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Daily Current Affairs
🎯 To The Point
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Table Of Content — 05 June 2025

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1 India and Japan Strengthen Maritime Ties for a Sustainable Indo-Pacific

Context: In a significant move toward enhancing regional maritime collaboration, **India and Japan have agreed to deepen their maritime cooperation**, reflecting their mutual commitment to ensuring peace, security, and sustainable development in the **Indo-Pacific** region.

Key Pillars of India–Japan Maritime Collaboration:

Smart Island Development & Renewable Energy:

- Japan will assist in transforming **Andaman & Nicobar** and **Lakshadweep Islands** into **smart, sustainable, and disaster-resilient maritime zones**, powered by **renewable energy** and equipped with **eco-friendly infrastructure**.

Digital Ports & Emission Reduction:

- Both countries have committed to **port digitisation** to boost operational efficiency, reduce logistics costs, and **cut carbon emissions**. This aligns with India's **Smart Port initiative** and Japan's green maritime goals.

Employment & Seafarer Skill Development:

- With **over 1.54 lakh trained Indian seafarers**, Japan is exploring opportunities to recruit Indian maritime talent to address its **labour shortage**, fostering employment and upskilling in India.

Boosting Maritime Infrastructure:

- Japan's **Imabari Shipbuilding** has proposed a **greenfield shipyard in Andhra Pradesh**, a step forward in advancing **India's domestic shipbuilding capabilities** under the **Maritime India Vision 2030**.

R&D and Next-Gen Maritime Technology:

- Collaboration through **Cochin Shipyard Limited (CSL)** will focus on **next-gen ship design**, **clean fuel vessels**, **automation**, and **technology transfer**, strengthening India's marine innovation ecosystem.

Why This Maritime Agreement Matters:

- **Strategic Security**: Enhances India's maritime leverage in the **Indo-Pacific**, reinforcing freedom of navigation and regional stability.

- **Green Shipping**: Supports India's push toward **carbon-neutral maritime logistics** under the **Maritime Amrit Kaal Vision 2047**.

- **Job Creation**: Taps into India's rich seafaring talent pool—currently constituting **nearly 10% of the global maritime workforce**.

- **Technological Progress**: Facilitates the transfer of **smart, sustainable technologies** to bolster India's shipbuilding and green logistics sectors.

India–Japan Relations: A Multidimensional Partnership

Historical & Cultural Ties:

- Rooted in ancient **Buddhist exchanges** and strengthened by the goodwill of historical figures like **Swami Vivekananda**, **Rabindranath Tagore**, and **Justice Radha Binod Pal**.

- India was among the first nations to sign a **peace treaty with Japan in 1952**, waiving reparation claims and establishing early diplomatic warmth.

Strategic and Security Cooperation:

- Both nations champion a **Free and Open Indo-Pacific (FOIP)** and collaborate under the **Indo-Pacific Oceans Initiative (IPOI)**.

- Active participants in the **Quad** (with the US and Australia) to promote regional security.

- Engage in joint military drills like **JIMEX** (naval) and **Dharma Guardian** (army), and maintain **2+2 ministerial dialogues**.

- Signed the **Acquisition and Cross-Servicing Agreement (ACSA)** and are discussing co-production of defense tech like the **UNICORN mast system**.

Economic Ties:

- Bilateral trade touched **US$ 22.85 billion in FY 2023-24**.

- Japan aims to invest **5 trillion yen (approx. ₹3.2 lakh crore)** in India by **2027**.

- Over **1,400 Japanese companies** operate in India; Japan is the **5th-largest FDI contributor**.

- The **Comprehensive Economic Partnership Agreement (CEPA)**, signed in 2011, facilitates bilateral trade.

Infrastructure & Connectivity:

- Japan is a key partner in transformative projects like the **Mumbai–Ahmedabad Bullet Train**, and metro systems in **Delhi, Chennai, Bengaluru, and Ahmedabad**.

- Plays a major role in **Northeast India's development**, in line with India's **Act East Policy**.

