

## Today's Prelims Topics

### Time limit set for President to Assent Bills

#### Context

In a recent judgement in the 'State of Tamil Nadu vs Governor of Tamil Nadu', SC has set a timeline for the President to act on the Bills which the Governor has reserved for the President's assent.

#### Key Points of the Supreme Court Ruling

- **Three-Month Time Limit:**
  - The President must take a decision **within 3 months** from the date of receiving the Bill from the Governor.
  - If delayed, **appropriate reasons must be recorded and conveyed to the State government.**
  - This is the first time the Supreme Court has set a specific timeline for Presidential action under Article 201.
- **No Absolute Veto:**
  - The President **cannot** exercise an absolute veto.
  - **Withholding of assent must be justified** with clear, sound and specific reasons.
- **Reference to SC under Article 143:**
  - If a Governor reserves a Bill due to **perceived unconstitutionality**, the President is **expected to seek SC's opinion under Article 143.**
  - **Article 143** allows the President to seek **SC's advisory opinion** on legal or constitutional matters.
  - Although the reference is **not mandatory**, the President **ought** to seek the Supreme Court's opinion as a measure of prudence.
- **Quasi-Federal Balance:**
  - Article 201 must be **interpreted in the spirit of cooperative federalism.**
  - The **absence of a timeline** in the Constitution **does not mean indefinite delay is acceptable.**

#### Article-201 ➡ Reservation for President's consideration; He/She can

- Give assent to the bill
- Withhold assent to the bill
- Direct the governor to return the bill (**exception: money bill**) for reconsideration of the state legislature.

#### Reconsideration of Reserved Bills:

- The legislature must reconsider a returned Bill within six months.
- Once passed again, it is presented to the President.
- The President is **not obligated to grant assent to a reconsidered Bill.**

#### Commissions and Official Guidelines referred by SC

- **Sarkaria Commission (1983):** Recommended setting **definite timelines** for decisions under Article 201.
- **Punchhi Commission (2007):** Reiterated the need for **clear timelines** to prevent delays in legislative processes.
- **Ministry of Home Affairs (OMs dated 4 Feb 2016):** Two **Office Memorandums (OMs)** issued to all Ministries/Departments:
  - **3 months** for deciding on Bills reserved for the President
  - **3 weeks** for urgent ordinances,

#### Source:

- [Indian Express - SC on Article-201](#)

## Laser Weapon System

### Context

DRDO Successfully Tests Mk-II(A) Laser-Directed Energy Weapon (DEW) System. The system is fully indigenously designed and developed by **DRDO**.

### What are Laser Weapons?

- Laser weapons or DEWs are systems that use focused beams of light (laser) to damage, disable or destroy enemy targets.
- **LASER stands for:** Light Amplification by Stimulated Emission of Radiation.
- These weapons emit a **high-energy beam of coherent light**, often in the **infrared** or **visible spectrum**.
- With this achievement, **India** joins an elite group of countries, including **USA, China and Russia** that possess advanced laser weapon capabilities.
- **Advantages of Laser Weapons:**
  - **Speed-of-light engagement:** Instantaneous hit on target.
  - **Low cost per shot:** Only requires electrical energy (cheap compared to missiles).
  - **Stealth:** No sound, recoil or smoke trail.
  - **Precision:** High accuracy, minimizes collateral damage.
  - **Unlimited magazine:** Can be fired repeatedly as long as power is available.
- **Challenges associated:**
  - **High energy demand** limits mobile deployment.
  - **Laser performance drops** in rain, dust, fog or smoke.
  - Requires **direct visibility to the target**.



### Types of Laser Weapons

- **Tactical High-Energy Lasers (HELs):** Targets small UAVs, mortars, rockets etc..
  - Power: 10–100 kW.
  - E.g. DRDO's **Mk-II(A) DEW system**
- **Strategic High-Energy Lasers:** Targets missiles, aircraft and satellites at long ranges.
  - Power: Exceeds 100 kW or more.
- **Low-Power Lasers:** For non-lethal uses like blinding enemy sensors or disabling cameras.
  - Power: <10 kW
  - Used in riot control or temporary disabling missions.
- **Fiber Lasers:** Light is generated and amplified within fiber optics.

