



1. Accelerating Global Warming

Why in News?

A recent study published in **Geophysical Research Letters** has found that **global warming is accelerating**, with the Earth expected to cross the **1.5°C warming threshold around 2030**, earlier than previously projected.

Key Highlights

- The study shows that the **rate of global warming has increased significantly since 2015**, making the last decade the warmest on record.
- Scientists estimate with **over 98% confidence** that the acceleration is a genuine long-term trend rather than natural climate variability.
- The continued increase in greenhouse gas concentrations remains the primary driver of rising global temperatures.
- **Declining atmospheric aerosol pollution**, which previously reflected part of the incoming solar radiation, has also contributed to faster warming.
- The accelerated warming increases the likelihood of **breaching the 1.5°C global warming limit by around 2030**.

Why is Global Warming Accelerating?

- **Continuous rise in greenhouse gas emissions** from fossil fuel combustion, industry and land-use change.
- **Reduction in cooling aerosols** due to improved air pollution control has reduced their masking effect on global warming.
- **Positive climate feedbacks**, such as melting ice, declining snow cover and increased atmospheric water vapour, further amplify warming.
- Growing frequency of **El Niño events** can temporarily enhance global temperatures.

Major Greenhouse Gases & Their Status (2026)

Greenhouse gases differ in their ability to trap heat (Global Warming Potential - GWP) and their residence time in the atmosphere

Gas	Key Sources (2026 Context)	GWP (100-yr)	Atmospheric Life
Carbon Dioxide (CO ₂)	Fossil fuel combustion (73% of total GHG), cement production, deforestation.	1	100s of years
Methane (CH ₄)	Rice paddies, livestock, leaks from oil/gas infrastructure, landfills.	28-30	~12 years
Nitrous Oxide (N ₂ O)	Nitrogenous fertilizers, industrial processes, biomass burning.	265-273	~121 years
F-Gases (HFCs, SF ₆)	Refrigeration, ACs, electronics manufacturing.	1,000s	Up to 50,000 yrs

IN India's Emissions Profile & Recent Trends

India remains the world's **third-largest emitter**, but its trajectory in 2025–2026 shows a remarkable decoupling of economic growth from carbon output.

- **Growth Deceleration:** In 2025, India's CO₂ emissions grew by only **0.7%**, the slowest rate in two decades (excluding the 2020 pandemic). This is a sharp drop from the 4–11% growth seen in previous years.
- **Renewable Surge:** By late 2025, India's non-fossil fuel installed capacity surpassed **50% (approx. 267 GW)**, significantly curbing the need for coal-fired power despite rising demand.
- **Carbon Credit Trading Scheme (CCTS):** In late 2025 and early 2026, the government notified legally binding **emission intensity targets** for nine energy-intensive sectors (including Cement, Aluminium, and Steel). This covers over 700 million tonnes of CO₂e.

Role of Aerosols

- Aerosols are tiny particles suspended in the atmosphere that can **reflect incoming sunlight**, producing a temporary cooling effect.
- Reduction in sulphate aerosols from cleaner fuels and stricter pollution control improves air quality but also **reduces this cooling influence**, making the underlying greenhouse gas warming more apparent.

- Aerosols have a **short atmospheric lifetime**, whereas greenhouse gases persist for decades to centuries.

Way Forward

- Accelerate the transition towards renewable energy and low-carbon technologies.
- Strengthen implementation of Nationally Determined Contributions (NDCs) under the Paris Agreement.
- Enhance carbon sinks through afforestation, ecosystem restoration and sustainable land management.

UPSC Prelims Practice Question

Q. With reference to global warming, consider the following statements:

1. Atmospheric aerosols generally exert a cooling effect by reflecting incoming solar radiation.
2. Reduction in aerosol pollution can temporarily increase the observed rate of global warming.
3. The Paris Agreement seeks to keep global warming well below **2°C** while pursuing efforts to limit it to **1.5°C** above pre-industrial levels.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Answer: (d)

UPSC Mains Practice Question

Q. *Recent scientific evidence suggests that global warming is accelerating due to both rising greenhouse gas concentrations and declining aerosol pollution. Examine the reasons for this trend and discuss its implications for global climate governance. (15 Marks, 250 Words)*

2.SpaceX Falcon 9 Rocket Stage to Impact the Moon

Why in News?

