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Oxford Study Places 14 Indian Cities Among the World's Most Heat-Risk Exposed

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CURATED & WRITTEN BY

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WHY IN NEWS

A **University of Oxford** study, published in the journal *Sustainable Cities and Societies*, assessed 205 large cities and ranked **14 Indian cities among the world's top 50** for urban heat risk. **Ahmedabad ranked second globally**, with **Nagpur and Madurai** also among the world's ten most heat-vulnerable cities; **Al Basrah (Iraq)** tops the global list. The findings highlight the growing danger of extreme urban heat in India and the urgent need for legally backed **Heat Action Plans** and heat-resilient cities.

WHAT THE STUDY FOUND

ASPECT	DETAIL
Study	University of Oxford, in <i>Sustainable Cities and Societies</i>
Scope	205 cities of over a million people worldwide
Indian cities in top 50	14, with Ahmedabad ranked second globally
Top globally	Al Basrah, Iraq
Method	Combines hazard, vulnerability and coping capacity

The ranking is not based on temperature alone. It combines three pillars: the **hazard** (exposure to extreme temperature), the **vulnerability** (social and demographic susceptibility, such as age and poverty) and the **coping capacity** (cooling access, tree cover and response systems), giving a fuller picture of risk than raw temperature.

UNDERSTANDING URBAN HEAT

CONCEPT	WHAT IT MEANS
Urban Heat Island (UHI)	Cities are hotter than surrounding areas because concrete, asphalt and buildings absorb and retain heat, with little green cover
Heatwave	A period of abnormally high temperature; in India it can be a notified disaster in some states
Heat stress	The strain on the human body from prolonged heat, which can be fatal, especially for the old, the poor and outdoor workers

Rapid, unplanned urbanisation, loss of green cover and water bodies, and climate change together intensify urban heat, making cities increasingly dangerous during summer. The **Urban Heat Island** effect can leave cities **3 to 5 degrees Celsius hotter** than their rural surroundings, and rising **night-time minimum temperatures** deny the body the cooler nights it needs to recover.

THE HEAT SCIENCE TOOLKIT

CONCEPT	WHAT TO KNOW
IMD heatwave criteria	A heatwave is declared in the plains at a maximum of 40 degrees Celsius or more (37 on the coast, 30 in the hills) with a departure from normal of +4.5 to +6.4 degrees ; it is severe above +6.4 degrees or at 47 degrees and above
Wet-bulb temperature	A measure combining heat and humidity; a wet-bulb temperature of about 35 degrees Celsius is the theorised limit of human survivability , beyond which sweating can no longer cool the body
The IMD limitation	India's heatwave declaration uses dry-bulb temperature and does not factor humidity, so it can understate the danger of humid heat

IS A HEATWAVE A "NOTIFIED DISASTER"?

A crucial governance gap: **heatwaves are NOT among the disasters notified under the Disaster Management Act, 2005**, which limits access to central disaster-relief funds.

- States may locally notify a heatwave as a "state disaster" and use up to **10 per cent of the State Disaster Response Fund (SDRF)** for it, a window opened by the 15th Finance Commission.

- The **16th Finance Commission (2025) recommended adding heatwaves (and lightning) to the notified-disaster list**, which would unlock fuller relief and standardised ex-gratia for victims.
- Notification matters because it determines whether heat deaths attract the same official response and compensation as floods or cyclones.

WHAT CAN BE DONE: HEAT ACTION PLANS

MEASURE	DETAIL
Heat Action Plans (HAPs)	Early-warning, advisory and emergency-response plans; now across about 23 heat-prone states and 130-plus cities , with 200-plus HAPs in all
Ahmedabad	Pioneered South Asia's first Heat Action Plan in 2013 , a widely cited model
India Cooling Action Plan (ICAP), 2019	The world's first national cooling plan; aims to cut cooling demand 20-25% by 2037-38
Cool-roof policy	Telangana's Cool Roof Policy (2023) was India's first state-wide mandatory cool-roof policy
Other levers	Mission LiFE, the National Mission on Sustainable Habitat, urban greening and nature-based solutions

Why Heat Action Plans Underperform

The study strengthens the case for treating heat as a serious, recurring disaster risk, but India's HAPs have known weaknesses that a strong answer should name:

- ❶ **Not legally binding.** HAPs are advisories, not enforceable mandates, so compliance is uneven.
- ❷ **Chronically underfunded.** Most lack a dedicated budget line, leaving measures unimplemented.
- ❸ **Generic, not localised.** Many are copied across cities and fail to map local vulnerability (slums, outdoor workers).
- ❹ **Short-term focus.** They emphasise warnings and advisories but neglect long-term mitigation (green cover, building norms) and ignore humidity and night-time heat.

The economic and human stakes are large. The **ILO estimates India could lose about 5.8 per cent of working hours, equivalent to roughly 34 million full-time jobs, to heat stress by 2030**, with agriculture and construction worst hit and the urban poor and outdoor workers bearing the burden.

UPSC RELEVANCE

Prelims

- An **Oxford** study (in *Sustainable Cities and Societies*) assessed **205 cities** and placed **14 Indian cities** in the world's top 50 for heat risk; **Ahmedabad ranked second globally**
- **Al Basrah (Iraq)** tops the global list
- The ranking combines **hazard, vulnerability and coping capacity**, not temperature alone
- **Wet-bulb temperature of about 35 degrees Celsius** is the theorised human survivability limit
- IMD heatwave criterion in the plains: maximum of **40 degrees or more** with a **+4.5 to +6.4** departure (severe above +6.4 or at 47)
- Heatwave is **not a notified disaster** under the DM Act, 2005; the **16th Finance Commission (2025)** recommended adding it
- **Ahmedabad** pioneered South Asia's first **Heat Action Plan** in 2013; **ICAP (2019)** is the national cooling plan

Mains Angles

- ① **GS3 Disaster Management:** "India's Heat Action Plans are necessary but insufficient." Critically examine and suggest reforms.
- ② **GS1 Urbanisation:** Discuss how unplanned urbanisation and loss of green cover intensify the Urban Heat Island effect.
- ③ **GS3 Environment / GS2 Governance:** Should heatwaves be a notified disaster under the DM Act, 2005? Examine the case and its implications.

FACTS CORNER

FACT	DETAIL
Study	University of Oxford, in <i>Sustainable Cities and Societies</i> (205 cities)
Indian cities in top 50	14 (Ahmedabad 2nd globally; Nagpur 4th, Madurai 7th)
Top globally	Al Basrah, Iraq
Method	Hazard + vulnerability + coping capacity
Wet-bulb limit	~35 degrees Celsius (human survivability)
IMD heatwave	Plains: 40 degrees-plus, +4.5 to +6.4 departure
Disaster status	Not notified under DM Act 2005; 16th FC (2025) recommends adding it
First HAP / cooling plan	Ahmedabad, 2013 (South Asia's first); ICAP, 2019
Economic cost	ILO: ~34 million jobs / 5.8% of work hours lost to heat by 2030

Sources: *University of Oxford, NDMA, Down To Earth*

Source: Oxford Study Places 14 Indian Cities Among the World's Most Heat-Risk Exposed — Ujjari.com | Free UPSC & State PCS Current Affairs

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