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UNDERSTANDING HEAT STRESS IN INDIA'S CHANGING CLIMATE

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India is increasingly confronting a silent but deadly crisis heat stress brought on by rising global temperatures and frequent extreme heat events. As climate patterns shift, heatwaves are becoming longer, more intense, and more widespread across the country. In April 2025, New Delhi recorded temperatures exceeding 40°C much earlier than usual, with Barmer in Rajasthan touching 46.4°C breaking decades-old temperature records. Such extremes are not isolated; they reflect a worrying trend of climate volatility, particularly in South Asia.

Heat stress arises when the body struggles to regulate its internal temperature due to prolonged exposure to high heat and humidity. This can result in dehydration, reduced mental and physical function, and in severe cases, heatstroke or death. Vulnerable groups such as daily wage laborers, the elderly, children, and those without access to cooling infrastructure are at the greatest risk. In India, where a significant portion of the population lives in densely packed urban areas or works outdoors, these impacts are particularly acute.

Urbanization has amplified the dangers of heat stress. Cities like Delhi, Hyderabad, and Ahmedabad often experience the urban heat island effect, where built-up areas trap heat, causing nighttime temperatures to remain high. Lack of tree cover, reflective building materials, and access to shade in these urban zones exacerbates discomfort and health risks. As more people move to cities and construction continues at a rapid pace, these conditions are likely to worsen.

Recent assessments have highlighted how pervasive and dangerous this phenomenon has become. A study published in May 2025 found that over 75% of India's population now resides in districts that face high or very high risk from heatwaves. States like Uttar Pradesh, Bihar, Madhya Pradesh, and West Bengal have seen both an increase in daytime maximum temperatures and sustained nighttime heat, which prevents the body from recovering after a day of exposure. This emerging threat is not only a health concern but also a socio-economic burden.

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Economically, heat stress has already begun reducing worker productivity and affecting livelihoods. In sectors like agriculture and construction where labor is physically intensive and conducted outdoors workers are being forced to reduce their working hours to avoid heat-related illness. According to estimates by international labor organizations, India stands to lose millions of work hours annually due to extreme heat. This not only impacts individual earnings but also strains local and national economies.

India has taken initial steps to address this growing threat. Cities such as Ahmedabad were among the first to adopt Heat Action Plans (HAPs), which include early warning systems, public education campaigns, and training of health workers to recognize and treat heat-related illnesses. These plans also aim to make drinking water more accessible, distribute cooling kits, and advise on work-rest cycles for vulnerable groups. However, the coverage and implementation of such plans remain uneven across the country.

A comprehensive approach to heat resilience must go beyond emergency response. Cities need to redesign public spaces with shade structures, green corridors, and heat-reflective building materials. Rooftop gardens, cool roofs, and increased vegetation can significantly reduce ambient temperatures. For rural areas, promoting water conservation, community cooling centers, and traditional building techniques that reduce indoor heat can be effective.

Strengthening the healthcare system is another key area. Hospitals must be prepared to handle heat-related emergencies, particularly during peak summer months. Data collection systems should monitor heat illnesses in real-time, enabling quicker response and better planning. Community outreach programs must prioritize educating people on how to stay safe during heatwaves, especially in local languages and through grassroots networks.

The crisis of heat stress also underscores broader concerns around climate equity. Those who contribute least to climate change such as rural farmers or slum dwellers suffer its effects the most. It is therefore imperative that adaptation strategies prioritize these communities by providing access to resources, information, and infrastructure that can shield them from the worst effects.

Addressing heat stress in India requires coordinated action across multiple sectors urban planning, health, energy, labor, and education. As the climate continues to change, India must act swiftly to adapt and protect its population. Recognizing heat stress as both an immediate and long-term challenge is essential for ensuring public health, economic resilience, and sustainable development in a warming world.

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