A discarded **SpaceX Falcon 9 upper stage** is expected to impact the **Einstein Crater** on the Moon, providing scientists with a rare opportunity to study lunar impact processes while drawing attention to the growing challenge of space debris and lunar governance.

Key Highlights

- A **SpaceX Falcon 9 upper stage**, launched in **January 2025**, is projected to collide with the Moon on **5 August 2026**.
- The rocket stage remained in an unstable orbit after completing its mission because it lacked sufficient fuel for controlled disposal.
- Independent astronomer **Bill Gray** tracked the object and predicted its impact trajectory using **Project Pluto**.
- The impact is expected to occur at nearly **8,700 km/hr**, creating a **20–30 metre-wide crater** along with an ejecta plume.
- The impact site lies far from existing or planned lunar landing sites, including **India's Shiv Shakti Point**.

Scientific Significance

- Since the **mass, velocity and trajectory** of the rocket stage are well known, the collision serves as a **controlled impact event**, enabling precise scientific observations.
- Scientists can study:
 - Formation of fresh lunar craters.
 - Behaviour and dispersal of lunar dust (regolith).
 - Mechanical properties of the lunar surface.
 - Seismic response of the Moon to impact events.
- The event is comparable to NASA's **LCROSS Mission (2009)**, which intentionally crashed a spacecraft into the Moon to detect water ice.

Space Debris: An Emerging Challenge

Space debris, or "orbital debris," refers to non-functional, man-made objects in Earth's orbit. As of **August 2026**, the situation has reached a critical juncture due to the rapid deployment of mega-constellations.

- **By the Numbers:** There are over **36,000 tracked objects** larger than 10 cm and an estimated **130 million fragments** smaller than 1 cm.

- **Mass in Orbit:** The total mass of all space objects exceeds **17,000 tonnes**, with approximately one metric tonne of unguided debris re-entering the atmosphere every week.
- **The Kessler Syndrome:** This is the theoretical "tipping point" where the density of objects in Low Earth Orbit (LEO) is high enough that collisions cause a self-sustaining cascade of more debris. Recent data from **ISSAR-2025** (Indian Space Situational Assessment Report) suggests that even with zero new launches, fragmentation of existing objects would continue to increase debris levels.

★ Key Fact

Project NETRA (Network for space object Tracking and Analysis) is India's early warning system to protect satellites from debris, with nearly ₹68 crore invested as of 2026.

India's Initiatives for Space Sustainability

- **Project NETRA (Network for Space Object Tracking and Analysis):** India's Space Situational Awareness (SSA) programme for tracking space debris and protecting satellites.
- **IS4OM (ISRO System for Safe & Sustainable Space Operations Management):** Monitors orbital objects and coordinates collision avoidance measures.
- **Debris Free Space Mission (DFSM-2030):** ISRO's initiative to ensure all future Indian missions adopt debris mitigation and responsible disposal practices.
- **SpaDeX (Space Docking Experiment):** Demonstrates autonomous docking technologies essential for future active debris removal missions.



Legal and Governance Issues

- The **Outer Space Treaty, 1967** prohibits national appropriation of the Moon but does not provide detailed rules for protecting scientifically significant lunar sites.
- There is **no comprehensive international legal framework** regulating accidental impacts or preservation of lunar heritage locations.
- The **UN Action Team on Lunar Activities Consultation (ATLAC)** is working towards developing international norms for responsible lunar exploration and debris management.

Significance

- Highlights the need for **responsible end-of-mission disposal** of spacecraft and rocket stages.
- Reinforces the importance of **Space Situational Awareness (SSA)** and debris tracking.
- Underlines emerging challenges in **space governance** as lunar exploration accelerates.
- Demonstrates the growing importance of international cooperation for the sustainable use of outer space.

Way Forward

- Strengthen global norms on end-of-life disposal of spacecraft and upper stages.
- Develop legally binding international guidelines for lunar activities and heritage site protection.

- Expand global Space Situational Awareness networks and data sharing.
- Promote active debris removal technologies and sustainable mission design.