- Promotes **high-quality, sustainable infrastructure** under the **Partnership for Quality Infrastructure** model.

Energy and Technology Synergy:

- **Civil Nuclear Agreement (2017)** enables peaceful nuclear collaboration.

- **Space cooperation** includes the **Lunar Polar Exploration Mission** between **ISRO** and **JAXA**.

- Promotes clean and green Japanese technologies across Indian industries.

People-to-People Engagement:

- Through the **Technical Intern Training Programme (TITP)** and **Specified Skilled Worker (SSW)** schemes, Japan is sourcing **skilled Indian manpower**.

- Cultural and academic exchanges continue to grow, underpinned by shared **Buddhist heritage** and increased youth interaction.

Conclusion: A Future Anchored in Maritime and Strategic Harmony

This deepening maritime partnership reflects the evolving **India–Japan strategic axis**, built on mutual trust, cultural affinity, and shared democratic values. By combining India's growing maritime capacity and Japan's technological prowess, both nations are steering toward a future that ensures **regional peace, sustainable growth**, and **technological leadership in the Indo-Pacific**.

2 **Rising Heatwaves Threaten Labour Productivity and Economic Stability in India**

Context: India is experiencing an alarming rise in **extreme heatwaves**, with **2024 and early 2025** registering record-breaking temperatures and **early onset of heatwave conditions**. These high temperatures are not only a **climate crisis** but also a **labour and economic challenge** for the nation.

Understanding Heatwaves: What Are They?

A **heatwave** is defined as a **period of abnormally high temperatures** relative to a region's climatic norms.

- For **plains**, a heatwave is declared when temperatures reach **40°C or more**.
- For **hilly regions**, the threshold is **30°C or more**.
- The severity increases with **humidity**, **wind conditions**, and **duration** of the heat event.

Economic and Social Impacts of Heatwaves:

Productivity Loss:

- According to the **International Labour Organization (ILO)**, India lost approximately **$100 billion in productivity** due to heat-induced disruptions.
- **Outdoor and informal workers**—such as **farmers, construction workers, delivery personnel**, and **street vendors**—are the worst hit.
- The **World Bank** reports that **75% of India's workforce**—around **380 million people**—are employed in **heat-exposed sectors**.

Agriculture and Food Security:

- **Crop yields decline** dramatically with rising temperatures; for example, **wheat yields reduce by 5.2%** for every **1°C increase**.
- Heat stress affects **livestock productivity**, decreasing milk output and increasing mortality.

Urban Heat Island Effect:

- Cities experience higher nighttime temperatures due to **concrete structures trapping heat**.
- Poor ventilation, lack of green spaces, and overcrowded housing worsen the **urban heat burden**, especially in **Tier-II and Tier-III cities**.

Geographic Vulnerability:

- A **CEEW report** highlights that **57% of Indian districts** face **high heatwave risk**.
- **Delhi, Rajasthan, Tamil Nadu, and Uttar Pradesh** are among the most vulnerable states.

Government Interventions and Gaps:

Policy Measures:

- **Heat Action Plans** have been launched at **city and state levels**, guided by **NDMA protocols**.
- Measures include:
  - **Water kiosks and shaded shelters**
  - **Urban greening initiatives**

- o **Public awareness campaigns**
- o **Early warning systems** (e.g., SMS alerts)

Model Initiatives:

- **Chennai** has pioneered **mapping urban heat islands** to guide climate-resilient urban planning.

Challenges in Rural India:

- Rural areas lack **adequate healthcare**, **cooling infrastructure**, and **heat monitoring systems**.
- Vulnerable populations, especially **daily-wage earners** and **marginal farmers**, are **underprotected**.