### Source:

- [The Hindu - Laser Weapons](#)

## Biomass Satellite

### Context

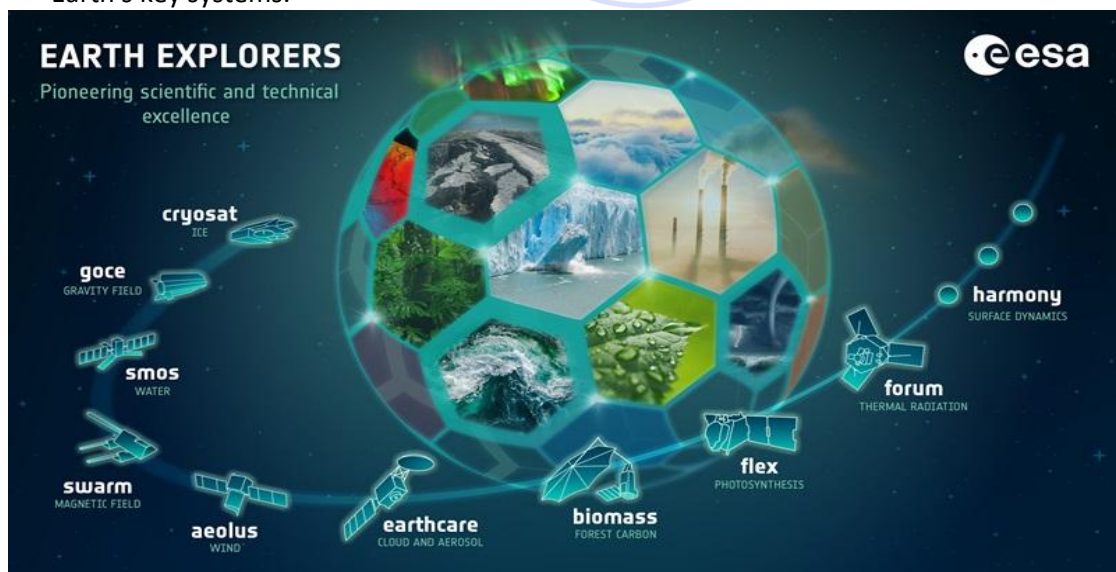
The European Space Agency (ESA) will launch its Biomass mission on April 29, 2025, aboard the Vega C rocket.

### About Biomass Satellite

- **Biomass** is a **European Space Agency (ESA)** Earth observation satellite.
- **Key Objectives of the Biomass Mission:**
  - Estimate Above-Ground Forest Biomass.
  - Provide **detailed 3D forest structure maps**.
  - Understand forest role in **carbon storage**.
  - Improve **climate change predictions** using accurate biomass data.
  - Observe **ice sheet movement** in Antarctica.
- **Satellite Payload:**
  - **Synthetic Aperture Radar (SAR)** for mapping Earth's surface.
  - It is fitted with a **large 12-meter antenna**.
  - **It is the First satellite to use P-band SAR** (long-wave radar):
    - Longer wavelengths can penetrate dense forest canopies enabling detection of biomass **from canopy to roots**.
    - **P-band SAR** can "see through" dense foliage. It can measure **carbon stored in branches, trunks and ground biomass**.
- Biomass is the **seventh mission under ESA's Earth Explorer programme**.



- **Earth Explorers programme** consists of a series of satellites that share the common goal of advancing Earth science by helping answer principal scientific questions through observation of Earth's key systems.



Source:

- [Indian Express - Biomass Mission](#)

## Genome India Project

### Context

The first phase of the **Genome India Project** is now complete. It has successfully catalogued entire genome sequences of **10,000** individuals representing **83 diverse population groups** from across India.

### About Genome India Project (GIP)

- It was launched by the Department of Biotechnology (DBT) in **2020**.
- **Aim:** To **sequence the genomes** from **diverse** socio-economic, geographical and linguistic backgrounds to create a comprehensive **genomic database of the Indian population**.
- The project involves about **20 institutions across India** and with analysis and coordination done by the **Centre for Brain Research at IISc, Bangalore**.
- **Phase 1:** Sequencing of **10,000 genomes** from **99 ethnic populations**.
- **Future Goal:** Expand to sequence up to **1 million genomes**.
- **Genome India Database:**
  - It will be housed at the **Indian Biological Data Centre (IBDC)** in Faridabad, Haryana.
  - It will be **open to global researchers** adhering to data-sharing and privacy policies.
- **Privacy Measures:** Data is anonymized with numeric codes and access requires proposals vetted by an independent panel.

