

## Current Affairs - 17 March 2026

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### WHAT ARE PETROGLYPHS?



#### **Petroglyphs**

Researchers recently found two ancient rock carvings (petroglyphs) on a flat rock inside a rock shelter on a hill behind

Beerappa Temple in Manchirevula, Telangana.

- Petroglyphs (also known as **rock engravings**) are **symbolic images sculpted or engraved on the surface of rocks** by removing material from its surface layer with instruments of superior hardness.
- The **techniques used** to create these images include **pecking, incising, abrading, sculpting, polishing, drilling, and scratching**.
- These processes **remove part of the rock** and therefore are **different from images simply painted** or drawn on rock, which are called **petrographs**.
- The word "petroglyph" is **derived from two Greek words**, "petros" meaning "stone," and "glyphein" meaning "to carve."
- Petroglyphs are typically **associated with prehistoric populations** and can be **found on every continent** throughout the world, **except Antarctica**.
- However, they are **especially concentrated in Africa, South America, North America** (mainly in the southwestern United States), **Siberia, Australia, and Europe** (Scandinavia, Spanish Galicia, Ireland and Italy).
- **Example of Petroglyph Site in India: Edakkal Caves in Wayanad, Kerala.**
- Significance of Petroglyphs:
  - They are among the **earliest forms of art** to have existed and are therefore considered the **foundation of art**.
  - Ancient peoples also used petroglyphs as a **form of communication or writing**.
  - Additionally, **some petroglyphs served as musical instruments** and were known as "**rock gongs**."



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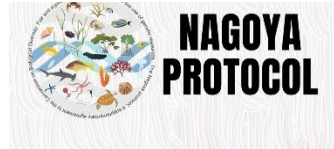
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### NAGOYA PROTOCOL



- The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) to the Convention on Biological Diversity is a supplementary agreement to the Convention on Biological Diversity.
- It was adopted **on 29 October 2010 in Nagoya, Japan.**
- It entered into force on 12 October 2014, 90 days after the deposit of the fiftieth instrument of ratification.
- It provides a transparent legal framework for the **effective implementation of the fair and equitable sharing of benefits** arising out of the utilization of genetic resources.
  - **India** has ratified it in **2012.**
- **What it covers?**
  - It applies to genetic resources that are **covered by the CBD**, and to the benefits arising from their utilization.
  - It covers **traditional knowledge (TK) associated with genetic resources** that are covered by the CBD and the benefits arising from its utilization.

### **Key Facts about Convention on Biological Diversity (CBD):**

- It is the most comprehensive **binding international agreement** in the field of nature conservation and the **sustainable use of natural resources.**
- It was opened for signing at the UN Conference on Environment and Development in Rio de Janeiro in 1992.
- **It has three overarching objectives:**
  - **Conservation of biological diversity** (genetic diversity, species diversity, and habitat diversity)
  - **Sustainable use of biological diversity**
  - **Fair and equitable sharing** of the benefits of the utilisation of genetic resources.

### NAVIC ATOMIC CLOCK FAILURE AND INDIA'S GPS AMBITIONS

- The Indian Regional Navigation Satellite System (IRNSS), also known as Navigation with Indian Constellation (NavIC), is India's satellite-based navigation system designed to provide positioning services over India and up to 1,500 km beyond its borders.
- NavIC was planned as a **seven-satellite constellation**, similar in concept to the U.S. Global Positioning System (GPS), to deliver reliable navigation and timing information across the region.
- When fully operational, NavIC is designed to provide **location accuracy of about 10 metres** over India and neighbouring areas.
- Because its satellites are positioned directly above the region, signals are stronger and more reliable in challenging terrains such as valleys and forests.

#### **Status of NavIC Satellites Providing Positioning Data**

- After the 2023 launch, five satellites in the NavIC constellation were capable of providing positioning data: **IRNSS-1B, IRNSS-1C, IRNSS-1F, IRNSS-1I, and NVS-01** (a new-generation NavIC satellite).
- With the failure of the atomic clock on IRNSS-1F, the satellite can no longer provide positioning data, reducing the number of operational satellites in the system.