What Experts Recommend:

- **Heat Insurance**: Insurance schemes to **protect income** for workers affected by heat-related job disruptions.
- **Compensation Models**: Structured support for **lost wages** during **heat advisories and shutdowns**.
- **Resilient Urban Development**: Long-term investments in **green buildings**, **cool roofs**, **tree cover**, and **sustainable city planning**.
- **Healthcare Readiness**: Strengthening **emergency medical services** in **heat-prone districts**.
- **Data-Driven Heat Risk Mapping**: Real-time data analytics and AI can improve **heatwave forecasting** and **resource allocation.Conclusion: A Call for Urgent and Equitable Climate Action**

The rising frequency and intensity of **heatwaves in India** is a clear indication of the **escalating climate crisis**. Beyond being a health hazard, it is a **major threat to economic productivity**, **food security**, and **social equity**.

To safeguard its workforce and sustain its growth, India must adopt a **comprehensive heat resilience strategy** that blends **short-term emergency response** with **long-term climate-smart planning**. **Inclusive, data-driven, and people-centric solutions** will be key to weathering the heat in the decades ahead.

3 **Aravalli Range: India's Ancient Shield and Ecological Guardian**

Context: The **Central Government** has unveiled an ambitious plan to restore the **ecological integrity** of the **Aravalli mountain range** by developing a **dense green cover** under the **Aravalli Green Wall Project**. This initiative spans nearly **700 km** from **Gujarat to Delhi**, aiming to combat **land degradation**, halt **desertification**, and strengthen **climate resilience** in the region.

Project Aravalli
Jitin Kollamkudy

Aravalli Range: India's Oldest Fold Mountains

The **Aravalli Range**, estimated to be around **670 million years old**, holds the distinction of being the **oldest mountain range in India** and one of the **oldest fold mountains on Earth**. In contrast to the younger **Himalayas**, the Aravallis have stood for **hundreds of millions of years**, shaping the **geological and ecological history** of the Indian subcontinent.

- **Length**: Approximately **692 km** (430 miles), running **northeast** from **Gujarat through Rajasthan and Haryana**, and terminating in **Delhi**.

- **Topography**: Characterised by **rugged hills**, **rocky outcrops**, and **sparse vegetation**.

- **Function**: Acts as a **natural barrier** against the expansion of the **Thar Desert**, plays a pivotal role in **climate moderation**, supports **biodiversity**, and serves as a **watershed** for several rivers.

Geological Formation and Structure:

- Formed during the **Proterozoic Eon**, the Aravallis emerged through **orogenic (mountain-building) processes** caused by **tectonic collisions**.

- Composed primarily of **metamorphic rocks**, especially **granite**, **gneiss**, and **schist**.

- The range is a remnant of a **prehistoric mountain system** that has been heavily **eroded** over time.

- Aravalli rocks have also yielded **marine fossils**, such as **trilobites** and **brachiopods**, indicating the region's ancient **undersea origins**.

Key Ecological and Cultural Highlights:

Peaks and Divisions:

- **Guru Shikhar** in **Mount Abu** is the **highest point** (1,722 meters), named after **Dattatreya**, an incarnation of Vishnu.

- **Dilwara Peak**, also in Mount Abu, is the **second-highest peak** and home to the **Dilwara Jain Temples**, known for their **marble architecture** and historical significance.

- The range is divided into:

  o **Sambhar–Sirohi Ranges**: Higher elevations with peaks like Guru Shikhar.

  o **Sambhar–Khetri Ranges**: Comprising **three discontinuous ridges**.

Water FeaturesS

- Notable **rivers** originating or passing through the Aravallis include:

  o **Sabarmati**

  o **Luni**

  o **Banas** (a tributary of Yamuna)

- Important **lakes**: **Sambhar Lake**, **Nakki Lake**, **Ana Sagar Lake**.
- Scenic **waterfalls**: **Bhimlat**, **Kumbhalgarh**, and **Chitrakoot**.

Biodiversity and Environmental Role:

- Aravallis act as a **green corridor**, connecting **biodiversity hotspots** like the **Western Ghats** and the **Himalayas**.
- The forested areas shelter **leopards**, **jackals**, **hyenas**, and **several bird species**.
- The range is key to controlling **air pollution**, particularly in the **Delhi-NCR** region, by serving as a **windbreak** and **dust filter**.