UPSC Prelims Practice Question

Q. With reference to **space debris**, consider the following statements:

1. Space debris includes non-functional satellites and spent rocket stages remaining in orbit.
2. Project NETRA is India's initiative for tracking space objects and providing collision warnings.
3. The Outer Space Treaty, 1967 provides detailed legal protection for scientifically significant lunar sites.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Answer: (a)

UPSC Mains Practice Question

Q. *Growing space exploration has intensified concerns regarding space debris and the governance of lunar activities. Discuss the challenges posed by space debris and examine the need for an international regulatory framework to ensure the sustainable use of outer space. (15 Marks, 250 Words)*

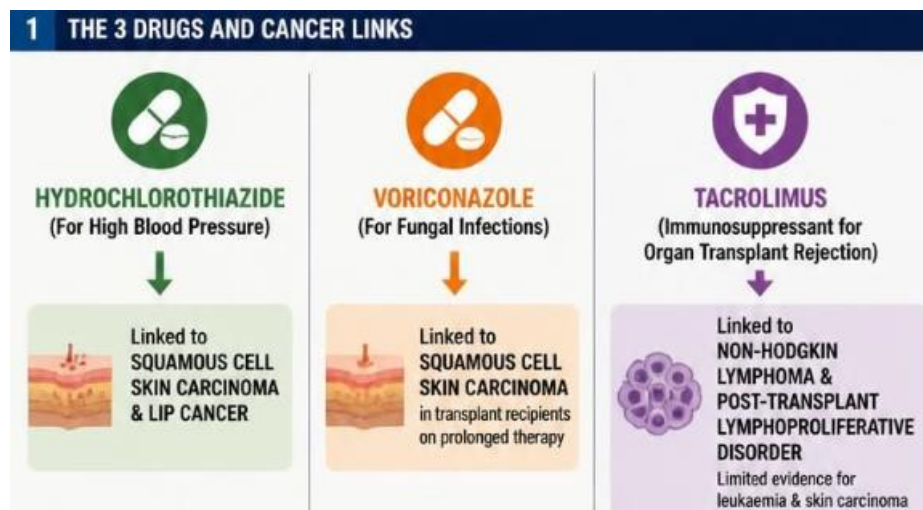
3.3 widely used medicines classified as carcinogenic by WHO research agency

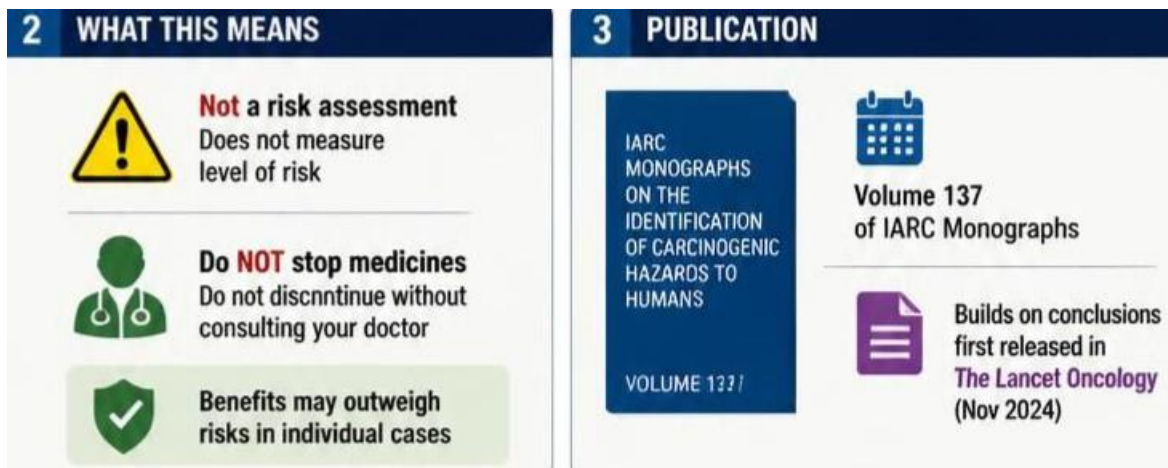
Why in news?

WHO's IARC classifies three widely used essential medicines, including hypertension and transplant drugs, as carcinogenic to humans, raising global health concerns.

