

Accelerating Extreme Heat Responses: Perspectives from India



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INTRODUCTION

Accelerating Extreme Heat Responses: Key Perspectives from India

By Shombi Sharp, RCO, UN Resident Coordinator, India

The heat is on. With the decade ending last year being the warmest on record, an estimated 1.2°C above pre-industrial levels already, we face an urgent need to limit global warming and its devastating impacts. Extreme heat stands out as one of the most pressing, fast-growing climate challenges, affecting billions worldwide.

The implications are staggering. Evidence suggests an annual 1°C increase in temperature leads to a more than 9 per cent increase in poverty. Further, 12 per cent of all food produced is lost due to a lack of cooling and the equivalent of 80 million full-time jobs could be lost due to heat stress by 2030, not to mention health impacts including significant loss of life.

This underlines the urgency of the Call to Action on Extreme Heat issued by United Nations Secretary-General António Guterres, who stressed that "Earth is becoming hotter and more dangerous for everyone, everywhere."

Limiting warming to 1.5°C is crucial to reduce risks and impacts on human health, food security, and ecosystems. This goal requires tripling renewable energy capacity and doubling energy efficiency improvements by 2030 while accelerating the transition away from fossil fuels. At the same time, climate-smart infrastructure and cooling strategies are urgently needed.

India, home to one-sixth of the world's population, is at the forefront of this climatic challenge. The subcontinent is experiencing a dramatic increase in the frequency and intensity of heatwaves. According to the India Meteorological

Department, May 2024 was the hottest May in 36 years, with temperatures reaching alarming heights. Extreme heat has had devastating impacts, including exacerbating the urban heat island effect, where city temperatures can be up to 6°C higher than surrounding rural areas.

In response to this growing threat, India has initiated an ambitious strategy. The Ahmedabad Heat Action Plan, launched in 2013, has become a model for urban heat resilience. Research published in *The Lancet Planetary Health* demonstrates a significant 20% reduction in heat-related mortality since its implementation. Building on this success, the National Disaster Management Authority, in collaboration with United Nations agencies, is expanding and institutionalising heat action strategies nationwide.

The UN is at the forefront of partnering for solutions to address urban heat. In Chennai for example, UNEP has teamed up with the Chennai Metropolitan Development Authority and CEPT University to create an advanced Urban Heat Island Effect assessment methodology. This innovative approach will transform urban planning by providing a framework for sustainable cooling strategies adaptable to India's diverse urban environments.

However, these extreme heat events disproportionately affect the most vulnerable members of society, including young children, the elderly, and economically disadvantaged communities.

And the climate crisis is not gender-neutral. Women and girls face unique challenges due to climate change, which amplifies existing gender inequalities and poses risks to their livelihoods, rights, health, and safety. For instance, in agriculture, where women make up a significant portion of the workforce, extreme heat not only reduces crop yields but also increases physical strain. Pregnant women are at higher risk of complications and heat-related illnesses during extreme heat events.

The UN system in India remains committed to supporting both government and community-led initiatives. Our approach includes helping improve early warning systems, advocating for sustainable urban cooling solutions, strengthening healthcare systems to manage heat-related health issues, and promoting inclusive, gender-sensitive adaptation measures.

As we face this global challenge, India is increasingly leading by example through development solutions at scale domestically, supporting South-South Cooperation, and amplifying the voice of the Global South for Climate Justice. By accelerating our response to extreme heat through a comprehensive approach – incorporating thermal comfort standards into building codes, improving early warning systems, and strengthening healthcare infrastructure – we not only protect millions of lives but also pave the way for a sustainable, resilient future.

The time for action is now. Together, we can cool our world and safeguard our shared tomorrow. ■

Beyond Saving Lives: Rethinking Heatwave Preparedness in India

By Dr P G Dhar Chakrabarti, Chair Professor, Ramakrishna Mission Vivekananda University, West Bengal, India
(Based on a telephonic interview)

With its diverse geography and climate, India is no stranger to heatwaves. Over the years, we've witnessed their devastating impact firsthand, from soaring mortality rates to crippled agricultural yields. While commendable efforts have been made to address this growing concern, our approach to heatwave preparedness needs a critical reassessment. We must move beyond a solely mortality-centric approach and embrace a more holistic strategy that safeguards lives, livelihoods, and long-term well-being.

Firstly, it's crucial to acknowledge the uneven distribution of heatwave risk across India. For instance, regions in Northwest and Central India are particularly vulnerable due to a confluence of geographical factors and socio-economic conditions. Gangetic plains of West Bengal and Bihar are particularly vulnerable due to the impact of wet bulb temperature. Tailoring heat action plans to these regional nuances is not an option but a necessity.

Secondly, while existing heat action plans have successfully reduced mortality rates, their narrow focus on saving lives during peak heatwave periods needs broadening. These plans overlook the cascading and long-term socio-economic impacts that last long after the mercury dips. Daily wage earners lose income, agricultural produce wilts under the scorching sun, and healthcare systems strain immensely.



"When it is hot, our flowers wilt and lose their colour quickly. This makes it hard to sell them, and we struggle to make a living." – A flower seller in Ahmedabad.

A truly comprehensive approach to heatwave preparedness must address these multifaceted challenges. We need to invest in robust early warning systems that provide vulnerable communities with timely and actionable information. Public awareness campaigns should go beyond basic health advisories and educate citizens on coping mechanisms, available resources, and government support systems.

Furthermore, we must explore innovative solutions to mitigate the economic impact of heatwaves. Expanding crop insurance schemes to cover heatwave-related losses can provide a much-needed safety net for farmers. Similarly, a network of cold chains can save perishable goods like fruits, vegetables, and dairy products. Temporary financial assistance programs can help daily wage earners cope with income loss during extreme heat events.

And finally, building community resilience should be paramount. Empowering local communities to identify their unique vulnerabilities and develop context-specific solutions is crucial. This includes promoting traditional heat adaptation practices, strengthening community healthcare infrastructure, and fostering collaborative knowledge-sharing and resource mobilisation networks.