Mineral Wealth and Economic Significance:

- The Aravalli region is rich in **mineral resources**, including:
  - **Copper**
  - **Zinc**
  - **Lead**
  - **Marble**
- This mineral wealth has historically supported **mining industries**, especially in **Rajasthan**, though unsustainable practices have also contributed to **environmental degradation**.

Conservation Challenges and Restoration Efforts:

- **Illegal mining**, **urbanisation**, and **deforestation** have caused **massive ecological damage**, threatening the region's sustainability.
- The **Aravalli Green Wall** is inspired by Africa's **Great Green Wall Project**, aiming to **revive degraded lands**, enhance **carbon sequestration**, and promote **eco-tourism**.
- Experts suggest integrating **community participation**, **strict enforcement of mining regulations**, and **sustainable livelihood generation** to ensure long-term success.

Conclusion: A Legacy Worth Preserving

The **Aravalli Range** is not just a relic of geological antiquity but a **living ecosystem**, **cultural heritage site**, and a **climate ally** for modern India. Efforts like the **Aravalli Green Wall Initiative** signal a **renewed commitment** to protect this vital natural asset, ensuring it continues to serve **future generations** as a **green shield** in an era of accelerating environmental change.
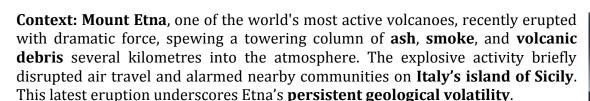
4 | Mount Etna: Europe's Fiery Giant Roars Again

Context: Mount Etna, one of the world's most active volcanoes, recently erupted with dramatic force, spewing a towering column of **ash**, **smoke**, and **volcanic debris** several kilometres into the atmosphere. The explosive activity briefly disrupted air travel and alarmed nearby communities on **Italy's island of Sicily**. This latest eruption underscores Etna's **persistent geological volatility**.

Mount Etna: A Towering Titan of the Mediterranean

- **Location**: Situated on the **eastern coast of Sicily**, **Mount Etna** overlooks the Ionian Sea and dominates the landscape as **Europe's most active volcano**.

- **Elevation**: It stands as the **tallest peak in Italy south of the Alps**, often exceeding **3,300 metres**, though its height changes frequently due to eruptions and ash deposits.

- **Geological Setting**: Etna lies at the junction of the **African and Eurasian tectonic plates**, making it a **hotbed of seismic and volcanic activity**.

Crater System and Eruption Types:

- Etna's **summit** features **five primary craters**, while over **300 secondary vents**—ranging from small fissures to larger cones—dot its **flanks**.

- The recent eruption was of the **Strombolian type**, marked by **moderately explosive bursts** of gas-rich magma. These eruptions hurl **lava fragments**, **cinders**, and **scoria** into the air, often accompanied by **lava fountains** and glowing nighttime displays.

- The term **"Strombolian eruption"** derives from **Mount Stromboli**, another Italian volcano known for its frequent, small-scale blasts.

Historical and Cultural Significance:

- **UNESCO World Heritage Site**: Etna earned this status in **2013** due to its **remarkable geological history** and continuous scientific observation.

- **Eruptive Legacy**: Etna's activity can be traced back nearly **500,000 years**, with **documented records** spanning more than **2,700 years**, making it one of the most studied volcanoes on Earth.

- The volcano has long influenced **mythology and literature**, including ancient Roman beliefs that Etna was the forge of **Vulcan**, the god of fire.

Scientific and Environmental Importance:

- **Natural Laboratory**: Etna provides invaluable data for **volcanology**, **geophysics**, and **climate research**, helping scientists understand the dynamics of magma movement, eruption forecasting, and plate tectonics.

- **Ecosystem Diversity**: The slopes of Etna host **diverse microclimates**, with vineyards, forests, and alpine flora spread across its elevation zones. The surrounding area is protected under the **Etna Regional Park**.

