



INDIA UNDER HEAT STRESS: THE GROWING REALITY OF A WARMING NATION

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India is heating up, and the signs are becoming impossible to ignore. Summers that were once considered unusually harsh are now becoming routine. Cities are recording temperatures that push human endurance to dangerous limits, rural communities are struggling with shrinking water supplies, and even nights are offering little relief from the relentless warmth. The growing concern among scientists is clear: India is warming faster, and heatwaves are becoming more intense, more frequent, and more dangerous.

For many Indians, heat is not a new phenomenon. The subcontinent has always experienced hot summers, particularly in northern and central regions. But what is changing is the character of this heat. It is arriving earlier, staying longer, and reaching levels that disrupt daily life in unprecedented ways. A hot day is no longer simply uncomfortable. It can become a public health emergency.

Recent years have offered troubling examples. Cities such as Delhi, Jaipur, Nagpur, and Ahmedabad have repeatedly witnessed temperatures soaring beyond 45 degrees Celsius. In some areas, roads have softened, power demand has surged to record levels, and hospitals

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transport, and deforestation, is increasing average global temperatures. However, some regions are warming faster than others due to geographical and local environmental factors. India's rapid urbanisation has created sprawling concrete landscapes that trap heat. Trees and open green spaces that once provided cooling have been replaced by asphalt, glass, and dense construction. This creates what scientists call the urban heat island effect, where cities remain significantly warmer than surrounding areas.

Another worrying factor is humidity. Heat alone is dangerous, but when combined with high humidity, the human body struggles to cool itself

through sweating. This can lead to dangerous heat stress, even when temperatures are lower than traditional heatwave thresholds. Coastal cities and densely populated urban centres are particularly vulnerable to this invisible threat.

The impact extends far beyond personal discomfort. Agriculture, which supports millions of livelihoods in India, is highly sensitive to temperature extremes. Crops such as wheat can suffer reduced yields if exposed to intense heat during critical growth stages. Livestock also experience stress, affecting milk production and overall health. For small farmers already coping with uncertain rainfall and rising input costs, extreme heat adds another layer of hardship.

Water security is becoming another casualty. Heatwaves accelerate evaporation from reservoirs, lakes, and soil, worsening shortages in already water stressed regions. Communities dependent on groundwater may find wells drying faster than expected. In cities, increased demand for cooling and water can strain already fragile infrastructure, creating unequal access where wealthier households cope better than vulnerable communities.

The economic consequences are equally serious. Productivity declines sharply when temperatures become unsafe for physical work. Businesses face disruptions from power shortages and infrastructure stress. Healthcare systems bear the cost of treating heat related illnesses. Researchers increasingly warn that extreme heat could become a major drag on India's economic growth if adaptation measures are not strengthened.

Yet the burden is not shared equally. Heat is often described as a silent killer because its impacts are uneven and sometimes overlooked. Elderly people, children, people with chronic illnesses, and low income households are especially vulnerable. Families living in poorly ventilated homes or informal settlements may lack access to fans, air conditioning, or reliable electricity. For them, extreme heat is not merely an inconvenience. It is a threat to survival.

Despite these challenges, there are reasons for cautious optimism. Several Indian cities have begun implementing heat action plans, which include early warning systems, public awareness campaigns, cooling shelters, and emergency

Medical preparedness must also become a central part of climate adaptation strategies. Hospitals and emergency services need stronger infrastructure and better coordination to handle the growing number of heat-related illnesses during extreme weather events. Public awareness campaigns, early warning systems, cooling shelters, and community outreach can significantly reduce fatalities, especially among vulnerable populations such as outdoor workers, children, and the elderly. Ahmedabad's Heat Action Plan is often cited as an example of proactive adaptation, showing how timely warnings and coordinated responses can save lives. Expanding such efforts nationwide could greatly improve India's resilience against rising temperatures.

Long-term solutions require deeper structural change. Cities must be designed with climate resilience in mind. More trees, reflective building materials, shaded public spaces, better water management, and improved housing can all reduce urban heat exposure and help combat the urban heat island effect. At the same time, cleaner transport systems and renewable energy adoption are essential for addressing the root causes of climate change while also reducing pollution and improving public health.

Individual action matters too, though systemic solutions remain essential. Staying hydrated, avoiding peak afternoon exposure, checking on vulnerable neighbours, and recognising early symptoms of heat stress can make a real difference during extreme events. Increased public awareness and community preparedness can help prevent many heat-related emergencies before they become severe.

India stands at a crucial moment. Heatwaves are no longer isolated weather events to be endured and forgotten; they are becoming a recurring reality linked to a warming climate. Their impacts extend beyond public health, affecting agriculture, water resources, labour productivity, and overall economic stability. The question is not whether India will face more extreme heat, but how prepared the country will be to protect its people, economy, and ecosystems from its intensifying grip.