The fight against heatwaves is not just about preventing deaths and illness; it's about safeguarding the well-being of our citizens and ensuring a secure future for all. By adopting a comprehensive approach encompassing early warning, community empowerment, and socio-economic resilience, we can mitigate the multifaceted risks of heatwaves and build a more resilient India. ■

Beyond Research: Turning Heatwave Knowledge into Action in India

By *Dr. Krishna AchutaRao*, Professor, Centre for Atmospheric Sciences Affiliate Faculty, Indian Institute of Technology Delhi, India

India is staring down a future of increasingly frequent and intense heatwaves. As someone who has spent over three decades studying climate change, I have seen firsthand the devastating impact these extreme events have on human lives, our economy, and existing social inequalities. While research on heatwave risks in India has expanded significantly, translating this knowledge into effective policy action remains a critical and urgent challenge.

One of the first things we must acknowledge is that heatwave risk is not uniform across India. Regions like the northwestern part of the country, extending from Gujarat and Rajasthan, are inherently more susceptible to extreme heat. This geographical disparity necessitates region-specific vulnerability assessments and tailored adaptation strategies. A one-size-fits-all approach will not work.

Another significant challenge lies in quantifying the full spectrum of

heatwave impacts. While the immediate consequences – heatstroke deaths, and crop failures – are readily apparent, the long-term economic and social repercussions are often more complicated to grasp. While we can calculate immediate economic losses, understanding the cascading effects on communities and livelihoods over time requires more nuanced methodologies. We need to develop better tools to measure what we currently struggle to quantify.

Effective governance is paramount in bridging the gap between research and action. This involves clearly defining roles and responsibilities across different levels of government – national, state, and local. We need streamlined coordination to ensure that research findings inform policy decisions and that these policies are implemented effectively on the ground. This also means providing local governments with the resources and capacity they need to develop

and execute heat action plans tailored to their specific contexts.

Despite the growing body of research highlighting these complexities, translating findings into concrete policy interventions remains a persistent hurdle. Bureaucratic inertia, limited political will, and inadequate funding hinder the process. This disconnect between research and action underscores the need for a more integrated approach to heatwave risk management in India.

So, how do we bridge this gap?

Firstly, we need stronger collaborations between researchers, policymakers, and community stakeholders. This means creating platforms for dialogue, ensuring research findings are disseminated in accessible formats, and actively involving communities in shaping policy decisions. Secondly, we must prioritise investments in heatwave preparedness and adaptation measures, particularly in highly vulnerable regions. This includes strengthening early warning systems, improving healthcare infrastructure, and promoting community-based heat action plans.

As climate change continues to escalate, the urgency to address heatwave risks in India cannot be overstated. We need a proactive and coordinated approach that prioritises evidence-based policymaking, inter-agency collaboration, and community engagement. Only by bridging the gap between research and action can we hope to mitigate the devastating impacts of heatwaves and secure a more resilient future for all Indians. ■



"We are used to working under the sun. We do not enjoy it, but what choice do we have? I have to work to feed my family." - A woman construction worker in Delhi.

Heatwaves: A Looming Disaster Demanding State-Level Action in India

By Abhiyant Tiwari, Lead – Health & Climate Resilience, NRDC India

India, with its diverse climate and vast population, is particularly vulnerable to the impacts of climate change. Among the most pressing challenges we face are heatwaves, which have become increasingly frequent and intense in recent years. While the issue has garnered some attention, there remains a significant gap between the problem's urgency and our response's robustness.

My experience working on heatwave mitigation for over a decade with non-profit and for-profit organisations has highlighted the critical need for a multi-pronged approach. We must move beyond simply acknowledging the problem and work towards concrete solutions, prioritising preparedness, response, and long-term resilience.

One of the most significant roadblocks to effective heatwave management is the lack of recognition of heatwaves as a formally notified disaster at the national level. While seven states have taken the initiative to classify it as such, a unified approach is essential. However, rather than waiting for national-level action, which can often be slow and mired in bureaucratic hurdles, I believe the focus should be on empowering individual states to take charge.

There is no dearth of funds for disaster management in India. The real challenge lies in streamlining our actions and ensuring that resources are utilised effectively. Each state has unique vulnerabilities and capacities; a centralised approach to heatwave management



"You cannot trust the weather. One day, it is scorching hot; the next, it is humid, and then suddenly, we are hit with these unseasonal downpours. I can never predict how much stock to buy. My snacks get soggy, or I run out completely." - A woman running a roadside snack cart.

is unlikely to address these nuances. By encouraging states to designate heatwaves as state-specific disasters, we empower them to develop context-specific action plans, allocate resources efficiently, and build local resilience.

Furthermore, capacity building is crucial. We must invest in training and education programmes for local communities, healthcare workers, and disaster management authorities. These programmes should enhance their understanding of heatwave risks, early warning systems, and effective response mechanisms.

Research and innovation also have a critical role in improving heatwave management. We must invest in

developing and deploying cost-effective cooling solutions, improving urban planning to mitigate the urban heat island effect, and strengthening early warning systems to provide timely and actionable information to vulnerable populations.

The human cost of heatwaves can be devastating. We have a moral imperative to act decisively and strategically to protect our most vulnerable citizens. By empowering states, investing in capacity building, and fostering a culture of research and innovation, we can build a more resilient India that is better equipped to face the challenges of a changing climate. ■

Heatwaves in India: Assessing Vulnerability and Government Response

By Prof Vinod K. Sharma, Vice Chairman, Sikkim State Disaster Management Authority, Govt. of Sikkim, India

As a professor of disaster management, I have witnessed the devastating impacts of heatwaves in India. These extreme weather events are becoming increasingly frequent and intense, posing a significant threat to human health, agriculture, and infrastructure. While India has made strides in disaster preparedness, a more nuanced understanding of heatwave vulnerability and the effectiveness of government interventions is crucial for building a heatwave-resilient nation.

Vulnerability to heatwaves is not uniform across the population. A complex interplay of factors, including age, socioeconomic status, occupation, and geographic location, shapes it. Older adults, children, pregnant women, outdoor labourers, and those living in informal settlements are particularly susceptible to heat stress. In my opinion, the lack of comprehensive data on vulnerable populations hinders targeted interventions. For instance, while government schemes exist for housing and microfinance,

their linkage to heatwave mitigation remains tenuous.

The Indian government has implemented several initiatives to combat heatwaves, including the National Disaster Management Plan and Heat Action Plans at the state level. These plans encompass early warning systems, public awareness campaigns, and the establishment of cooling centres. However, a closer examination reveals gaps in their effectiveness. I think many HAPs lack local context and fail to address the needs of vulnerable groups adequately. Heatwaves tend to be treated as isolated events rather than incorporating them into a multi-hazard approach.

