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DAILY CURRENT AFFAIRS

The Hindu & The Indian express

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1

Which one of the following Schedules of the Constitution of India contains provisions regarding anti-defection?

(a) Second Schedule

(b) Fifth Schedule

(c) Eighth Schedule

(d) Tenth Schedule

2 With reference to anti-defection law in India, consider the following statements :

1. The law specifies that a nominated legislator cannot join any political party within six months of being appointed to the House.

2. The law does not provide any time-frame within which the presiding officer has to decide a defection case.

Which of the statements given above is/are correct ?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

HC disqualifies Mukul Roy from Bengal Assembly

Moyurie Som
KOLKATA

The Calcutta High Court on Thursday disqualified senior leader Mukul Roy from the West Bengal Assembly under the anti-defection law for switching over to the Trinamool Congress (TMC) after being elected on a Bharatiya Janata Party (BJP) ticket on June 11, 2021. The order overturns an earlier decision of the Assembly Speaker, who had set aside a plea by the Leader of Opposition, Suvendu Adhikari, seeking Mr. Roy's disqualification.

Since the TMC came to power in West Bengal in 2011, nearly 50 MLAs from Opposition parties, including the Communist Party of India (Marxist), the Congress, and more recently, the BJP, joined the ruling party and have continued to participate in Assembly proceedings.

ANTI-DEFECTION LAW – PRELIMS Revision

10th Schedule Basics

- **Added by: 52nd Constitutional Amendment Act, 1985**
- **Purpose: Prevent political defections; ensure stability of governments.**
- **Applies to: Parliament + State Legislatures.**

Grounds for Disqualification

1. Voluntarily giving up membership of party

2. Voting / abstaining against party whip without prior permission.

3. For Independent members:

- **Joining any political party; disqualified.**

4. For Nominated members:

- **If they join a party after 6 months of nomination $\rightarrow$ disqualified.**

Exceptions (No Disqualification)

- **Merger provision:**
  - **If 2/3rd of legislators of a party merge with another; no disqualification.**
- **Presiding Officer (Speaker/Chairman) voluntarily gives up party on election to office; no disqualification.**

Authority for Decision

- **Speaker / Chairman of the House decides disqualification petitions.**
- **Acts in quasi-judicial capacity.**

Judicial Review – Prelims Points

- **Kihoto Hollohan (1992):**
  - **Speaker's decision subject to judicial review.**

How interactions between solar storms and Earth light up the sky

SOLAR STORMS brought colourful auroras to unexpected places this week in many parts of the Northern Hemisphere.

Aurora displays, known as the northern and southern lights, are commonly visible near the poles, where charged particles from the Sun interact with Earth's atmosphere. The auroras' brightness and visibility depend on when the burst gets here and how it interacts with Earth's atmosphere.

Over the past few days, the Sun has burped out several bursts of energy called coronal mass ejections. The Sun is currently at the maximum phase of its 11-year activity cycle, making the light displays more widespread. Every 11 years, its magnetic poles swap places.

{ SPACE }

Last year, a powerful solar storm dazzled skygazers far from the Arctic Circle when dancing lights appeared in unexpected places. The Sun's active spurt is expected to last at least through the end of this year.

Northern lights over St Mary's Lighthouse in England Wednesday. AP

However, the phenomenon can also temporarily disrupt the power grid and impact air traffic control, radio and satellites in orbit. In 1859, a severe solar storm triggered auroras as far south as Hawaii and set telegraph lines on fire in a rare event. AP

SOLAR STORMS & AURORAS- Prelims

1. Solar Storms

- Disturbances from Sun's surface/atmosphere.
- Caused by solar flares + CMEs.
- Eject charged particles + magnetic fields toward Earth.

2. Coronal Mass Ejection (CME)

- Huge burst of plasma + magnetic field from corona.
- Travels at hundreds-thousands km/s.
- Hits magnetosphere $\rightarrow$ auroras + geomagnetic storms.