### What is Genome Sequencing?

- It is a laboratory technique that determines the order of the chemical building blocks of an organism's DNA or RNA.
- Major genome sequencing methods are the **clone-by-clone method** and the **whole genome shotgun sequencing**.
- It involves reading the order of nucleotide bases (**adenine, guanine, cytosine, and thymine**) that make up the DNA molecules in an organism's genome.
  - **Genome v/s Gene:** Genome is the entire set of genetic material or DNA, while gene is a **specific segment of DNA** that codes for a **particular protein or RNA molecule**

### Why is a Genetic Database Important?

- **Understanding Genetic Diseases:** It helps identify genetic risk factors and develop targeted therapies and diagnostic tests. **E.g.** Gene-modifying therapies to treat diseases.
- **Discovery of New Variants:** Project Identified **135 million genetic variations** in 10,000 genomes. **7 million of these variations** are absent in global databases.
- **Population-Specific Insights:** Provides insights into the frequency and impact of certain mutations.
- **Rare Disease Identification:** Facilitates the development of gene therapies for rare diseases.
- **Drug Resistance Research:** Identifies genetic variants affecting medication efficacy.
  - **E.g.** A South Indian Vaishya community lacks the gene to process common anaesthetics, leading to prolonged effects or death.

### Global Genome Sequencing Projects

- **Human Genome Project (2003):** First complete human genome by an international consortium funded by the US National Institutes of Health.
- **1,000 Genome Project (2012):** It is an international collaboration between research groups in US, UK, China and Germany
- **European 1+ Million Genome Project:** Ongoing effort across **24 countries** to sequence over 1 million genomes.

Source: [Indian Express - Genome India Project](#)

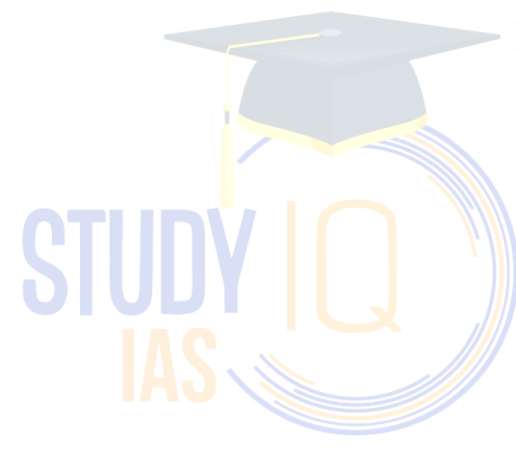
## Places in News

### Morag Axis



- Morag axis is a newly established Israeli-controlled corridor in Gaza.
- It cuts **between the southern cities of Rafah and Khan Yunis**, linking to the **Philadelphi Route** (along the Egypt-Gaza border).
- It creates a **wider Israeli-controlled "security zone"**, allowing the Israeli military to:
  - Sever southern Gaza into segments.
  - Control movement within Gaza.

Source: [Mint - Morag Axis](#)



## News in Shorts

### BatEchoMon

- BatEchoMon is a **fully automated bat detection and classification system**, and the **first of its kind in India**.
- **Developed by:** Kadambari Deshpande and Vedant Barje at the Indian Institute for Human Settlements (IIHS), Bengaluru.
- It uses **Audiomoth** as an ultrasonic detector and a **Raspberry Pi microprocessor** for data processing.
- It is the **First system globally** to integrate **recording + real-time classification**.
- **Features:**
  - Activates **automatically at sunset** when bats begin flying.
  - **Records, stores, processes** and **analyses** bat activity autonomously.
  - Identifies **species-wise bat calls, activity levels** and **behavioral patterns**.
  - It costs only about **one-third** of advanced international detectors.

Source:

- [The Hindu - BatEchoMon](#)

### BhashaNet Portal

- Many Union government websites have started using a Hindi Web address.

#### About Universal Acceptance (UA)

- It is a global movement aimed at making the **Internet more accessible in languages other than English**.
- It advocates for:
  - **Internationalised Domain Names (IDNs)** – Web addresses in non-English scripts.
  - **Internationalised email addresses** – Email addresses in regional languages.
- The **Domain Name System (DNS)** historically supported only **ASCII** (English-based character set).