Several recommendations deserve attention to enhance India's resilience to heatwaves. First, we need a paradigm shift from a reactive to a proactive approach. This requires investing in robust early warning systems accessible to all, particularly vulnerable communities. Second, HAPs should be tailored to local contexts,

incorporating insights from communities and relevant stakeholders. This includes identifying and mapping vulnerable populations, understanding their needs, and designing interventions accordingly.

Third, existing government schemes should be reviewed and, where possible, redesigned to address heatwave risks. For example, the government's focus on solar energy could be leveraged to promote rooftop solar installations in low-income communities, providing affordable cooling solutions. Fourth, there is an urgent need for more research on the impacts of heatwaves on different sectors, particularly agriculture and public health. This research should inform the development of evidence-based adaptation strategies.

Finally, raising public awareness about heatwave risks and preventive measures is paramount. This can be achieved through targeted campaigns utilising various media platforms, community outreach programs, and incorporating heatwave education into school curriculums.

Addressing the growing threat of heatwaves in India demands a multi-pronged approach. By prioritising vulnerability reduction, strengthening government interventions, and fostering a culture of preparedness, we can mitigate the impacts of these extreme events and build a safer and more resilient future for all Indians. ■



"I stand here all day under the sun to sell my vegetables. This umbrella offers a little shade, but the heat is relentless." - A woman selling vegetables from her cart on a Delhi roadside.

The Unheard Voices of India's Heatwaves: Demands from the Frontlines

By Madhukar Sanap, Head - Emergency Management & Developmental Programs, Aga Khan Agency for Habitat India, Maharashtra, India

India's battles with increasingly severe heatwaves are often told through statistics – rising temperatures, soaring heatstroke cases, and economic losses. However, behind these numbers lie the lived experiences and urgent demands of communities grappling with the scorching reality on the ground. This article amplifies the voices of those most affected, highlighting their needs and advocating for a more inclusive and responsive approach to heatwave management.

For those living on the margins, heatwaves are not merely an inconvenience but a threat to survival. In India's sprawling slums, where cramped living conditions and lack of ventilation turn homes into ovens, residents demand access to cooling centres and affordable cooling solutions. Their call for basic amenities like clean drinking water and sanitation becomes even more critical as temperatures soar.

Rural communities, the backbone of India's agricultural sector, face different challenges. Farmers, already grappling with climate change's unpredictable impacts, demand better early warning systems that reach remote villages and provide actionable information in local languages. They seek financial support to cope with crop losses and invest in climate-resilient agricultural practices.

Women, often tasked with household chores and caring for children and the elderly, bear a disproportionate burden during heatwaves. They demand access to healthcare facilities equipped to



"When it is this hot, nobody wants a shave, let alone a haircut. I am lucky to make half of what I usually do." – A roadside barber from Ahmedabad

handle heatstroke, particularly for vulnerable groups like pregnant women and infants. Their voices highlight the need for gender-sensitive heat action plans that address their unique needs and vulnerabilities.

Across the board, there is a resounding demand for greater awareness and education about heatwave risks and preventive measures. Communities want accessible information disseminated through trusted channels, empowering them to protect themselves and their families. They seek training programs on first aid for heatstroke and community-led initiatives to build resilience.

The demands of affected populations underscore the need for a paradigm shift in India's approach to heatwave management. It is time to move beyond reactive measures and embrace a proactive, inclusive, and community-centric approach. This requires:

Prioritising the needs of vulnerable communities: Heat action plans must be tailored to local contexts and address the specific challenges different groups face.

- **Strengthening last-mile connectivity:** Early warning systems and information dissemination channels must reach even the most remote areas.
- **Empowering communities:** Providing access to information, resources, and training will enable communities to participate actively in heatwave preparedness and response.
- **Investing in long-term solutions:** Promoting sustainable urban planning, green infrastructure, and climate-resilient livelihoods.

Listening to the voices of those most affected by heatwaves is not just a matter of social justice; it is essential for building a genuinely resilient India. By placing their needs and demands at the heart of our efforts, we can create a future where everyone can thrive, even in the face of rising temperatures. ■

Kerala's Fight Against the Heat: Utilising Government Schemes for Effective Heatwave Mitigation and Management

By Joe John George, Consultant, UNICEF, Kerala, India

Despite its lush greenery and coastal location, Kerala is not immune to the growing threat of heatwaves. However, the state government's proactive approach has reassured its citizens. It has implemented various schemes and interventions to mitigate the impact of extreme heat, making Kerala a safer place. This article explores these initiatives, highlighting how they contribute to a more heat-resilient Kerala.

Integrating Heatwave Mitigation into Government Policies

Recognising that heatwaves are a growing threat exacerbated by climate change, Kerala has taken proactive steps to integrate heatwave mitigation strategies into various government policies. The state has noted heatwaves, sunstroke, and sunburn as a state-specific disaster in 2019. Other measures include

incorporating climate-resilient design in urban planning regulations, promoting drought-resistant crops in agriculture policies, and mandating workplace safety measures to protect labourers from heat stress, demonstrating the government's commitment to everyone. Kerala has many labourers from other states, and such measures protect them. Kerala aims to build a more resilient and adaptable society by mainstreaming heatwave preparedness across different sectors. Kerala has a clear protocol for declaring heatwaves as state-specific disasters, enabling the government to access funds from the State Disaster Response Fund (SDRF) for relief and rehabilitation. The first heatwave warning in the state was given in the year 2016 by IMD and in 2024, the first death was reported due to heatwave. The Heat Action Plan 2020 directs around 27 nodal

departments on heat preparedness and mitigation.

Kerala State Disaster Management Authority and the Heat Action Plan

The Kerala State Disaster Management Authority takes the lead in Kerala's proactive approach to heatwave preparedness with its comprehensive Heat Action Plan. This multi-sectoral strategy utilises a network of weather stations to issue timely heatwave alerts, providing a crucial window for readiness. KSDMA also conducts extensive public awareness campaigns across various media channels, educating citizens on heat risks, prevention strategies, and the importance of hydration. Furthermore, during heatwaves, the government collaborates with local bodies to establish cooling centres in public spaces, offering respite from the heat, particularly for vulnerable



"The heat is brutal. By midday, the fish starts to spoil even with ice. I have to sell it quickly, or I am left with waste and lost income." - A woman selling fish by the roadside in Kerala.