Risks and Preparedness:

- **Hazards**: While most eruptions are not catastrophic, Etna poses risks such as:
  - **Lava flows**
  - **Ashfall**

- o **Earthquakes**
- o **Volcanic gas emissions**
- Nearby cities, including **Catania** and **Messina**, maintain emergency response systems and **real-time volcanic monitoring** to ensure public safety.

Did You Know?

- Etna's ancient name, **"Aetna,"** is believed to derive from the Greek word *"aithō"*, meaning **"I burn."**
- Its fertile volcanic soil supports a thriving **agricultural economy**, including the production of **oranges**, **olives**, **grapes**, and **pistachios**.
- Etna is one of the **Decade Volcanoes**, identified by the **International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI)** as worthy of special study due to its history of **large, destructive eruptions** and proximity to populated areas.

Conclusion: Etna – Nature's Ever-Watchful Furnace

Mount Etna is more than a geological marvel; it is a **living force of nature**, shaping the land, culture, and livelihoods of Sicily. As it continues to rumble and blaze, it reminds us of Earth's dynamic power and the need for **respect, resilience, and preparedness** in the face of natural phenomena.

5 Vietnam Abandons Two-Child Policy Amidst Falling Birth Rates

Context: Vietnam has officially scrapped its longstanding **two-child policy** as the country grapples with a sharp decline in birth rates. Once introduced to curb population growth, the policy is now seen as a hindrance to **economic vitality and workforce sustainability**. The move aligns Vietnam with other Asian nations facing similar demographic challenges such as **South Korea, Japan, and China**.

Vietnam: Geopolitical and Geographical Overview

Political and Geographic Location:

- **Capital**: **Hanoi**

- **Region**: Located on the **Indochina Peninsula** in **Southeast Asia**, Vietnam enjoys strategic significance both on land and at sea.

- **Land Borders**: Shares borders with **China (north)**, **Laos (northwest)**, and **Cambodia (southwest)**.

- **Maritime Boundary**: Faces the **Eastern Sea**, internationally recognized as the **South China Sea**, to its **east**, giving it access to critical maritime trade routes.

Climate and Natural Features:

- **Climate**: Predominantly **tropical**, with **high humidity and temperatures** throughout the year. Seasonal monsoons bring heavy rainfall, influencing agriculture and water supply.

- **Major Rivers**:

  o **Mekong River** (in the south): A lifeline for agriculture and fisheries, especially in the **Mekong Delta**.

  o **Red River** (in the north): Vital for Hanoi and the northern plains.

- **Ha Long Bay–Cat Ba Archipelago**: A stunning seascape of limestone pillars and forested islands, recognized as a **UNESCO World Natural Heritage Site**, and a major tourism draw.

Economic Highlights and Global Standing:

- Vietnam is emerging as a **manufacturing hub in Asia**, benefiting from global supply chain shifts.

- As of **2022**, Vietnam ranked among the **top five producers** of:

  o **Tungsten**

  o **Cement**

  o **Fluorspar**

- It is also a significant exporter of **electronics**, **textiles**, **footwear**, and **agricultural products** such as **coffee and rice**.

- **Foreign investment** has surged, particularly from **Japan, South Korea, and the USA**, driven by Vietnam's stable economic environment and skilled labor force.

Why the Policy Shift Matters:

- Vietnam's **fertility rate** has dipped below **2.1 births per woman**, the replacement level needed to sustain population growth.

- With a **rapidly aging population**, Vietnam faces future shortages in **labor force participation**, straining social security and healthcare systems.

- Scrapping the two-child policy aims to **encourage larger families**, ensuring **economic sustainability** and **generational balance**.

Did You Know?

- Vietnam's **Golden Population Structure**—where the working-age population significantly outnumbers dependents—was expected to be its economic strength. However, **shrinking family sizes** now threaten that advantage.

- The country has begun integrating **AI and automation** into industry to offset labor shortages.

- **Hanoi** and **Ho Chi Minh City** are emerging tech hubs in ASEAN, fostering innovation in **fintech**, **green energy**, and **e-commerce**.