Key Highlights:

- The **International Agency for Research on Cancer (IARC)**, a **World Health Organization (WHO)** research agency, has classified three widely used medicines as "**carcinogenic to humans**" (**Group 1**).
- The medicines are **hydrochlorothiazide** (for high blood pressure), **voriconazole** (for fungal infections), and **tacrolimus** (an immunosuppressant for organ transplant rejection).
- These three drugs are included in the **WHO Model List of Essential Medicines**, indicating their widespread use globally.
- **Hydrochlorothiazide** is linked to **squamous cell skin carcinoma** and lip cancer.
- **Voriconazole** is associated with **squamous cell skin carcinoma** in transplant recipients on prolonged therapy.
- **Tacrolimus** is linked to **non-Hodgkin lymphoma** and **post-transplant lymphoproliferative disorder**, with limited evidence for leukaemia and skin carcinoma.





Detailed Insights:

- The **IARC** classification is a hazard identification, meaning it indicates the potential to cause cancer, but does not assess the level of risk based on exposure.
- Medical experts advise patients not to discontinue these treatments without consulting their doctors, as the benefits may outweigh the risks for individual cases.
- The assessment was published as Volume 137 of the **IARC Monographs**, building upon conclusions initially released in The Lancet Oncology in November 2024.
- In India, concerns exist regarding the irrational prescribing, over-the-counter availability, and poor adherence to ethical prescribing practices for such medications.
- **Hydrochlorothiazide** has long been recognized for its risk, particularly in sun-exposed populations and outdoor workers.
- **Voriconazole** is also a concern due to its known association with skin cancer risk and its frequent prescription for off-label indications.

4.Registration of Births and Deaths (Amendment) Bill, 2026

Why in News?

Parliament has passed the **Registration of Births and Deaths (Amendment) Bill, 2026**, introducing stricter provisions for delayed registration of births and deaths to improve the integrity of the Civil Registration System (CRS).

Key Highlights

- The Bill amends **Section 13(3)** of the **Registration of Births and Deaths Act, 1969**.
- Registration of births or deaths **after two years** will now require an order from a **Judicial Magistrate First Class (JMFC)**.
- Registrations delayed between **one and two years** will continue to require approval from an **Executive Magistrate**.
- The amendment aims to encourage timely registration and strengthen verification of long-delayed cases.
- It complements the **2023 amendment**, which made the birth certificate the primary proof for several official documents and services.

Registration of Births and Deaths Act, 1969

- Enacted to provide **compulsory and uniform registration** of births and deaths across India.
- Forms the legal basis for the **Civil Registration System (CRS)**.
- Implemented by State Governments through local registrars, while the **Registrar General of India (RGI)** coordinates the system at the national level.
- Provides reliable **vital statistics** for demographic planning, public health and governance.

Major Provisions of the 2026 Amendment

- **Delay up to 1 year:** Registration continues under the existing procedure prescribed under the Act.
- **Delay between 1–2 years:** Registration requires approval from the **District Magistrate, Sub-Divisional Magistrate or other authorised Executive Magistrate**.
- **Delay beyond 2 years:** Registration can be made only with the approval of a **Judicial Magistrate First Class (JMFC)**, introducing judicial scrutiny for long-pending cases.

★ Key Fact

The Bill amends Section 13(3) of the Registration of Births and Deaths Act, 1969, shifting the authority for delays over 2 years from the Executive to the Judiciary.

Why was the Amendment Needed?

- The **2023 amendment** significantly enhanced the legal importance of birth certificates by making them a primary document for:
 - Aadhaar
 - Passport
 - Electoral rolls
 - Educational admissions
 - Government recruitment
 - Other notified services
- Increased reliance on birth certificates also increased the risk of **fraudulent delayed registrations**.
- The amendment seeks to strengthen verification while maintaining the credibility of official records.

Significance

- Improves the reliability and accuracy of the **Civil Registration System**.
- Reduces the possibility of identity fraud through fabricated birth or death records.
- Strengthens demographic databases used for planning health, education and welfare programmes.
- Facilitates timely updating of government databases, including removal of deceased persons from electoral rolls.
- Enhances evidence-based policymaking through accurate vital statistics.

Way Forward

- Increase public awareness regarding mandatory registration within the prescribed time.
- Strengthen digital integration of the Civil Registration System with health institutions and local governments.
- Improve registration infrastructure and capacity at the grassroots level.
- Ensure speedy disposal of genuine delayed registration cases while maintaining safeguards against fraud.

