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# State of India's Environment 2026: 7 of 9 Planetary Boundaries Breached

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CURATED &amp; WRITTEN BY

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# State of India's Environment 2026: 7 of 9 Planetary Boundaries Breached

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## WHY IN NEWS:

The **Centre for Science and Environment (CSE)** released its annual **State of India's Environment 2026** report in late May 2026. Key findings: **7 of 9 planetary boundaries** are now transgressed (ocean acidification newly crossed); India experienced **extreme weather on 99% of days in 2025** with **4,419 weather-related fatalities**; the invasive **Lantana camara** has spread across nearly **50% of forests and scrubland**; and species extinction is running at **~100x** the natural background rate.

## ABOUT CSE

PARAMETER	DETAIL
Founded	1980 by <b>Anil Agarwal</b>
Headquarters	New Delhi
Director General	<b>Sunita Narain</b>
Mandate	Independent public-interest research and advocacy
Flagship magazine	<i>Down to Earth</i> (fortnightly)
Annual report	<i>State of India's Environment</i> (since 1982)

## THE PLANETARY BOUNDARIES FRAMEWORK

Proposed by **Johan Rockström and colleagues at the Stockholm Resilience Centre in 2009**, the framework identifies **nine Earth-system processes** with quantifiable “safe operating space” thresholds for humanity. Transgression of a boundary risks abrupt, non-linear environmental change.

## Status of the 9 Boundaries (2026 Update)

#	BOUNDARY	STATUS
1	Climate change	Breached
2	Biosphere integrity (genetic + functional diversity)	Breached
3	Land-system change	Breached
4	Freshwater change (blue + green water)	Breached
5	Biogeochemical flows (Nitrogen + Phosphorus)	Breached
6	Novel entities (chemicals, plastics)	Breached
7	Ocean acidification	<b>Newly breached (2026)</b>
8	Atmospheric aerosol loading	Within zone (under stress)
9	Stratospheric ozone depletion	<b>Safe</b> — Montreal Protocol success

## KEY SOE 2026 FINDINGS

### Extreme Weather

- India experienced **extreme weather events on 99% of days in 2025**.
- **4,419 weather-related fatalities** recorded in 2025.
- Annual climate-linked economic losses estimated at **₹5+ lakh crore** (CSE).

### Biodiversity Collapse

- Species extinction at **~100x the natural background rate**.
- **Lantana camara** has invaded an estimated **~13 million hectares** — nearly half of India's forest and scrubland.

### Ocean Acidification (Newly Breached)

- Surface-ocean pH has fallen from a pre-industrial **~8.21 to ~8.10** — a drop of 0.1 unit.
- Because pH is logarithmic, that translates to a **~30% increase in acidity**.
- Impacts: coral bleaching, stress on shell-forming organisms (corals, molluscs, pteropods), fisheries decline.

## LANTANA CAMARA — THE SILENT INVADER

ATTRIBUTE	DETAIL
Native to	Tropical Central and South America
Introduced in India	Around <b>1809</b> , Calcutta Botanic Garden (British colonial-era ornamental)
Spread (India)	~13 million hectares; ~50% of forests/scrubland affected
Ecological impact	Outcompetes native flora; alters fire regimes; reduces forage for wildlife
Recognition	Listed as a major invasive species under Indian forest management guidelines

Control strategies under research include **mechanical clearing combined with biological control** (FRI Dehradun trials) and **commercial value-chain models** (Lantana furniture by tribal cooperatives in Karnataka and Tamil Nadu).

## INDIA'S CLIMATE CONTEXT

- **Heat Action Plans (HAPs):** only ~23 functional city-level HAPs (2025); **Ahmedabad** was the South Asian pioneer (2013).
- **Per-capita emissions:** ~2 tCO<sub>2</sub> (vs USA ~14, China ~8).
- **Forest cover (ISFR 2023):** **21.76%** of geographical area (forest + tree cover = 25.17%).
- **Air quality:** **13 of the 20 most polluted cities globally** were in India (IQAir World Air Quality Report 2024); Byrnihat (Assam) was the most polluted city globally; Delhi the most polluted capital.
- **Renewables (March 2026):** ~150 GW solar; ~56 GW wind.

## INDIA'S RESPONSE FRAMEWORK

- **NAPCC (National Action Plan on Climate Change), 2008** — 8 missions (Solar, Enhanced Energy Efficiency, Sustainable Habitat, Water, Sustaining Himalayan Ecosystem, Green India, Sustainable Agriculture, Strategic Knowledge).
- **Updated NDC submitted to UNFCCC, August 2022** — **45% emission-intensity reduction (over 2005 baseline) by 2030, 50% of installed electric capacity from non-fossil sources by 2030, net-zero by 2070.**
- **National Mission for a Green India.**

## WAY FORWARD

- 1 Operationalise the **Kunming-Montreal Global Biodiversity Framework (KMGBF) 30x30** target in domestic law and budgets.
- 2 Scale **mechanical + biological Lantana control** alongside livelihood-linked harvesting.
- 3 Expand **Heat Action Plans** from 23 cities to all heat-vulnerable districts.
- 4 Push for operationalisation of the **Loss and Damage Fund** (Sharm el-Sheikh COP27 mandate; Dubai COP28 operational decision).
- 5 Strengthen protection of **Open Natural Ecosystems (ONES)** — grasslands, savannahs, ravines — which are currently classified as “wastelands”.

## UPSC RELEVANCE

- **GS Paper 3:** Conservation, environmental pollution, climate change.
- **GS Paper 1:** Geography — physical geography, ecosystems.
- **Mains Angle:** “Crossing the seventh planetary boundary — ocean acidification — converts climate risk into food-security risk.” Examine in the Indian context.
- **Prelims Angle:** Number of planetary boundaries; founder of CSE; year of NAPCC; India’s NDC targets.

**FACTS CORNER**

SoE 2026 release: late May 2026 by CSE

CSE founded: 1980 by Anil Agarwal

CSE Director General: Sunita Narain

Planetary Boundaries framework: Johan Rockström et al., Stockholm Resilience Centre, 2009 (9 boundaries)

Boundaries breached (2026): 7 — climate, biosphere integrity, land-system, freshwater, biogeochemical flows, novel entities, ocean acidification (new)

Lantana camara: native to Central/South America; introduced in India c. 1809; ~13 million ha affected

Extreme weather days in India (2025): 99% of days

Weather-related fatalities (India 2025): 4,419

Ocean pH decline since pre-industrial: 0.1 unit (8.21 → 8.10) = ~30% acidity rise

13 of top 20 most polluted cities globally in India (IQAir World Air Quality Report 2024); Byrnihat most polluted city, Delhi most polluted capital

India's forest cover (ISFR 2023): 21.76% (forest + tree cover 25.17%)

India per-capita emissions: ~2 tCO<sub>2</sub>

India NDC (updated Aug 2022): 45% emission-intensity cut by 2030; 50% non-fossil capacity by 2030; net-zero by 2070

Sources: [CSE](#), [Down to Earth](#), [MoEFCC](#)

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