

INFERNO



The Human Consequences of Rising Temperatures

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Photo: Piyush Singh



This report is dedicated to the resilient communities of construction workers, laborers, security guards, farmers, rickshaw pullers, security forces, teachers, students, street vendors and hawkers, househelps and all others whose unwavering spirit drives our society forward.

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Heatwave Inequities

The year 2024 has been recorded as the hottest year so far in human history and the pattern won't surprise if it loses its 'title' to 2025. This year, we witnessed the temperature surging to a record-breaking 52.3 degrees Celsius in Delhi's Mungeshpur, posing a significant threat to the lives and livelihoods of the general population. While there is ample and necessary discussion around climate change, the severity of its impacts on disadvantaged communities often goes unreported, exacerbating existing social and economic divisions within society.

Heatwaves, as a stark manifestation of global climate change, intersect with the United Nations Sustainable Development Goals (SDGs). Their intersection reveals the complexity and urgency of addressing the impacts of rising temperatures to ensure holistic and inclusive progress toward sustainability.

SDG 1: No Poverty¹

The economic ramifications of heatwaves are disproportionately felt by low-income populations who typically have limited resources to adapt. These groups often live in slums and organized clusters often termed substandard housing which lacks adequate cooling, increasing their exposure to extreme heat. It causes significant financial strain due to loss of income from reduced labor productivity, increased energy costs for cooling, and healthcare costs.

SDG 2: Zero Hunger and Achieve Food & Nutritional Security²

Agriculture, especially in regions reliant on rain-fed farming, is highly vulnerable to heatwaves. Extreme temperatures lead to soil degradation and loss of arable land, crop failures, reduced livestock productivity, and increased pest and disease outbreaks. These factors diminish crop quality and quantity, leading to lower food availability and higher prices. The nutritional quality of food is also compromised as stressed crops often have lower levels of essential nutrients, and reduced crop diversity leads to dietary deficiencies. For communities already vulnerable to food insecurity, these ramifications are particularly severe.

SDG 3: Good Health and Well-being³

Extreme heat puts immense strain on the human body, leading to heat-related illnesses such as heat exhaustion, heatstroke, and sunburns. Disadvantaged populations, including the elderly, children, and those with pre-existing health conditions, are particularly at risk. Moreover, high temperatures can worsen air quality, intensifying respiratory problems and increasing the prevalence of diseases like asthma. Addressing these health impacts requires targeted public health interventions and improved healthcare infrastructure to support at-risk populations during extreme heat events.

SDG 6: Clean Water and Sanitation⁴

Heatwaves lead to increased evaporation rates and decreased precipitation, reducing water availability in reservoirs, rivers, and groundwater sources. This affects not only drinking water supplies but also agricultural and industrial water use. Water scarcity strains water supply systems, particularly in urban areas where demand is high. Extreme heat can also stress infrastructure components like pipes and reservoirs, leading to leaks, bursts, and other infrastructure failures affecting the functionality of sanitation systems, such as sewage treatment plants and septic tanks.

SDG 8: Economic Growth and Decent Work For All⁵

Heatwaves reduce productivity, particularly in labor-intensive sectors: agriculture, construction, manufacturing, and more. Sectors heavily reliant on outdoor work or energy-intensive processes face operational disruptions or increased costs due to higher cooling demands or reduced efficiency of machinery in extreme heat. This leads to reduced profitability and potential job losses in industries. Heatwaves also impact tourism and outdoor recreational activities, affecting revenue streams in related jobs.

SDG 11 & SDG 13: Sustainable Cities and Communities⁶ and Climate Action⁷

Heatwaves exacerbate urban heat island effects, causing higher temperatures in cities compared to rural areas. This results in excessive heat stress among residents, especially vulnerable populations such as the elderly, children, and those with pre-existing health conditions. Heat-related illnesses and mortality rates can rise, putting pressure on healthcare systems. Social vulnerability amplifies during heatwaves, highlighting existing inequalities in urban spaces. Cities need robust strategies to adapt to and mitigate the impacts of heat waves. It includes urban planning that incorporates green infrastructure, heat-resilient building designs, and climate-responsive policies, enhancing public awareness and implementing early warning systems can also improve community preparedness.