UPSC Prelims Practice Question

Q. With reference to the **Registration of Births and Deaths (Amendment) Bill, 2026**, consider the following statements:

1. Registration of births or deaths delayed by more than two years requires approval from a Judicial Magistrate First Class.
2. The amendment modifies the Registration of Births and Deaths Act, 1969.
3. The Civil Registration System (CRS) is coordinated nationally by the Registrar General of India.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Answer: (d)

UPSC Mains Practice Question

Q. *The Civil Registration System is fundamental for effective governance and delivery of public services. Discuss the significance of the Registration of Births and Deaths (Amendment) Bill, 2026 in strengthening India's civil registration framework while ensuring the authenticity of vital records. (15 Marks, 250 Words)*

5. 10-km mining buffer applies to all wetland reserves: SC

Why in News?

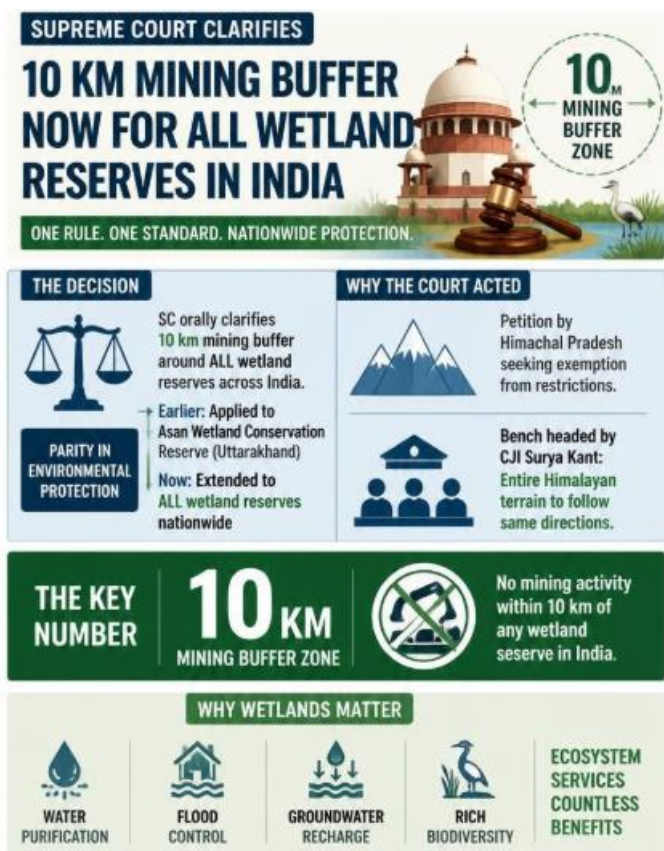
Supreme Court mandates 10-km mining buffer zone for all wetland conservation reserves nationwide, citing environmental parity and protection.

Key Highlights:

- The Supreme Court orally clarified that a 10-km mining buffer zone, initially applied to the **Asan wetland conservation reserve** in Uttarakhand, will now extend to all wetland reserves across India.
- This decision was made to ensure parity in environmental protection for wetlands nationwide.
- The ruling came during a hearing on a petition filed by Himachal Pradesh, which sought exemption from such restrictions.
- The Bench, headed by Chief Justice of India **Surya Kant**, emphasized that the entire Himalayan terrain should be governed by the same set of directions.

Detailed Insights:

- The **Asan wetland conservation reserve** is a designated **Ramsar site**, highlighting its international ecological importance.
- The Supreme Court's decision aims to provide uniform protection to these crucial ecosystems, preventing localized degradation.
- Wetlands are vital for numerous ecosystem services, including water purification, flood control, groundwater recharge, and supporting rich biodiversity.
- India is a signatory to the **Ramsar Convention**, an intergovernmental treaty for the conservation and wise use of wetlands.
- The **Wetlands (Conservation and Management) Rules, 2017**, notified under the **Environment (Protection) Act, 1986**, provide a regulatory framework for wetland conservation in India.
- These rules prohibit activities like land reclamation, setting up new industries, and dumping of solid or hazardous waste within notified wetland boundaries.



- The ruling underscores the judiciary's role in enforcing environmental regulations and ensuring consistent application of protective measures across states.