"This heat is unbearable. It is affecting my mobility and how much work I can commit. It makes me slower, which means loss of work and less income." - A construction worker from Kerala.

populations. KSDMA has also produced educative materials in Braille and Sign Language on Heatwave as persons with disabilities are more vulnerable to heatwave, and so are children and elderly.

Local Level Action: Directives and Advisories for Proactive Heatwave Management

Recognising the importance of local-level action, the Kerala government issues directives and advisories to district administrations and local bodies ahead of and during heatwave periods. These include guidelines for adjusting school timings to avoid peak heat hours, advising employers to provide adequate shade and drinking water (known as *thanneer pandol*) for outdoor workers, and directives for health officials to conduct community outreach programs on heatwave preparedness and first aid. These proactive measures at the grassroots level are crucial in minimising the impact of heatwaves on vulnerable populations and ensuring a coordinated response. Water kiosks are also arranged at the

LSG level to ensure a potable drinking water supply.

Harnessing Existing Schemes for Heat Resilience

Kerala leverages existing government schemes to enhance heatwave preparedness and response as well as drought risk reduction:

- **Mahatma Gandhi National Rural Employment Guarantee Scheme:** This scheme, primarily aimed at providing rural employment, is utilised to create green spaces, plant trees, and improve water harvesting structures, contributing to long-term heat mitigation.
- **Aardram Mission:** This flagship program, which focuses on comprehensive health care, takes on added significance during heatwaves. Aardram Mission strengthens primary health centres, ensures adequate medical supplies, and trains health workers to identify and treat heat-related illnesses, underscoring the importance of health care in the face of extreme heat.
- **Kudumbashree:** This poverty eradication and women

empowerment program plays a crucial and empowering role in community-level heatwave preparedness. Kudumbashree members conduct awareness drives, distribute ORS packets, and assist vulnerable individuals within their communities, demonstrating the strength of community involvement in the face of heatwave challenges.

Conclusion

Despite significant progress, Kerala faces challenges in heatwave preparedness, including combating the urban heat island effect through urban planning strategies prioritising green cover and efficient building design. Reaching vulnerable groups in informal settlements with targeted outreach to disseminate heatwave preparedness information and resources is also crucial. However, Kerala's proactive, multi-pronged approach, combining dedicated initiatives with existing government schemes, is a model for other states striving for a heat-resilient future. ■



"My hands are already rough from working with the coir, and this heat dries them out even more. It is getting harder and harder to twist the fibres into rope in this weather." - A woman who makes coir rope in Odisha, speaking about the summer heat.



"We have no roof over our heads, and the sun burns everything. Even cooking is a struggle. We collect water wherever we can, but it is never enough." - A woman living on a Delhi footpath with her family.

Combating Heatwaves in India: A Focus on Community Needs and Collaborative Action

By Nupur Tyagi and Mishel Mohan, Sphere India, Uttar Pradesh, India

Introduction

India faces a growing threat from extreme heat, a danger amplified by climate change. Heatwaves devastate vulnerable communities, straining healthcare systems and disrupting livelihoods. As a national coalition of humanitarian, development, and resilience organisations, Sphere India is committed to mitigating these risks and building a heat-resilient future for all Indians.

The Power of Knowledge and Collaboration

Our approach, which centres on knowledge sharing, capacity building, and fostering robust coordination among stakeholders, recognises the crucial role that each of our members plays as part of this collaborative effort. We believe that informed action stems from a strong foundation of research and a shared understanding of priorities for heatwave advocacy, coordination and response. Through capacity-building sessions, we empower local communities and organisations with the knowledge and skills to effectively prepare for and respond to heatwaves. We also actively engage in research and advocacy, generating knowledge products that inform policy decisions and guide practical interventions.

As part of the heatwave response strategy, we organised a series of webinars through the Sphere India Academy on strategies for combating heatwave impacts at the individual, community, and household levels, along with targeted sessions on informal

Heatwave Survival Guide for Informal Workers

What is Heat Wave?
A heatwave is a period of unusually high temperatures compared to the norm for a region. Heatwave conditions occur when the actual maximum temperature is $\geq 45^{\circ}\text{C}$, and severe heatwaves occur at temperatures $\geq 47^{\circ}\text{C}$.

How to know about a heatwave?
The India Meteorological Department (IMD) provides colour-coded heatwave warnings for the next 5 days through its daily bulletin and GIS-based visualisation platform. This information can be accessed at www.mausam.imd.gov.in

01 Wear light color clothes
• Wear long sleeves, and light-coloured, thin clothes.

02 Know Your Heat Wave Symptoms
• Dizziness
• Unconsciousness
• Rapid heartbeat
• Vomiting
• Muscle cramps
• Hot and red skin

03 IF ANY SYMPTOMS ACT FAST
• Move to a cooler area
• Loosen Clothes
• Drink cool water
• Seek medical help if not improved

What should be done if someone gets heatstroke?
Use a fan to lower temperature. Administer cool water. Place wet cloths on the neck, armpits, and groin.

04 Take frequent rest breaks
• Avoid working from 12 PM to 3 PM
• Always cover your head (with a damp cloth)

05 Consume more of these food items
Buttermilk / Chaas / Lassi, Lemonade, Coconut water, Fermented Rice/ Panta Bhat

Avoid these food items
Tea, Coffee, Alcohol, Carbonated drinks/ Soda

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economy workers, safety protocols for schools and children, mental health and psychosocial impact, infrastructure and technological solutions, etc. These sessions were organised in collaboration with national and local organisations and nodal government agencies to ensure contextualised and effective responses, including sessions in local languages for wider dissemination of

knowledge and building heatwave resilience. Several IEC materials on Heatwave Do's and Don'ts were also circulated in English and Hindi following the sessions within the networks of collaborating institutions. This ensures reach to a larger audience in response to heatwaves through a collaborative, network-driven approach.