3. Auroras

- Solar particles collide with gases in thermosphere.
- Aurora Borealis (North), Australis (South).
- Seen near poles due to magnetic field funneling.

4. Auroras in Unusual Places

- Result of strong CMEs during 11-year solar maximum.
- Push auroras to lower latitudes (Europe, U.S., etc.).

If a major solar storm (solar flare) reaches the Earth, which of the following are the possible effects on the Earth ?

1. GPS and navigation systems could fail.
2. Tsunamis could occur at equatorial regions.
3. Power grids could be damaged.
4. Intense auroras could occur over much of the Earth.
5. Forest fires could take place over much of the planet.
6. Orbits of the satellites could be disturbed.
7. Shortwave radio communication of the aircraft flying over polar regions could be interrupted.

Select the correct answer using the code given below :

(a) 1, 2, 4 and 5 only

(b) 2, 3, 5, 6 and 7 only

(c) 1, 3, 4, 6 and 7 only

(d) 1, 2, 3, 4, 5, 6 and 7

The Tamil Nadu model of sub-State climate action

Supriya Sahu

is Additional Chief Secretary, Environment, Climate Change and Forests Department, Government of Tamil Nadu

Srinivas Krishnaswamy

is CEO, Vasudha Foundation

Tamil Nadu's approach to climate action and biodiversity conservation is anchored in the belief that effective leadership begins on the ground, where policies are implemented, communities participate and results can be measured. To translate this principle into practice, the State created one of India's first dedicated agencies to coordinate and track all climate-related work, i.e., the Tamil Nadu Green Climate Company (TNGCC). Through its four key missions – the The Tamil Nadu Climate Change Mission (TNCCM), The Green Tamil Nadu Mission (GTNM), The Tamil Nadu Wetlands Mission (TNWM) and The Tamil Nadu Coastal Restoration Mission (TN SHORE) – the TNGCC drives emission reduction, ecosystem restoration and livelihood resilience.

A net zero pathway, pilot districts

With the aim to make Tamil Nadu Net Zero well before 2070, the State has released a detailed Greenhouse Gas (GHG) Inventory covering annual emissions across all sectors and sub-sectors, from 2005 to 2019, and developed a detailed Net Zero Pathway.

Findings from the State's GHG inventory reveal encouraging trends. Despite being one of India's most industrialised States, Tamil Nadu contributed only 7% of the country's total emissions in 2019. Moreover, between 2005 and 2019, it reduced its emission intensity to GDP by nearly 60%.

This progress reflects targeted interventions across key sectors: rapid expansion of renewable energy, improved energy efficiency, industrial decarbonisation and an ambitious electric-mobility programme that aims to electrify all public transport. Today, renewable energy accounts for about 60% of Tamil Nadu's total installed power capacity and 30% of total electricity generated.

In order to meet its goal of being net zero well before 2070, the State has also embarked on a bottom-up climate action planning and implementation. The State has recently launched district-level decarbonisation plans and a real-time Climate Action Tracker developed in collaboration with the Vasudha Foundation, embedding climate action directly into local governance. The decarbonisation plans for four pilot districts – The Nilgiris, Coimbatore, Ramanathapuram and Virudhunagar – show that these districts can abate up to 92% of projected emissions (of the four districts) by 2050 through clean energy adoption, mobility transformation, industrial efficiency and nature-based solutions. They also have the potential to sequester nearly three million tonnes of carbon dioxide equivalent by 2050.

In the State's 'bottom-up' approach, district-level decarbonisation plans and a real-time tracker are helping shape climate actions at the local and sub-local levels

The Climate Action Plans and decarbonisation pathways for the four districts build on a detailed district-level greenhouse gas emissions inventories along with a detailed climate variability assessment based on historic and current climate data and projecting the assessments till end of the century. What came across consistently is that if greenhouse gases are left unabated not just in the four districts but across India and globally, the number of warm days would increase significantly by about 95% by 2100, with a substantial increase in precipitation levels, leading to a wetter monsoon, impacting the region, particularly the vulnerable Nilgiris district.

