DAILY CURRENT AFFAIRS 24-02-2026

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Floreana Island

Syllabus: Prelims Bits - Mapping

Context:

- **Reintroduction of giant tortoises:** Over **150 giant tortoises** have recently been reintroduced to **Floreana Island**, marking a major ecological restoration effort after the native tortoise population vanished more than a century ago due to overexploitation and invasive species.

Geographical Location

- Floreana (officially **Santa Maria**) lies at the **southern end of the Galápagos Archipelago**, off the western coast of **Ecuador**.
- Located about **1,000 km from mainland Ecuador** in the Pacific Ocean.
- Area: **~173 sq. km**
- Geological origin: **Volcanic island**

Ecological Features

- Contains diverse habitats:
  - Coastal lagoons
  - Volcanic highlands
  - Offshore reefs
- Known as an important **ecological restoration site** due to historical biodiversity loss.

- Holds **54 IUCN Red-Listed species**, the highest concentration among Galápagos islands affected by invasive mammals.

Historical Significance

- **First island colonised by Ecuadorians (1832).**
- Functioned briefly as a **penal colony**, abandoned mainly due to freshwater scarcity.
- Famous for **Post Office Bay**, where an **18th-century barrel mail system** still operates informally among visitors.

Human Settlement & Livelihood

- Population: **~150 residents**
- Main settlement: **Puerto Velasco Ibarra**
- Primary livelihood: **Small-scale farming**
- Freshwater constraint: **Single natural pond** replenished mainly during rainy season.

Invasive Species & Conservation

- Historically impacted by introduced **goats and other invasive mammals**.
- **Eradication programme (2007)** by the Galápagos National Park Directorate removed goats, enabling ecosystem recovery.
- Current conservation focus includes **species rewilding, habitat restoration, and invasive species management**.

Taftan Volcano

Syllabus: Prelims Bits – Volcanoes.

Context:

- **Surface uplift observed:** The **Taftan Volcano** in southeastern Iran has **risen ~3.5 inches (≈9 cm) over 10 months**.
- The uplift indicates **ongoing subsurface magma or hydrothermal movement**, though **no eruption warning** has been issued.

Location & Physical Features

- **Type:** Stratovolcano
- **Location:** Southeastern **Iran**, near the **Pakistan** border
- **Elevation:** ~4,000 m — **highest peak in southeastern Iran**

- **Summits:**
  - Narkuh
  - Matherkuh

Geological Characteristics

- Part of the **Makran continental volcanic arc** formed due to **subduction of the Arabian Plate beneath the Eurasian Plate**.
- **Only active volcano** in this volcanic arc.
- Hosts an **active hydrothermal system** with:
  - **Fumaroles** emitting sulfur-rich gases
  - Persistent heat and gas release near the summit

Eruptive History

- **No recorded eruptions in human history**
- Estimated **last major eruption:** ~700,000 years ago
- Continued fumarolic activity indicates **latent magmatic heat and geothermal processes**

Internal Energy Agency

Syllabus: GS-2: International Organisations.

Context:

- Energy ministers from **54 countries** reaffirmed cooperation on:

- Energy security
- Critical minerals supply chains
- Clean energy transition

- The ministerial meeting highlighted the need for **resilient supply chains**, **accelerated decarbonisation**, and **technology collaboration**.

About the International Energy Agency

Nature

- An autonomous intergovernmental organisation functioning within the framework of the Organisation for Economic Co-operation and Development (OECD).
- Works with governments and industry to ensure a **secure, affordable, and sustainable energy system**.

Background

- **Established:1974**
- **Context:** Created after the **1973–74 oil crisis** to coordinate collective response to oil supply disruptions.
- Continues to maintain **strategic oil security coordination** among members.

Mandate

- Tracking and analysing global energy trends.
- Providing policy recommendations.
- Promoting clean energy innovation and technology cooperation.
- Facilitating emergency response mechanisms.

Core Focus Areas

- Energy security
- Economic development
- Environmental sustainability
- Global engagement and partnerships

Membership

- 31 Member countries
- 11 Association countries
- Membership requirement: Must be an OECD member.