Integrating Resilience into Existing Frameworks

Mainstreaming heatwave resilience into existing development schemes and policies is crucial for long-term impact. This integration is particularly relevant for urban and rural areas, where heatwaves can exacerbate existing vulnerabilities. For instance, incorporating heat-resilient design principles into housing schemes can significantly improve living conditions for low-income communities. Similarly, integrating heat stress management strategies into livelihood programs, especially those involving outdoor labour, is essential for protecting vulnerable workers. Developing and implementing effective heat action plans is crucial to building long-term resilience to heatwaves in the face of exacerbated climate impacts. This requires coordination among government bodies, ground-level

organisations, and vulnerable communities.

Understanding the Needs of Vulnerable Communities

Effective heatwave mitigation requires a deep understanding of the unique challenges faced by different communities. Those living in slums or on the outskirts of cities often lack access to basic amenities like shade, water, and healthcare, making them particularly susceptible to heat stress. Engaging with these communities directly, understanding their needs, and incorporating their insights into the design and implementation of solutions is not just essential but a moral imperative. The recent consultations organised by Sphere India and partners also emphasised the need for Community-Level Heat Resilience Action Plans that include vulnerable groups and their

vulnerabilities to ensure effective and targeted interventions.

Conclusion

The urgency of addressing heatwave risks in India cannot be overstated. As the intensity and frequency of heatwave incidents are expected to increase, greater coordination and collaborative action plans are essential. By pooling resources and expertise, we can develop innovative solutions and implement effective strategies to safeguard vulnerable communities. We can build a more resilient future through collaborative action, knowledge sharing, and a community-centric approach. We encourage everyone to learn more about heatwave impacts and mitigation efforts, collaborate, and support organisations working to protect vulnerable communities. Together, we can build a heat-resilient India. ■

HEATWAVE ACTION

The Unrelenting Heat: An Urgent Call for Action on India's Frontline

By Imran Majid, Manager for Programs, ADRA, India

The scorching breath of heatwaves is a growing global concern, but nowhere is it felt more acutely than in India. As someone who has spent over a decade working in disaster risk reduction, I have witnessed firsthand the devastating impact of these extreme weather events. The problem is no longer a distant threat; it is a stark reality unfolding across India, demanding immediate attention and proactive solutions.

India's diverse geography and climate make it particularly susceptible to heatwaves. While

almost all regions are at risk, my experience points to the northern part of the country as particularly vulnerable due to a combination of factors, including their proximity to the Thar Desert, low forest cover, and high population density.

Even regions typically known for their cooler climates, like Kashmir, are not immune. The valley, often celebrated for its snow-capped mountains and pleasant summers, is experiencing a changing climate. Rising temperatures and erratic weather patterns are increasing the likelihood of heatwaves even in this

mountainous region, impacting not only the health of its residents but also its delicate ecosystem and vital tourism industry.

India's approach to heatwaves includes strategies implemented both domestically and in global contexts. Domestically, India focuses on early warning systems, heat action plans, and public awareness campaigns to reduce heat-related risks. These efforts target vulnerable groups such as the elderly and outdoor workers, aiming to build resilience in urban and rural areas.

Internationally, India participates in climate agreements like the Paris Agreement, committing to reducing greenhouse gas emissions and adapting to climate impacts, including heatwaves. India also collaborates globally, sharing knowledge and engaging in joint initiatives to address common challenges related to heatwaves and enhance climate resilience. These actions underscore India's comprehensive strategy to address heatwaves nationally while contributing to global efforts on climate change mitigation and adaptation.

The consequences of inaction are dire. Heatwaves exacerbate existing vulnerabilities, pushing communities further into poverty and hardship. Agricultural production is declining, livelihoods are being impacted by disruptions, and constraints are being faced by public health systems. The most tragic consequence, of course, is the loss of precious lives. However, amidst this sobering reality, there is hope. We can mitigate the impact of heatwaves by focusing on two key areas: information dissemination and capacity building.

Firstly, we need to ensure that accurate and accessible information about heatwaves reaches every corner of the country. This includes raising awareness about the risks, early warning systems, and practical steps individuals and communities can take to protect themselves. We must bridge the gap between scientific knowledge and community action.

Secondly, building capacity at all levels is crucial. Professionals in disaster management, healthcare, and related fields must be equipped



"The heat gets worse every year, but our wages stay the same. The big contractors do not care if our children suffer in this heat. They do not provide any shade or water for them while we work." - A woman construction worker in Uttar Pradesh.

with the knowledge and skills to respond to heatwave emergencies effectively. All the stakeholders (government line departments, NGOs, CSOs, CBOs) must work in a coordinated manner to implement heat action plans and ensure the timely delivery of essential services.

Most importantly, we must empower local communities to become resilient to this growing threat. This involves providing them with the tools and resources to prepare for and cope with heatwaves, including access to cooling centres, promoting traditional heat management practices, and fostering community-based early warning and response systems.

Further measures can enhance India's response to heatwaves:

- **Urban Planning:** Implement strategies like green spaces and cool roofs to counter urban heat islands.

- **Infrastructure:** Upgrade to withstand heat, ensure reliable power for cooling, and improve water management.
- **Healthcare:** Expand facilities and training for managing heat-related illnesses.
- **Research:** Invest in studying heatwave impacts and innovative adaptation strategies.
- **Policy Integration:** Integrate heatwave resilience into broader climate and disaster plans.
- **International Cooperation:** Collaborate to share technologies and resources for climate resilience.

The fight against heatwaves is not just a matter of policy but of survival. By prioritising information dissemination and capacity building, we can equip ourselves to face this challenge head-on. Let us create a safer, more resilient India for future generations. ■

Kerala on the Frontlines: Battling Heatwaves and Building Resilience

By *Fahad Marzook, Hazard Analyst (Meteorology), KSDMA, India*

As an atmospheric scientist working with the State Disaster Management Authority (SDMA) in Kerala since 2018, I have witnessed firsthand the escalating threat of heatwaves in our region. While my initial focus was on translating weather forecasts into hazard warnings, the increasing frequency and intensity of heatwaves led to my current role overseeing the state's heat action plan. This firsthand experience has given me a unique perspective on the multifaceted impacts of heatwaves on Kerala, a state known for its tropical climate and lush greenery.

The most pressing concern regarding heatwaves is their impact on public health. Heatstroke, a life-threatening condition caused by prolonged exposure to high temperatures, poses a severe risk, particularly to vulnerable populations such as agricultural labourers, outdoor workers, and our elders. The increasing number of heatstroke cases and heat-related deaths in recent years is alarming. While our organisation focuses on disaster management, the escalating health risks associated with heatwaves necessitate a collaborative approach involving healthcare professionals, community workers, and policymakers.