Responsible factors

Road transport is a major contributor to the GHG emissions in the Nilgiris and Coimbatore districts (close to 43% and 36% of the total emissions, respectively), followed closely by residential energy consumption (20% and 12%). Cement, road transport and industrial energy were the highest GHG contributors in Virudhunagar (37%, 20% and 16%, respectively). In Ramanathapuram, public electricity generation and rice cultivation (28% and 12%, respectively) were the contributors.

Building on the emissions trajectories and identifying the key driver of emissions, the action plans propose a shovel ready list of projects to be implemented each year, from 2025, covering electric mobility, waste management, forest restorations and industrial decarbonisation – all tailor-made for each district. When implemented, the Nilgiris district can become net zero by 2030 even in a moderate scenario. Ramanathapuram can become net zero by 2047 in an aggressive scenario which will mean lifestyle changes to some extent. However, due to a high level of industrialisation, Coimbatore and Virudhunagar can become net zero by about 2055.

The approach views climate change not as a constraint but as an opportunity to pursue growth that safeguards both nature and people. Similar plans will soon be developed for all the 38 districts in Tamil Nadu.

The Climate Action Tracker is designed around a simple premise: what gets measured, gets done. Together, they create a transparent, evidence-based system for planning and accountability, ensuring that every district can monitor its progress and refine its strategies. To support effective implementation, a dedicated Project Management Unit is being established in the four pilot districts. The action tracker and the action plans can be accessed at https://tnclimatetracker.tn.gov.in

Other schemes, community focus

Other key initiatives of Tamil Nadu include large-scale afforestation, mangroves, wetland restoration and biodiversity protection. The State now hosts 20 Ramsar-designated wetlands, and has ensured that 30% of its total land area is protected. Along Tamil Nadu's 1,068-kilometre coastline, massive efforts are being undertaken in restoring mangroves and seascapes while supporting coastal livelihoods.

By expanding the focus beyond energy and industry to include agriculture, livestock and waste, Tamil Nadu is broadening the scope of its low-carbon transition.

Communities are being placed at the centre of this transformation, turning climate action into a participatory process. The choices made today at the local and sub-local levels will shape the future of the State's economy, ecosystems, and communities. Tamil Nadu's experience underscores the point that climate leadership is no longer about setting ambitious targets but about building systems that make progress visible, verifiable and participatory.

As India advances toward its net-zero future, Tamil Nadu's model offers a valuable complement by showing how national intent can be deepened through local innovation and evidence-led governance.

Mains Enrichment

Central Argument

Tamil Nadu shows that decentralised, district-level climate action — backed by real-time tracking, clear GHG inventories, and community participation — is the most effective model for climate mitigation, adaptation, and Net Zero planning in India.

Imporantant for Mains

- **Tamil Nadu created an integrated climate governance system (TNGCC + 4 climate missions)**
- **Uses district-level GHG inventories (2005–2019) and Net Zero Pathway with detailed sector targets.**
- **Districts have decarbonisation plans with projected emission cuts up to 92% by 2050.**
- **Real-time Climate Action Tracker ensures transparency and measurable outcomes.**
- **Strong focus on: renewable energy, mobility transition, industrial efficiency, wetland & mangrove restoration, biodiversity.**
- **60% of its installed power capacity from renewables; emission intensity reduced 60% (2005–2019).**
- **Community participation central: agriculture, livestock, waste management integrated with climate action.**
- **Serves as a replicable blueprint for other Indian States.**

ABSTRACT

Holding up GLASS to India; securing stewardship to tackle AMR

Antimicrobial resistance in India is a 'serious and escalating threat', with resistance rates among the highest in the world; comprehensive action is needed, including surveillance, rational antibiotic use, public awareness, and sustained funding to reduce AMR and protect community health

Ramya Kannan

Around mid-October 2025, when the World Health Organisation (WHO) released its Global antibiotic resistance surveillance report 2025 (GLASS), there was hardly any surprise in the quarters in which antimicrobial resistance usually gets a rise. No one was surprised that antimicrobial resistance (AMR) in India "is a serious and escalating threat, with resistance rates among the highest in the world."