- **India** became an **Association country in 2017**, enabling deeper policy cooperation and data exchange.

Headquarters

- Paris, France

Major Reports Published by IEA

- World Energy Outlook (flagship report)
- World Energy Balances
- Energy Technology Perspectives
- World Energy Statistics
- Net Zero by 2050 Roadmap

Prelims Perspective

- IEA is **not a UN body**.
- Full membership is limited to **OECD countries**.
- India is an **Association country**, not a full member.

AI in preventing Heart Attack

Syllabus: GS-3: Science and Technology – Artificial Intelligence.

Context:

Dr. Ziad Obermeyer (UC Berkeley) and his team are leading a breakthrough trial in **Tamil Nadu, India**, using AI-integrated portable ECGs to detect "silent heart attacks" that standard clinical interpretations often miss.

Understanding Silent Heart Attacks

- **Medical Term:** Unrecognized Myocardial Infarction (UMI).
- **Definition:** A heart attack that occurs with **minimal, non-specific, or no symptoms** (asymptomatic).
- **Atypical Symptoms:** Instead of crushing chest pain, patients may feel:
  - Unexplained fatigue or "flu-like" symptoms.
  - Indigestion or heartburn.
  - Mild discomfort in the jaw, neck, or back.
- **Risks:** Because they go untreated, they significantly increase the risk of **Heart Failure**, **Stroke**, and **Sudden Cardiac Death**.

The AI-ECG Breakthrough: How it Works

Traditional ECGs record the heart's electrical activity, but human clinicians may miss subtle "signatures" of past muscle damage.

- **The Technology:** A portable, low-cost electronic pad connected to a **smartphone app**.
- **The AI Role:** Uses **Deep Learning (Convolutional Neural Networks)** to analyze raw waveform data.
- **Pattern Recognition:** It identifies high-dimensional patterns and "hidden" indicators of cardiac injury that are invisible to the human eye.
- **Utility:** Acts as an **"opportunistic screening"** tool that can rule out disease in 90–95% of patients or flag high-risk cases for immediate specialist referral.

Significance of the Tamil Nadu Trial

The trial is a "gamechanger" for public health in developing nations like India for several reasons:

- **Scalability:** Uses low-cost, existing technology (ECG) rather than expensive imaging like Cardiac MRIs.
- **Democratizing Healthcare:** Brings specialist-level diagnostic accuracy to primary health centers (PHCs) and rural areas where cardiologists are scarce.
- **Diverse Data:** Training AI on non-Western populations (like the TN cohort) addresses **algorithmic bias**, ensuring the tool is accurate for Indian phenotypes.
- **Preventive Shift:** Moves the healthcare model from "reactive" (treating a crisis) to "proactive" (preventing failure by detecting past damage).

The "Triple Burden" & AI

Dimension	Impact of AI-ECG
Public Health	Addresses the rising burden of Non-Communicable Diseases (NCDs) in India.
Economic	Reduces the long-term cost of treating advanced heart failure through early intervention.
Technological	Demonstrates the shift toward **Precision Medicine** and AI-human collaboration.

Challenges and Ethical Considerations

- **Validation:** AI tools must be "decision-support" systems, not replacements for clinical judgment.

- **Data Privacy:** Protecting sensitive patient cardiovascular data in cloud-based AI systems.
- **Regulatory Framework:** The need for standardized protocols for AI medical devices in India (CDSCO oversight).

Satellite Phones

Syllabus: GS-3: Science and Technology – Communication Technology.

Context:

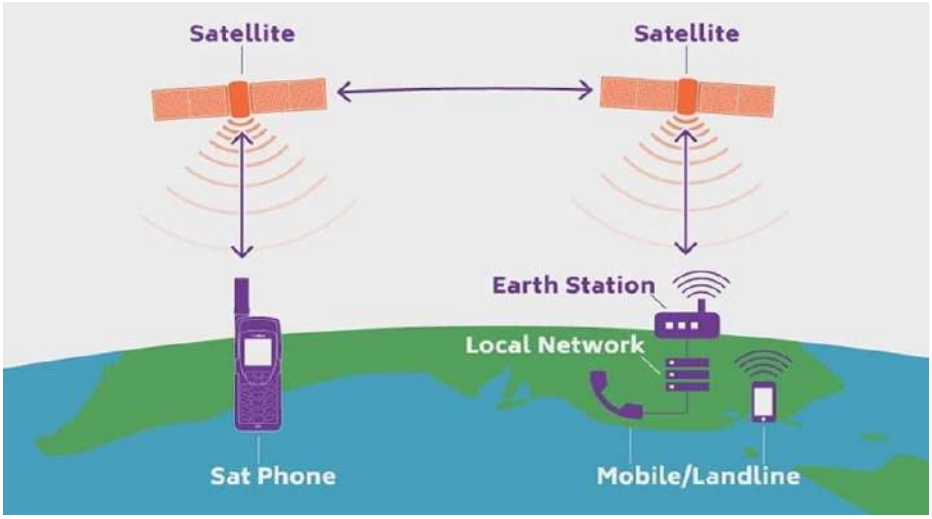
Security agencies alert on illegal use of satellite phones in Indian waters.

What is a Satellite Phone?

- A **satellite phone (satphone)** is a mobile communication device that connects **directly to orbiting satellites** instead of terrestrial cellular towers.
- Enables **voice calls, SMS, and low-bandwidth data** in **remote, disaster-hit, maritime, and conflict areas** where conventional networks are unavailable.

How Satellite Phones Work

- Operate through **satellite constellations** in:
  - **Low Earth Orbit (LEO)** – low latency, global coverage.
  - **Geostationary Orbit (GEO)** – wide regional coverage but higher latency.
- Signal path: **Satphone → Satellite → Ground station → Public telecom network**.



Major Satellite Phone Service Providers

- **Iridium** – LEO constellation, true global coverage including poles.

- **Inmarsat** – GEO satellites, maritime and aviation dominance.
- **Thuraya** – Regional coverage (Europe, Africa, Middle East, Asia).
- **Globalstar** – LEO constellation with regional limitations.

Advantages

- **Connectivity in remote areas** – mountains, oceans, deserts.
- **Disaster resilience** when terrestrial infrastructure collapses.
- Crucial for **defence, disaster management, maritime safety, and exploration**.
- Supports **search and rescue operations**.

Limitations

- **High cost** of devices and call tariffs.
- **Bulky handsets** with limited battery life.
- **Weather and obstruction sensitivity** (dense buildings, forests).
- **Low data speeds** compared to 4G/5G.

Satellite Phones in India — Regulatory Framework

- Satellite phones are **strictly regulated** due to **national security concerns**.

Legal Provisions

- Governed by:
  - Indian Wireless Telegraphy Act, 1933
  - Indian Telegraph Act, 1885
- Use without permission can lead to **penalties and confiscation**.

Permitted Use

- Allowed only with **prior approval** from the **Department of Telecommunications (DoT)**.
- Currently permitted mainly on **Inmarsat network via BSNL gateway**.
- Widely used by:
  - Disaster response agencies
  - Armed forces
  - Maritime sector
  - Government expeditions

Importance for India

- **Disaster management:** Cyclones, earthquakes, landslides (e.g., Uttarakhand floods).
- **Border and remote region connectivity:** Himalayas, islands, deserts.
- **Fishermen safety and maritime security**.
- Supports **Digital India inclusion in difficult terrains**.

Recent Developments & Trends

- Integration with **satellite internet constellations (LEO mega-constellations)**.
- Increasing role in **emergency communication under NDMA frameworks**.
- Discussions on **expanding satellite communication ecosystem** alongside India's space reforms.

Challenges

- **Security risks** due to difficulty in interception.
- **Spectrum management and licensing complexities**.
- Affordability and lack of awareness.
- Dependence on foreign satellite infrastructure.

Way Forward

- Develop **indigenous satcom ecosystem** aligned with **Atmanirbhar Bharat**.
- Controlled expansion for **disaster resilience and strategic connectivity**.
- Integration with **NavIC and Indian satcom capabilities**.
- Clear regulatory framework balancing **security and accessibility**.