#### **NVS-02 Satellite and Its Failure**

- NVS-02, the second satellite of the new-generation NavIC series, was launched in January 2025 aboard GSLV-F15 during **ISRO's 100th mission** and placed in a highly elliptical transfer orbit.
- The satellite failed to move into its intended operational orbit due to an electrical malfunction that prevented the engine from igniting.
- A review committee found that the signal required to activate the pyro valve in the oxidiser line did not reach the engine.
  - This likely occurred because a connector contact disengaged, breaking the electrical circuit.

### Advancements in New-Generation NavIC Satellites

- **Indigenous Atomic Clocks** - A key upgrade is the development of indigenous atomic clocks by ISRO, reducing dependence on foreign systems and addressing earlier failures that affected positioning accuracy.
- **Importance of Atomic Clocks** - Satellite navigation relies on precise time measurement to calculate location. Failures in atomic clocks previously disrupted accurate positioning, making this upgrade crucial for reliability.
- **Extended Mission Life** - The new-generation satellites have an extended lifespan of 12 years, compared to 10 years for earlier satellites, ensuring longer operational stability.
- **Addition of L1 Frequency Band** - Along with existing L5 and S bands, new satellites transmit in the L1 frequency, which is widely used by global systems like GPS.
- **Improved Interoperability and Usability** - The inclusion of the L1 band enhances compatibility with global navigation systems and enables usage in low-power devices like smartphones and smartwatches, expanding NavIC's applications.

### Global Satellite Navigation Systems

- There are four primary global navigation satellite systems (GNSS):
  - US – GPS (Global Positioning System)
  - Russia – GLONASS
  - Europe – Galileo
  - China – BeiDou
- These systems provide worldwide positioning, navigation, and timing services.
- **Regional Navigation Systems**
  - Some countries operate regional systems:
    - India – NavIC (IRNSS) with 7 satellites
    - Japan – QZSS (Quasi-Zenith Satellite System) with 4 satellites, mainly augmenting GPS over Japan

### ELECTRIC COOKING: THE NEXT STEP IN INDIA'S ENERGY TRANSITION

- India rapidly expanded LPG access from 150 million connections in 2015 to 332 million by 2025, but the **model relies heavily on imports**.
- The country imports about 60% of its LPG and 50% of its natural gas, pushing the combined import bill to \$26.4 billion in FY 2024–25, according to IEEFA.
- This growing dependence makes Indian households vulnerable to price shocks from geopolitical tensions in West Asia, indicating that gas-based clean cooking has reached an affordability and sustainability limit.

#### Electric Cooking vs Gas: Cost and Efficiency Comparison

- Studies indicate that electric cooking is cheaper than gas-based cooking.
- An IEEFA analysis found electric cooking to be **37% cheaper** than non-subsidised LPG and **14% cheaper** than piped natural gas for a typical urban household.
- Electric cooking technologies are significantly **more efficient**. Induction cooktops transfer about 85% of energy to the vessel, compared with around 40% efficiency for LPG burners.
- **Challenges for Indian Cooking Practices**
  - Indian cooking often requires multiple pots and simultaneous preparation, making single-plate induction stoves insufficient. Experts suggest developing multi-pot and flame-replicating induction technologies to improve adoption.
  - Policy experts recommend starting electrification in urban kitchens, which would reduce LPG demand and allow limited gas supplies to support rural households lacking reliable electricity.
- **Concerns About Grid Capacity**
  - Large-scale adoption of electric cooking could increase evening electricity demand.
  - This raises concerns about grid stability and power supply management if millions of households shift to electric appliances simultaneously.