### BhashaNet Portal

- It is a government initiative focused on promoting the use of **Indian language domain names and email addresses**, aligning with the principles of Universal Acceptance (UA) and multilingual internet access.
- It aims to create a multilingual internet environment where users can easily access and interact with online content in their local languages.
- **It is operated by:** MeitY & National Internet Exchange of India (NIXI).

Source:

- [The Hindu - BhashaNet portal](#)

### First global carbon tax on shipping

- The first-ever global carbon tax on the shipping industry was passed at the International Maritime Organisation (IMO) meeting recently.
- **Objective of the Carbon Tax:**
  - To reduce greenhouse gas (GHG) emissions from the global shipping industry.
  - To promote the use of lower-emission fuels and cleaner maritime technologies.
- **Implementation Timeline:** Starting by 2028;

- **Compliance:** Ships must shift to cleaner fuels or pay a carbon fee based on the pollution they generate.
- **Major countries who voted in favor:** India, China & Brazil.

#### About International Maritime Organisation (IMO)

- It is a **specialized agency of the United Nations** responsible for regulating international maritime transport.
- Its primary focus is to ensure the safety and security of shipping, prevent marine pollution and address legal matters related to international maritime traffic.
- It was **established in 1948** as Inter-Governmental Maritime Consultative Organization (**IMCO**). It was officially renamed **International Maritime Organization in 1982**.
- **Membership:** 176 Member States & 3 Associate members. (India joined IMO in 1959)
- **Currently India is a council member of IMO** under the Category of 10 states with "the largest interest in international seaborne trade"



#### Source:

- [The Hindu - Global Carbon Tax](#)

#### Signet Ring Cell Carcinoma (SRCC)

- SRCC is a rare and aggressive subtype of **colorectal cancer (CRC)**.
- **Key characteristics:**
  - **Highly aggressive and rapidly spreading**, especially to the **peritoneum** (lining of the abdominal cavity).
  - Resistant to conventional chemotherapy.
  - **Poor prognosis**, usually diagnosed at an **advanced stage**.
- It is named after its unique microscopic appearance resembling a signet ring.
- **Prevalence in India:**
  - SRCC accounts for **~1% of all colorectal cancer (CRC) cases worldwide**.
  - It is **10 times more common in India** than global averages, affecting **younger individuals** disproportionately.
  - **Central and Northern India** report the highest number of SRCC cases.

#### Source:

- [Indian Express - SRCC](#)

#### Phawngpui National Park

- Recently erupted forest fires in several parts of **Mizoram's Phawngpui National Park** have affected nearly **one-ninth** of the park's total area.

#### About Phawngpui National Park

- **Location:** Lawngtlai district of Mizoram, near the India-Myanmar border.
- It is also known as **Blue Mountain National Park**.
- It is a **sacred place** for local mizo people, they believe it is inhabited by the spirits of their ancestors.



- The name "**Phawngpui**" is derived from the local **Lai** language, where "phawng" means "meadow" and "pui" means "great," reflecting the park's expansive meadows.
- Phwangpui is the **highest peak of Mizoram. (2157 m.)**.
- **Flora:** Montane Subtropical forests including oak, rhododendrons and rare species of bamboos.
- **Fauna:** Slow Loris, Tiger, Leopard, Leopard Cat, Serow, Asiatic Black Bear, Stump-tailed Macaque and Capped Langur.
- **Avifauna:** Rare Blyth's Tragopan, Dark Rumped Swift etc.

Source:

- [Hindustan Times - Phawngpui NP](#)

### Saras- Mk II plane

- The **first test flight of India's indigenously designed Saras Mk2 aircraft** is expected in December 2027.

#### About Saras-Mk II Plane

- **Saras Mk2** is an upgraded version of India's indigenously designed **civilian aircraft** developed by **CSIR-NAL (National Aerospace Laboratories)**.
- It is a **19-seater multi-role aircraft**, aimed primarily at connecting **tier-2 and tier-3 towns** where big airports are not available.
- **Multi-utility Role:** It can serve as a commuter aircraft, air ambulance, charter operations in remote locations.



Source:

- [The Hindu - Saras](#)



## Editorial Summary

### US-Iran Nuclear Talks

#### Context

Recently Iran's Foreign Minister Abbas Araghchi and US Special Envoy Steve Witkoff held **indirect talks** in **Muscat (Oman)**.