Conclusion: Balancing Growth and Sustainability

As Vietnam enters a new demographic chapter, it seeks to **balance economic growth, social equity, and environmental sustainability**. Removing the two-child cap reflects a strategic pivot—one that prepares the country not only to tackle demographic decline but to **enhance its role as a resilient, forward-looking nation in Asia**.
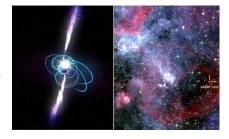
6 A Star with a Secret: Mysterious Celestial Object Emits Radio Waves and X-Rays Every 44 Minute

Context: Astronomers have detected a **rare and puzzling stellar object** in our galaxy that is emitting **both radio waves and X-rays every 44 minutes**—a phenomenon never observed in this combination and rhythm before. This **cosmic oddity**, located about **15,000 light-years away** in the **constellation Scutum**, is being hailed as a potential member of a **newly classified group of celestial bodies** called **long-period radio transients**.

What Makes This Star Special?

Unlike typical **pulsars**, which emit bursts of radio waves within **milliseconds to seconds** due to their ultra-fast spin, **long-period radio transients** release powerful **radio emissions over minutes to hours**, making them **exceptionally slow blinker-stars** in astronomical terms.

This object stands out because it **consistently emits synchronized radio and X-ray pulses**, an extremely rare dual-energy behavior that challenges current astrophysical models.

Location in the Galaxy:

- **Galaxy**: **Milky Way**

- **Distance from Earth**: Approximately **15,000 light-years**

- **Region**: Near the **Scutum constellation**, a star-rich area along the galactic plane

Possible Identities of the Mysterious Object:

Scientists are yet to determine the exact nature of this object, but several **theoretical candidates** have been proposed:

Magnetar:

A **highly magnetized neutron star** that spins slowly but emits intense bursts of energy. Magnetars have the **strongest known magnetic fields** in the universe—**a trillion times stronger than Earth's**.

White Dwarf in a Binary System:

A **white dwarf**, the **remnant core** of a sun-like star, might be in a **binary pair** with a companion star. Interaction between the two could be triggering the unusual emission pattern.

- **Formation of White Dwarfs**: Stars up to **8 times the mass of the Sun** exhaust their fuel, become red giants, shed outer layers, and collapse into a dense, Earth-sized core.

- These stellar remnants, though no longer undergoing fusion, can still **radiate energy** due to gravitational and magnetic interactions.

Powerful Tools Behind the Discovery:

The research team used data from **NASA's Chandra X-ray Observatory**, alongside several **international radio telescopes**, to detect and analyze these synchronized bursts.

- **Radio Waves**: **Low-frequency, long-wavelength** electromagnetic waves often used in **communication systems**.

- **X-Rays**: **High-frequency, short-wavelength** waves capable of penetrating dense material, commonly used in **medical diagnostics** and **astronomy** to observe high-energy phenomena like black holes and neutron stars.

Why It Matters:

This discovery not only **expands our understanding** of exotic stellar remnants but may also help scientists **redefine categories** of celestial bodies. It points to **unknown types of star systems** or **energy emission mechanisms** that have yet to be fully understood.

Did You Know?

- **Long-period radio transients** were first hinted at only recently and remain largely mysterious.

- A single **neutron star** has more mass than the Sun but is only about 20 km in diameter—**so dense that a teaspoon of it would weigh billions of tons**.

- **X-ray astronomy** can peer through clouds of cosmic dust that obscure visible light, offering a clearer view of dense stellar phenomena.

Conclusion: A Signal from the Cosmic Unknown

This **enigmatic star-like object**, blinking across radio and X-ray wavelengths every 44 minutes, opens a new chapter in **high-energy astrophysics**. Whether it turns out to be a **magnetar**, a **white dwarf binary**, or an entirely **new class of stellar remnant**, it reminds us that **the universe still holds many secrets**—and we've only just begun to uncover them.