protections for the 800,000+ Indian expatriates working in Qatar through labor agreements and social security frameworks.
 - On the lines of **UAE (BAPS temple) India can collaborate in the field of tourism with Qatar.**
- **Advancing Regional & Strategic Cooperation:**
 - Collaborate on Middle East diplomacy, including Iran-Saudi relations, Israel-Palestine peace efforts and Afghanistan stability, to safeguard mutual interests.

Source:

- [The Hindu - India, Qatar elevate ties to strategic partnership](#)
- [Indian Express - India - Qatar](#)