#### Why Is Iran Willing to Talk Now?

- **Generational Shift in Iran:**
  - **Average Iranian is 32 years.** Younger generations have **not experienced** the 1979 Islamic Revolution, the Iran-Iraq War or the 1989 leadership transition.
  - They are **more concerned about jobs and economy** than ideology.
- **Economic Pressure:**
  - Iran is facing **double-digit inflation** and **high unemployment**.
    - **E.g.** Iran's currency **Rial** has depreciated to an all-time low of over **1 million rials per US dollar**.
  - The government sees foreign investment as necessary for survival.
    - **E.g.** In August 2024, President **Masoud Pezeshkian** said Iran needs **\$100 billion in foreign investment**.
- **Shift in Domestic Politics:**
  - Reformists are pushing for a deal to get **sanctions relief**.
  - Conservatives, despite their majority in Parliament, are **not obstructing negotiations**.
    - **E.g.** Supreme Leader Khamenei (85 years old) is seen to be open to deals for regime stability.
- **Shifting Geopolitics:**
  - **Weakened 'Axis of Resistance':**
    - Iran's regional influence via its **"Axis of Resistance"** (Hezbollah, Houthis, etc.) is **weakened**.
  - **Changing Arab Views:**
    - Countries like **Saudi Arabia**, who earlier opposed the 2015 deal, now **support a negotiated solution** and **economic engagement with Iran**.
  - **Russia's Changing Stance:**
    - **Russia, although** supported Tehran's nuclear stance post-Ukraine war, is now **reiterating support** for a deal.

#### The Iran-Trump Equation: From Hostility to Pragmatism

- **History of Talks:**
  - Iran has negotiated with the **E3** (France, Germany, UK) since **2003** and with the **US** since **2013**.
  - These talks often happen while the US **increases military threats** to gain leverage.
- **Impact of Trump's 2018 Withdrawal:**
  - Trump pulled out of the **2015 JCPOA** nuclear deal.
  - Iran responded with:
    - **Greater uranium enrichment** (up to 60%)
    - A **"no war, no talks"** stance announced by Khamenei in 2018.
  - Iran's distrust of US intensified after: **Assassination of Gen. Qassem Soleimani in Jan 2020**.
  - Despite this, **Iran didn't fully abandon diplomacy** — keeping room open for talks.

### Joint Comprehensive Plan of Action (JCPOA) - 2015

- It is a landmark nuclear agreement **between Iran and a group of world powers - P5+1**:
  - **P5**: Permanent members of the UN Security Council- **US, UK, France, Russia, China**
  - **+1 - Germany**
- **Key Terms of the JCPOA**:
  - Iran agreed to enrich uranium only up to **3.67%** (far below the ~90% needed for weapons).
  - Iran would cut its stockpile by **98%**, from ~10,000 kg to 300 kg.
  - The **Fordow underground facility** could not be used to enrich uranium for 15 years.
  - The **IAEA (International Atomic Energy Agency)** was given full access to nuclear sites.
  - **Iran got relief from US, EU and UN sanctions.**

- **Strategic Patience**:
  - Iran avoided formally rejoining the **JCPOA under Biden** (2021–22 Vienna talks).
  - This approach has allowed it to now **negotiate a new deal under Trump**, giving him a chance to claim success.

### What's Likely Next?

- **Shared Goals**:
  - **US** wants: Iran's **nuclear disarmament**.
  - Iran wants: Sanctions relief and economic engagement.
- **Iran's Religious Position**:
  - **Supreme Leader Khamenei's fatwa** prohibits **nuclear weapons**.
  - Iran maintains nuclear enrichment is **defensive**, not offensive.
- **Potential Roadblocks**:
  - Trump may **demand more** than just disarmament:
    - Curtailment of Iran's ballistic missile program
    - **Ending support to proxy groups** (Houthis, Hezbollah)
- **Israel**:
  - **Israel wants a full stop** to Iran's nuclear activity. Netanyahu favours a **military option** over diplomacy.
  - However, if **Arab states support Iran** during Trump's upcoming regional visit, Netanyahu's ability to block a deal may weaken.
- **Can the Deal Happen**:
  - **Khamenei has given Araghchi full authority** to negotiate.
  - **Blueprint from 2015 (JCPOA)** still exists; it can be updated quickly.

### Source:

- [Indian Express - US-Iran](#)