The report, which draws on data from over 100 countries, noted: In 2023, approximately one in three bacterial infections in India were resistant to commonly used antibiotics, mirroring severe trends across South-East Asia. Globally, the report said, one in six confirmed infections were resistant, with India disproportionately affected due to factors including high infectious disease burden, overuse and misuse of antibiotics, and gaps in surveillance and healthcare infrastructure.

For India, the report underlined the following aspects: High resistance rates to major antibiotics, especially in serious infections such as those caused by E.coli, Klebsiella pneumoniae, and Staphylococcus aureus, particularly in hospital ICUs; the challenging factors that aggravate AMR are widespread over-the-counter antibiotic access, self-medication, incomplete courses, environmental contamination (from pharmaceutical manufacturing and hospital waste), and uneven enforcement of regulations.

The report also provided a hat tip to national initiatives such as the National Programme on AMR Containment and the growing lab network in India, in trying to stem the tide, but concluded that several significant issues remain to be addressed, including insufficient funding and limited coordination between human, animal, and environmental health.

While India participates actively in GLASS, most surveillance data comes from tertiary hospitals, not fully representing the community or rural areas. Notably, India enrolled in the WHO's GLASS in 2017.

GETTY IMAGES

Incomplete data

Abdul Ghafur, senior consultant, infectious diseases, says: "The AMR levels in India are among the highest globally, particularly for gram-negative pathogens. This is entirely consistent with the national surveillance data from ICMR's AMRSN / i-AMRSS and NCDC's NARS-Net." These are two complementary surveillance networks for AMR in India.

Dr. Ghafur says, these datasets have a fundamental limitation in that they largely originate from top tertiary care hospitals (medical colleges or referral centres) where severe, complicated infections and high antibiotic pressure are common. "This does not incorporate bacterial susceptibility data from the vast network of secondary or primary care hospitals, which see very different patient populations, antibiotic usage patterns, and microbiological ecologies. The result is that the national "resistance rates" we cite are likely a biased overestimate of the country-wide average – reflecting the more extreme end of the spectrum rather than the full distribution of resistance." V. Ramasubramanian, senior infectious diseases specialist, also touches upon the issue of inconsistent representation. "This is a vast nation with huge diversity, we need to have [AMR surveillance] centres spread across the country. Unless we correctly interpret susceptibility patterns, we may be drawing erroneous conclusions."

The WHO too urges for more complete nationwide surveillance, rational antibiotic use, and stronger regulation, warning that without urgent improvements, routine infections in India may increasingly become untreatable, leading to higher mortality and pressure on the healthcare system.

Kerala model

A key factor for the worsening situation is attributed to snail's pace progress on implementation of India's National Action Plan on Antimicrobial Resistance (NAP-AMR). "While the national framework set a strong vision in 2017, only a few States have formally launched or operationalised their State Action Plans on AMR; even among these, most remain in the very early stages of execution," Dr. Ghafur explains.

Apart from Kerala, no other State has done anything significant in terms of AMR, adds Dr. Ramasubramanian. The Kerala Antimicrobial Resistance Strategic Action Plan was rolled out in 2018 and took the path of inter-sectoral collaborations and One Health to handle AMR. The State went on to launch "AMRITH" (Antimicrobial Resistance Intervention for Total Health) in January 2024 to stop the over-the-counter (OTC) sale of antibiotics. In the latest antibiogram released by the State government, a slight dip has been noticed in AMR levels.

AMR literacy

Kerala also aims to become antibiotic-literate by December 2025 through awareness programmes and proper antibiotic use initiatives. Yewande Alimi, One Health Unit Lead, Africa CDC, says the key now is for the world to have a basic understanding of the role of bacteria. "We need to spread information very early about the importance of the bacterial world in our life," she said during a recent webinar on Antimicrobial Resistance – A Global Health Security Crisis organised by the AIDS Healthcare Foundation (AHF), in collaboration with the University of Miami Public Health Policy Lab.