Beyond public health, heatwaves have cascading effects on various sectors of Kerala's economy. Agriculture, a significant contributor to our state's GDP, is particularly

vulnerable. Reduced crop yields, livestock stress, and decreased labour productivity due to heat stress directly impact livelihoods and food security. Similarly, the tourism sector, a significant source of revenue for Kerala, suffers as extreme heat deters visitors and affects the overall tourism experience.

The increasing frequency and intensity of heatwaves we are experiencing in Kerala are linked to the broader issue of climate change. While our organisation primarily focuses on disaster management, addressing the root causes of climate change through mitigation and adaptation strategies is crucial. Recognising the growing threat of heatwaves, the KSDMA has developed a comprehensive heat action plan. This plan outlines strategies for early warning systems, public awareness campaigns, capacity building for healthcare professionals, and inter-agency coordination during heatwave events.

Kerala's proactive approach to heatwave management offers valuable lessons for other states facing similar challenges. Our emphasis on community-level preparedness, inter-agency coordination, and integrating heatwave preparedness into existing healthcare infrastructure can serve as a model. Furthermore, our focus on translating scientific data into actionable plans and public

awareness campaigns is crucial for effective heatwave mitigation. By sharing our experiences and best practices, we can collectively work towards building a more heat-resilient India.

There is a growing call to recognise heatwaves as a national disaster in India. Kerala, for example, has treated them as state-specific disasters since 2019, but this limits resources for crucial mitigation efforts. Currently, only 10% of the State Disaster Mitigation Fund can be used for all state-specific disasters, including heatwaves, leaving inadequate funding to address the increasing occurrences of heatstroke and sunburn. Classifying heatwaves as a national disaster would unlock greater resources and signify a unified national response to this escalating health crisis impacting states across India.

In conclusion, heatwaves are a growing threat to Kerala, impacting public health, the economy, and the environment. While our organisation is actively involved in managing the immediate impacts of heatwaves, addressing the root causes of climate change and implementing sustainable adaptation strategies is paramount. Through collaborative efforts, informed policy decisions, and community engagement, we can strive to build a more resilient Kerala equipped to face the challenges of a warming world. ■

From Campus to Country: Scaling Up: Heatwave Mitigation Strategies in India

By *Sudhakar Patra*, Professor and Head, Berhampur University, Odisha, India

As an academic deeply involved in climate change and disaster management research, I have seen India's escalating threat of heatwaves. My university, a state government institution, is situated merely five kilometres from the Gopalpur coast in Odisha, a region highly susceptible to various disasters. This proximity has fueled our commitment to tackling climate change and its consequences, including the growing menace of heatwaves.

Our university houses a dedicated Center of Excellence focused on disaster management and climate change. We recently hosted an

international conference on these pressing issues, underlining our dedication to understanding and addressing these challenges. Furthermore, our Department of Marine Science and Department of Environmental Science actively contribute to research and initiatives related to climate change and disaster management.

Within our campus, we have implemented practical measures to combat heatwaves, particularly during the scorching months of April and May. These include providing spray water systems, water coolers, and air conditioning in various departments and the library.

Recognising the vulnerability of our student population, we ensure cold drinking water is readily available in all hostels. Additionally, we have undertaken extensive tree planting initiatives, with 70% of our campus now covered in greenery, effectively lowering temperatures.

However, the challenge extends far beyond our campus. Heatwaves pose a multifaceted threat to India, impacting public health, agriculture, and the environment. Frequent power cuts during peak summer months exacerbate the situation, hindering the use of fans and air conditioners, particularly in rural areas.



"The sun is so harsh now. Everything is drying up - the leaves, the fruits, even the wells. It is a real struggle to grow anything these days." - A woman farmer in Odisha.



"The heat wilts the flowers so quickly now. I have to sell them for less because they do not last as long, and that means less money for me." - A flower seller in Odisha.

To effectively combat this growing threat, a multi-pronged approach is crucial. Short-term solutions include:

- **Ensuring Uninterrupted Electricity Supply:** This is critical for powering essential cooling devices, especially during peak heatwave periods.
- **Promoting Water Conservation:** Implementing rainwater harvesting systems and promoting responsible water usage can mitigate water scarcity during droughts.
- **Raising Public Awareness:** Educating communities about heatwave risks, preventive measures, and early warning signs is crucial.

Long-term strategies require a more systemic approach:

- **Developing Heat-Resistant Crops:** Investing in research and

developing crop varieties that can withstand high temperatures is essential for food security.

- **Strengthening Healthcare Infrastructure:** Improving healthcare facilities, particularly in rural areas, is vital to handle heatstroke cases and other heat-related illnesses effectively.
- **Investing in Early Warning Systems:** Establishing robust early warning systems can provide timely alerts and enable proactive measures to protect vulnerable populations.

The fight against heatwaves demands a collaborative effort. Government agencies, NGOs, and local communities must work in unison. With their deep reach in rural areas, NGOs can play a pivotal

role in raising awareness, implementing mitigation strategies, and providing immediate relief to affected populations.

The government should prioritise increasing funding for heatwave mitigation and management initiatives. This includes supporting research, strengthening healthcare infrastructure, and providing financial assistance to vulnerable communities.

Heatwaves are a stark reminder of the urgent need for climate action. By acknowledging the severity of this threat and working together to implement practical solutions, we can mitigate the impact of heatwaves and build a more resilient future for India. ■

HEATWAVE ACTION

Feeling the Heat: A Northeast India Policymaker's Call to Action on Heatwaves

By *Mridusmita Borah*, Project Officer (DRR), ASDMA, India

The Northeast region of India, known for its lush landscapes and vibrant cultures, is facing a growing threat: heatwaves. As a policymaker dedicated to this region, I see the alarm bells ringing. While the Northeast has always experienced variations in climate, the intensity and frequency of extreme heat events are unprecedented, demanding our urgent attention.

Several factors compound our region's vulnerability. Our economy is intricately linked to agriculture, with millions depending on rain-fed agriculture for their livelihoods. The delicate ecosystems of the Himalayas, upon which our region

relies, are already stressed by climate change. Furthermore, rapid, unplanned urbanisation exacerbates the urban heat island effect, putting further strain on our cities and towns.