### Rooftop Solar and Local Energy Trading to Reduce Grid Stress

- A rooftop solar system combined with battery storage can turn households into prosumers—both producers and consumers of electricity.
- Solar panels generate power during the day, store surplus energy in batteries, and use it later during evening peak demand.
- Using stored solar energy in the evening can offset the surge in electricity demand that may occur if millions of households adopt electric cooking simultaneously.
- **Growth of Rooftop Solar in India**
  - India's rooftop solar capacity is expected to increase from 24 GW in 2026 to over 41 GW by 2030.
  - This is supported by initiatives like the **PM-Surya Ghar Yojana**, which aims to provide free electricity to millions of households.
- **Peer-to-Peer Energy Trading**
  - Peer-to-peer (P2P) energy trading allows households to sell surplus solar electricity directly to neighbours through digital platforms, reducing reliance on traditional distribution companies.
  - India's first blockchain-based P2P solar trading pilot in Lucknow enabled real-time energy trading through smart contracts and reduced energy purchase costs by about 43%.
  - When neighbourhoods share solar energy locally, evening electricity peaks decline, distribution companies avoid expensive power purchases, and communities effectively function as micro-level virtual power plants.

### Conclusion

- Reducing dependence on imported LPG—much of which passes through vulnerable maritime routes such as the Strait of Hormuz—would strengthen India's energy security and economic resilience.



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### VELA CARLI



- Vela carli is an **endemic freshwater crab** found only in the forests and streams of the **Central Western Ghats**.
- It belongs to family **Gecarcinucidae**.
- It is for the first instance it **showed gynandromorphy** (a rare condition in which individuals exhibit both male and female characteristics)
- The bodies of the **crabs displayed male reproductive structures**, while other parts showcased **female features, including gonopores**
- It is **rare in crustaceans** and has never before been reported in the freshwater crab family Gecarcinucidae.

### **Key Facts about Silent Valley National Park**

- **Location:** It is located in Kerala.
- It constitutes the centerpiece of the **Nilgiri Biosphere Reserve**, sanctified as a World Heritage Site by UNESCO in 2012.
- **River:** It is nourished by the **Kunthipuzha River**.
- **Vegetation:** It has **four types of vegetation** “West Coast tropical evergreen forest, southern sub-tropical broad-leaved hill forest, montane wet temperature forest, and grasslands.

**Flora:** The flora of the valley includes about 1000 species of flowering plants, 107 species of orchids, 100 ferns and fern allies, 200 liverworts, 75 lichens, and about 200 algae.

**Fauna:** It is famous for its population of lion-tailed macaques, Nilgiri langur, Malabar giant squirrel, Indian elephant, tiger, leopard, and gaur (Indian bison).



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### SAHITYA AKADEMI AWARD



- It is awarded for the **most outstanding books of literary merit published** in any of the major Indian languages recognised by the Akademi.
- **Languages Recognised:** Along with the **22 languages enumerated in the Constitution of India**, the Sahitya Akademi has recognised **English and Rajasthani** as languages in which its programme may be implemented.
- **Award:** The authors and poets will receive a plaque, a **shawl and an amount of ₹1 lakh** in an award.

### **Key facts about the Sahitya Akademi**

- It was formally inaugurated by the Government of India on 12 March 1954.
- It was **registered** as a society under the **Societies Registration Act, 1860**.
- It is the central institution for **literary dialogue, publication and promotion** in the country and the only institution that undertakes literary activities in 24 Indian languages, including English.
- **Nodal Ministry:** Ministry of Culture.
- **Head office:** New Delhi.

### KANHA TIGER RESERVE



- **Location:** It is located in the “Maikal” ranges of the Satpuras in the state of **Madhya Pradesh**.

**Corridor:** It has an active corridor **between Kanha and Pench Tiger Reserves**. Kanha is also connected with the **Achanakmar Tiger Reserve** of Chhattisgarh State.



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**Terrain:** It is characterized mainly by forested shallow undulations, hills with varying degrees of slopes, plateaus, and valleys.

**Tribal Communities:** The region is known for some of the ancient tribal communities, like the **Gond and Baiga still inhabit the region.**

It is also the first tiger reserve in India to officially introduce a mascot, “**Bhoorsingh the Barasingha**”.

**Vegetation:** It primarily consists of a moist Sal and **moist mixed deciduous forest.**

**Flora:** Bamboo, Tendu, Sal, Jamun, Arjun, and Lendia flourish.

**Fauna:** The Park has a significant population of **Royal Bengal Tigers**, leopards, sloth bears, and Indian wild dogs.

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