Ella Balasa, patient advocate and consultant, also fleshed out the same theme. "Awareness is really valuable. I would suggest we bring together large non profit groups, bring a face to the crisis and problem. That is the way by which we can get the general population to relate to the issue more easily. That is currently where we have the disconnect: AMR to the general population is abstract. We must humanise it, and bring it into their lives, that's how we are going to bring solutions."

Colistin ban

One significant intervention that has benefitted the country is the 2019 ban on colistin – being widely used as a growth agent in animal husbandry in India until then. Dr. Ramasubramanian says: "Intuitively, we know it will help, but quantification of how much it has helped will only be possible after long-term studies". Simply and consistently implementing State and national policies on AMR will go a long way in ameliorating the situation, he adds.

There is little doubt that but for pockets of progress, India's antibiotics stewardship is all but flailing and needs resuscitation. The thing is we do know what to do, experts say. For a first, it is essential to bring in more centres reporting resistance, Dr. Ghafur insists: "To obtain truly representative national estimates, India must adopt a full-network model: draw in the 500+ NABL labs that already exist, and invest in building microbiology capacity in peripheral and primary care tiers."

Newer antibiotics

Tackling the problem from the other side would be to develop newer antibiotic models. Vasan Sambandamurthy, Senior Vice President at Bugworks Research Inc, a clinical stage biopharmaceutical company that is developing novel class of broad-spectrum antibacterial agents and immunotherapies, points out that several antibiotics have been launched in the last two years. In India, the approval of the CDSCO has been granted to four new antibiotic candidates while six other candidates have received approval for use globally.

He adds: "What is encouraging is that the 2024 WHO report on the antibiotic development pipeline shows a modest increase in antibacterial agents, with 97 candidates in clinical and preclinical stages in 2023 versus just 80 in 2021. Unfortunately, the pipeline remains thin in terms of truly innovative antibiotics. Only 12 of the 32 traditional antibiotics in development meet WHO innovation criteria (new class, new mode of action, no cross-resistance), and just four target WHO's highest priority critical pathogens, particularly MDR Gram-negative bacteria."

Dr. Sambandamurthy says the availability of newer antibiotics in India does have the potential to significantly alter the AMR landscape. But, despite this sliver of hope, the current clinical pipeline and recently-approved antibiotics are insufficient to tackle the global AMR challenge given the significant gaps in their spectrum, and availability across Low and Middle Income Countries (LMIC).

He says "new antibiotics should possess novel mechanisms of action or belong to new classes that bypass existing resistance pathways. They must target WHO's highest priority MDR pathogens, including carbapenem-resistant Enterobacterales and Acinetobacter baumannii. In addition, demonstrating broad efficacy against MDR strains, offering both oral and intravenous formulations, and having a strong safety profile are essential. Furthermore, these antibiotics should suppress further resistance development, be accessible and affordable globally, especially in LMICs, and align with antimicrobial stewardship principles."

Global efforts and funding

It's important to understand the role of the AMR Industry Alliance in countering AMR globally. Dr. Sambandamurthy who sits on the board of this alliance says the organisation aims at accelerating discovery and development of new antibiotics and diagnostic tools and strengthening equitable access to antibiotics, especially in LMICs, and implementing responsible antibiotic manufacturing standards.

Ultimately, funding shortages need to be tackled head on, Dr. Ghafur stresses: "Beyond the modest surveillance funding and a few innovation grants, there has been very little sustained financial or policy investment. Industry engagement, public awareness, and innovation funding are sporadic and small in scale." This needs to change.

Just around the corner, this year's World AMR Awareness Week (18-24 November) urges the world to "Act Now: Protect Our Present, Secure Our Future." For India, it means embracing the staggering breadth of the problem and employing multi-pronged strategies that will improve its stewardship, resulting in reducing the rates of AMR in the community. If one State has managed to do that, then it is proof that what seems like a tide can indeed be stemmed.