Heatwaves significantly threaten various sectors of the Northeast's economy. Agriculture, the backbone of our region, suffers from reduced crop yields, livestock stress, and increased irrigation demands. The tourism sector, vital for our economy, faces disruptions due to extreme heat affecting visitor comfort and natural attractions. Additionally, heatwaves strain energy grids due to increased

cooling demands, potentially leading to power outages and disrupting industrial productivity.

Assam's tea production, a cornerstone of our economy, is facing unprecedented challenges due to heatwaves' increasing frequency and intensity. Scorching temperatures and erratic rainfall patterns disrupt the delicate growing cycle of tea, leading to plummeting yields and impacting the livelihoods of millions. Tea garden workers, a majority of whom are women, are particularly vulnerable. Working long hours under the sun exposes them to heatstroke, dehydration, and other heat-related illnesses. Records dating



"The afternoons are always quiet in the summer. People stay inside, so nobody is buying my crafts. Fewer customers mean less income." - A home-based artisan in Ahmedabad



"This heat is merciless. The mangoes and bananas ripen too fast, and then they rot. I am throwing away more fruit than I am selling these days. It is a terrible loss." - A woman selling fruit on the streets of Kerala.

back to 2013 reveal the severe impact of heatwaves on tea workers' health, with reports of widespread illness and even fatalities.

While national policies provide a foundation, we need a targeted approach for the Northeast. Here is what we must prioritise:

- **Region-Specific Heat Action Plans:** We need localised heat action plans tailored to the unique geographical and socio-economic contexts of each Northeastern state. These plans should include early warning systems, public awareness campaigns, and measures to protect vulnerable populations like farmers and outdoor workers.
- **Investing in Climate-Resilient Infrastructure:** Our infrastructure needs to withstand the impacts of

extreme heat. This includes developing heat-resistant infrastructure, improving water management systems to combat floods and droughts, and strengthening healthcare systems to cope with heat-related illnesses.

- **Empowering Communities with Knowledge and Resources:** Local communities are on the frontlines of climate change. We must empower them with the knowledge, skills, and resources to adapt. This includes promoting traditional knowledge of heat adaptation, supporting climate-resilient agriculture practices, and building capacity for disaster preparedness.

Crucially, our heat action plans must encompass immediate measures to provide relief during heatwaves.

This includes establishing cooling centres in easily accessible locations, ensuring uninterrupted water supply, and coordinating with healthcare providers to prepare for and respond to heat-related emergencies. Public awareness campaigns should educate citizens on recognising heat stress symptoms, staying hydrated, and taking necessary precautions.

The fight against heatwaves in Northeast India is about adapting to a changing climate and safeguarding our future. By enacting proactive, region-specific policies, investing in resilient infrastructure, and empowering our communities, we can mitigate the worst impacts of extreme heat and build a more sustainable and equitable future for all who call the Northeast home. ■

CONCLUSION

A Collaborative Approach to Building Extreme Heat Resilience in India

- By *Mehul Pandya*, Senior Coordinator, AIDMI, India

India faces a growing extreme heat crisis, with rising temperatures and increasingly frequent and intense extreme heat posing significant threats to human health, ecosystems, and economic productivity. The country's vast population, high poverty rates, and dependence on climate-sensitive sectors like agriculture make it particularly vulnerable to the impacts of extreme heat. Extreme heat has devastating consequences, leading to heatstroke, dehydration, respiratory problems, and increased mortality rates, loss of or slowing down of livelihood and income, particularly among vulnerable groups like older adults, children, and outdoor workers. Articles in this issue present a compelling case for a comprehensive and collaborative approach to addressing this urgent challenge not only to India but to our planet.

Key Messages and Recommendations

- Heat Knowledge is Cool Power:** The issue underscores the critical role of knowledge sharing and capacity building in fostering extreme heat resilience. It advocates empowering local communities and organisations with the knowledge and skills with matching funds to prepare for and respond effectively to extreme heat.
- Disseminating actionable information:** To effectively combat the growing threat of extreme heat, India needs to prioritise additional and accessible information dissemination. The Ministry of

Health, Disaster Management Authorities (both National and State), Local Governments, and Civil Society Organisations should further collaborate to deliver even more clear, concise and actionable information on heat risks, preventive measures, and early warning signs. Utilising diverse channels, public and private, including local languages, will ensure this vital information reaches all communities, empowering them to take timely action and minimise heat-related health to income to education risks.

- **Leveraging capacity-building sessions:** Leveraging national capacity to respond to extreme heat effectively is crucial. The National Institute of Disaster Management, State Health Departments, Academic Institutions, and NGOs should further collaborate to build on workshops and training programs. These sessions should target communities, healthcare workers, and other stakeholders, consolidating their own expertise and experience as well as equipping them with the knowledge and skills needed for extreme heat preparedness, response, and management. This collaborative approach will ensure a comprehensive and coordinated response to the growing threat of extreme heat in addition to reducing cost and saving time while achieving coherence.
- **Consolidating targeted resources:** Consolidating existing and developing new targeted, accessible resources is

crucial for extreme heat preparedness. The National Health Portal, in collaboration with State Disaster Management Plans, should prioritise creating and distributing educational materials that give long-term picture and skills. These resources, including brochures, posters, and videos, should be tailored for specific audiences, particularly vulnerable groups like informal workers small businesses, and children. Schools and colleges and print, electronic and social media outlets should actively disseminate these materials, ensuring widespread awareness and understanding of extreme heat risks and preventive measures.

- Funded Collaboration is Key:** Recognising that tackling extreme heat requires a multi-sectoral approach, this issue stresses the importance of future, long-term and funded collaboration among government agencies, NGOs, local communities, and other stakeholders. Collaboration without money and money collaboration has limited results, AIDMI has found in its almost decade-long work on extreme heat. Recommendations include:
 - **Accelerate coordination mechanisms:** Effective extreme heat response demands robust coordination mechanisms. The National Disaster Management Authority should lead the charge, establishing seamless communication and

information-sharing platforms among all levels – State, District, City, and Village level committees. This interconnected approach will facilitate coordinated action, ensuring everyone involved has access to real-time information and can respond effectively to evolving extreme heat situations.

- **Leveraging existing networks:** To effectively implement extreme heat response strategies, leveraging existing networks is vital. The National Platform for DRR, Sphere India, and Civil Society Organisations should collaborate with established community networks, particularly Self-Help Groups, to disseminate information, mobilise resources, and ensure a coordinated response. Similar Networks of works, cooperatives, and migrants should be encouraged to be formed and supported. Such networks can effectively reach vulnerable populations and facilitate community-level action.
- **Promoting public-private partnerships:** Public-private partnerships are crucial for developing innovative extreme heat solutions. The private sector – from big corporations to small businesses – has a big role to play. Government agencies should actively encourage Corporate Social Responsibility initiatives, engaging technology companies and insurance providers to directly focus on cooling technology, home to farm to forest as well as extreme heat loss insurance. These collaborations can drive the development of early warning systems, heat-resilient infrastructure, and targeted insurance products, ultimately mobilising resources and expertise to mitigate and

manage extreme heat risks effectively at a local level.

3. **Integrating Resilience into Existing Frameworks:** The issue emphasises the need to mainstream extreme heat resilience into existing development schemes and policies, particularly in urban and rural areas most vulnerable to extreme heat. Recommendations include:

- **Incorporating extreme heat considerations in urban planning:** India needs to prioritise heat-resilient urban planning to combat urban heat. Cool homes, cool wards, and cool cities must become an urgent reality. The Ministry of Housing and Urban Affairs, in coordination with Urban Local Bodies and Town Planning Organisations, should prioritise green spaces, cool roofs, and early warning systems in city design. Integrating these elements will help mitigate the urban heat island effect, creating cooler, more liveable cities for all. The role of street vendors, construction workers, and migrant families in this process must be fully and first supported.
- **Promoting climate-smart agriculture:** Indian farmers are already moving to climate-smart

agriculture. The government of India should prioritise climate-smart agriculture to enhance agricultural resilience to extreme heat. The Ministry of Agriculture and Farmers Welfare, in collaboration with the Indian Council of Agricultural Research and Agricultural Universities, should invest in research and development in addition to innovation and consolidation of heat-resistant crops and promote the adoption of water conservation techniques among farmers.

- **Cooling healthcare infrastructure:** Strengthening healthcare infrastructure, particularly in rural areas, is crucial for extreme heat resilience. The Ministry of Health and Family Welfare, State Health Departments and the National Rural Health Mission should prioritise improving healthcare facilities with an emphasis on community health and public health measuring. This includes ensuring adequate resources and trained personnel to effectively handle heatstroke cases and other heat-related illnesses, in addition to preventing health measures and ensuring timely and life-saving



"The water is getting too warm now. The fish are getting sluggish, and some are even dying. It is a worry, especially with the cost of everything else going up." - A fish farmer in Kerala, commenting on the impact of the heatwave.

medical care for vulnerable populations.

4. **Extending in Early Warning Systems and Response Mechanisms:**

The Indian Metrological Department has found effective ways to deliver the forecast where it matters the most. This is being consolidated. The issue highlights the importance of robust early warning systems to provide timely alerts and enable proactive measures to protect vulnerable populations. Recommendations include:

- **Wide scaling accurate and timely forecasting systems:** India must further prioritise accurate and timely forecasting to improve extreme heat preparedness. The India Meteorological Department, with support from the Ministry of Earth Sciences and academic institutions, should invest in advanced meteorological infrastructure and research focused on extreme heat. This will enhance forecasting accuracy, extend lead times, and enable more effective early warning systems for those who should take anticipatory action.
- **Evolving clear communication protocols:** Evolving further effective communication of extreme heat alerts is crucial for saving lives. The National Disaster Management Authority should quality evolve clear communication protocols, working with State Disaster Management Authorities and media outlets to ensure timely and accessible dissemination of extreme heat alerts to communities and relevant stakeholders.
- **Strengthening emergency response mechanisms:** Strengthening emergency response mechanisms is crucial

for minimising the impact of extreme heat. The National Disaster Response Force and State Disaster Response Forces should receive specialised training and resources to respond to extreme heat emergencies effectively. Additionally, health departments must ensure that hospitals are equipped to handle heat-related illnesses and provide a swift and effective response to protect lives and livelihoods with a focus on women and children.

5. **Addressing Demand-Side Solutions:**

The document highlights the importance of addressing the growing demand for energy, particularly for cooling, during extreme heat. Recommendations include:

- **Ensuring uninterrupted electricity supply:** To protect lives during extreme heat, ensuring uninterrupted electricity is crucial. The Ministry of Power, in collaboration with the Power Grid Corporation of India and State Electricity Regulatory Commissions, should prioritise reliable electricity supply, especially during peak extreme heat periods. This will ensure the functioning of essential cooling devices, providing life-saving relief from extreme heat, and protecting incomes and health.
- **Promoting energy efficiency:** Promoting energy efficiency is crucial for extreme heat resilience. The Bureau of Energy Efficiency should further incentivise energy-efficient appliances, while the Ministry of Housing and Urban Affairs should integrate energy efficiency into building codes at all levels. Public awareness campaigns can encourage

energy conservation practices, reducing strain on the power grid, to further cool homes and workplaces.

- **Exploring alternative energy sources:** Investing in renewable energy is crucial for mitigating climate change and reducing extreme heat vulnerability. The Ministry of New and Renewable Energy, alongside the Solar Energy Corporation of India, should prioritise investments in solar power, particularly for vulnerable communities and micro, small, and medium-sized enterprises involving women. Solar coolers, solar fridges, and solar cold storage are some examples. Encouraging private sector participation will be vital for scaling up renewable energy adoption and building a more resilient future for those who are affected by extreme heat in all sectors of the economy.

Conclusion

The issue provides direction for moving towards making a roadmap for building extreme heat resilience in India by emphasising the importance of knowledge sharing at all levels of collaboration between those who are affected and those who are not, mainstreaming resilience into existing frameworks, investing in the performance of early warning systems and response mechanisms, and addressing the growing energy demand. By adopting a proactive and multi-sectoral approach, India can effectively mitigate the impacts of extreme heat, protect its vulnerable populations, and build a more resilient future for all, not only in India but for all those who suffer from extreme heat across South Asia. In cooling the citizens, the most affected citizen and his or her work must be made cooler first. ■

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This special issue has a photo essay of small businesses that have been affected in India this summer 2024.

The views expressed in this publication are those of the author.

For Personal and Educational Purpose only.

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