Central Argument

India has one of the worst AMR burdens, and GLASS 2025 shows India must urgently strengthen surveillance, stewardship, regulation, awareness, and funding to prevent AMR from becoming a full public-health crisis.

Antimicrobial Resistance

- Microbes evolve to resist antimicrobials (antibiotics, antivirals, antifungals).
- Infections become harder to treat; need last-line drugs.

Key Points

1. India's AMR Situation

- 1/3 infections resistant to common antibiotics.
- High resistance: E. coli, Klebsiella, Staph, esp. ICUs.
- Causes: overuse, incomplete treatment, OTC antibiotics, poor infection control, contamination, weak regulation.

2. What India Needs

- A. Surveillance – Expand AMRSN/ICMR; better susceptibility data.
- B. Stewardship – Rational use; restrict OTC sale.
- C. Awareness – Make AMR relatable to public.
- D. Regulation – Curb misuse in hospitals, farms, poultry, aquaculture.
- E. Innovation – Very few new antibiotics; weak pipeline for MDR bugs. F. Funding – Long-term investment in labs, R&D, data systems.

3. Kerala Model

- Strong State AMR plan, political backing, surveillance + stewardship; model for India

Centre releases draft Seeds Bill; farm outfits cautious, industry welcomes it

A.M. Jigeesh
NEW DELHI

After two failed attempts by both the UPA and NDA governments in 2004 and 2019 to pass a similar law, the Union government has brought yet another draft Seeds Bill here on Thursday.

The Union Agriculture Ministry said the new draft is aligned with current agricultural and regulatory requirements. The proposed legislation is intended to replace the existing Seeds Act, 1966 and the Seeds (Control) Order, 1983.

While the seed industry welcomed the move, farmer organisations reminded the Centre that it had to withdraw the Bill on two occasions following their resistance.

The draft Bill seeks to ensure farmers' access to high-quality seeds, the Centre said.

The Centre said in a release that the draft Seeds Bill, 2025 seeks to regulate the quality of seeds and planting materials available in the market, ensure farmers' access to high-quality seeds at affordable rates, protect farmers from losses, and liberalise seed imports to promote access to global varieties. "On the enforcement side, the draft Bill proposes to decriminalise minor offences, thereby promoting 'Ease of Doing Business' and reducing compliance burden, while maintaining strong provisions to penalise serious violations effectively," the government said.

All stakeholders and members of the public can submit their comments and suggestions on the draft Bill and its provisions by December 11.

As per the draft, every dealer in seeds shall obtain a registration certificate from the State government before selling, keeping for sale, offering to sell, import or export or otherwise supply any seed by himself or by another person on his behalf. The draft law also provides for regulation of sale of seeds so that seed varieties conform to the minimum limit of germination, genetic purity, physical purity, traits, seed health and other seed standards specified in the 'Indian Minimum Seed Certification Standards'.

Speaking to *The Hindu*, senior functionary of Bhartiya Kisan Union (Ekta Ugrahan) Pavel Kussa said: "...On the face of it, this Bill favours seed companies and facilitates ease of doing seeds business. We will study the draft Bill and make our position known to the government and the public."

Federation of Seed Industry of India chairman Ajai Rana said the release of the draft is a timely step toward modernising India's seed regulatory framework.

India has one of the worst AMR burdens, and GLASS 2025 shows India must urgently strengthen surveillance, stewardship, regulation, awareness, and funding to prevent AMR from becoming a full public-health crisis.

Key points

- **Ensures high-quality seeds -better germination, purity, health; protects farmers from poor seeds.**
- **Affordable and diverse options; liberalised seed imports, access to global varieties.**
- **Mandatory registration for anyone selling, storing, exporting, or offering seeds; strict record-keeping.**
- **Seeds must conform to Indian Minimum Seed Certification Standards.**
- **Decriminalises minor offences -reduces compliance burden, improves Ease of Doing Business.**
- **Strong penalties remain for serious violations to ensure seed quality.**
- **Replaces Seeds Act, 1966 & Seeds (Control) Order, 1983 -updated regulatory framework.**

India's carbon emission rise slower this year, says report

In 2024, the country's emissions grew by 4%, but a favourable monsoon, which cut demand for cooling, and a growth in renewable energy use, limited the rise to 1.4%, says Global Carbon Project

Jacob Koshy
NEW DELHI

India's 2025 carbon emissions have increased slowly compared to last year. While global carbon emissions are expected to rise to 38 billion tonnes, or by 1.1%, this year, the growth in India's emissions is expected to increase by 1.4%, according to the Global Carbon Project, an authoritative tracker of fossil fuel emissions. This is lower than in recent years – in 2024, India's emissions grew 4% than the previous year.

The slower increase was partly due to a favourable monsoon that reduced cooling demand, as well as a "strong growth in renewable energy", leading to lower coal use.

Global emission trends

China's emissions in 2025 are projected to increase by 0.4% – also a slower growth than in recent years. This was due to a "moderate growth in energy consumption combined with an extraordinary growth in renewable energy."

Keeping track: India is the third largest emitter of carbon dioxide at 3.2 billion tonnes annually. FILE PHOTO

Emissions are projected to grow in the United States (+1.9%) and the European Union (0.4%) in 2025.

Overall, India is the third largest emitter of carbon at 3.2 billion tonnes annually (2024), led by the U.S. (4.9 billion tonnes) and China (12 billion tonnes). India's per capita emission is 2.2 tonnes of carbon dioxide per year, the second lowest among 20 of the largest economies globally. Coal is the major fuel type contributing to India's emissions.

The projected rise in global fossil CO2 emissions in 2025 is driven by all fuel types: coal +0.8%, oil +1%, natural gas +1.3%. Over the 2015-2024 period, emissions from permanent deforestation remained high around 4 billion tonnes of CO2 per year, while permanent removals through reafforestation and forest regrowth offsets about half of the permanent deforestation emissions.

Total CO2 emissions – the sum of fossil and land-use change emissions – have grown more slowly in the past decade (0.3% per year), compared to the previous decade (1.9% per year). The remaining carbon budget to limit global warming to 1.5°C is "virtually exhausted".

The remaining budget for 1.5°C is 170 billion tonnes of CO2, equivalent to four years at the 2025 emissions levels.

"With CO2 emissions still increasing, keeping global warming below 1.5°C is no longer plausible," said Professor Pierre Friedlingstein, of Exeter's Global Systems Institute, who led the study. "The remaining carbon budget for 1.5°C, 170 billion tonnes of carbon dioxide, will be gone before 2030 at current emission rate. We estimate that climate change is now reducing the combined land and ocean sinks - a clear signal from Planet Earth that we need to dramatically reduce emissions."

The latest numbers come even as world leaders are gathered in Belem, Brazil, to attempt progress in transitioning away from fossil fuel use while also negotiating how to pay for the costs of bolstering defence against the effects of human-caused climate change already underway.

Report → Global Carbon Budget by Global Carbon Project (GCP), an authoritative tracker of global fossil fuel emissions.

(i) India's Emissions Rise

- India's 2025 carbon emissions expected to grow 1.4%, slower than 4% growth in 2024.

(ii) Reason for Slower Rise

- Favourable monsoon reduced cooling demand.
- Growth in renewable energy lowered coal use.

(iii) India's Ranking

- India is the third-largest emitter of at 3.2 billion tonnes annually (2024).
- 1st: U.S. (4.9 billion tonnes)
- 2nd: China (12 billion tonnes)

(iv) Per Capita Emissions

- India's per capita emission: 2.2 tonnes per year
- 2nd lowest among the world's 20 largest economies.

(v) Main Fuel Contributor

- Coal is the major fuel driving India's emission