SDG 15: Combat Desertification and Halt Biodiversity Loss⁸

Heatwaves can lead to drought conditions, water scarcity, and wildfires, imperiling the ecosystem and biodiversity. Additionally, rising temperatures contribute to the melting of glaciers and polar ice caps, leading to an increased sea level and coastal erosion. Protecting natural habitats and promoting sustainable land management practices are crucial to mitigating these impacts and ensuring the resilience of ecosystems.

SDG 17: Global Partnership for Sustainable Development⁹

International cooperation and partnerships are vital to addressing the global challenge of climate change and its impacts. Sharing knowledge, resources, and best practices can help countries develop and implement effective strategies to mitigate and adapt to extreme heat. Strengthening global partnerships is essential to achieving the SDGs and ensuring a sustainable and resilient future for all.

The intricate relationship between heatwaves and the SDGs underscores the need for intersectional, context-specific responses that take into account nuanced impacts on communities and ecosystems. Policy-level interventions must prioritize inclusivity, ensuring that vulnerable populations are protected and empowered. By fostering cross-sectoral collaboration and leveraging innovative solutions, we can mitigate the adverse effects of heatwaves and make significant strides towards achieving the Sustainable Development Goals comprehensively and equitably.

Navigating Gendered Vulnerabilities

The complex interaction of gender dynamics, societal norms, and climate change intensifies the vulnerability of women to heat waves, particularly in India. According to the Food and Agriculture Organization's report, *Unjust Climate*,¹⁰ each year in low and middle-income countries (LMICs), female heads of households in rural areas suffer significantly greater financial losses than men. On average, female-headed households lose 8 percent more of their income due to heat stress.

Another report by the United Nations Human Rights (UNHCR), *Right to Water*,¹¹ women can spend up to four hours daily on water-related tasks, heightening health risks, particularly from waterborne diseases. Additionally, cultural norms frequently downplay women's health concerns, compounding their susceptibility to heat-related illnesses. Furthermore, limited decision-making authority in household and community water management further restricts women's access to crucial resources needed to cope with heat and water shortages. Pregnant and elderly women face elevated risks from heat stress, which can lead to complications such as preterm labor, heightened health conditions, and increased rates of stillbirths.

Economic opportunities for women, particularly in agriculture and informal sectors, are significantly affected by heatwaves and droughts. According to the NITI Aayog, approximately 80 percent of rural women in India are employed in agriculture, and heatwaves coupled with water scarcity jeopardize their ability to engage in farming, particularly tasks such as irrigation. The reduced agricultural yields and biodiversity loss further strain women who rely on subsistence farming or natural resources for their livelihoods.

Around 54 percent of women in India live indoors,¹² which might seem like a potential shelter from extreme heat. However, staying indoors can increase vulnerability because of inadequate ventilation and cooling systems. Research also indicates that higher indoor temperatures decrease women's ability to work effectively, leading to potential income losses of up to 30 percent for those engaged in home-based occupations¹³ in India. Women already earn an average of 20 percent less than men, and this disparity is exacerbated during heatwaves.

Addressing these challenges requires an approach that examines gender sensitivity in policy and planning. It is crucial to ensure women's involvement in decisions concerning community water management and provide them with resources for mitigating heat stress. Health services tailored to meet the specific needs of women during such events are essential. Effective heat action plans and localized water management strategies are crucial at the state, city, and village levels. However, existing Heat Action Plans (HAPs) in India often fail to notice local contexts and to competently address vulnerable populations.

The gender-specific impacts of heat waves and water scarcity in India highlight the pressing need for comprehensive strategies that prioritize the well-being and empowerment of women and girls. Addressing these challenges necessitates a multifaceted approach, integrating gender perspectives into every aspect of climate resilience planning and implementation.

Human Faces of **Extreme Heat**

Palakiya Foundation believes addressing climate change in isolation from social issues is insufficient and ineffective. A just transition to a sustainable future requires dismantling the social and economic inequalities perpetuating environmental harm.

Therefore, our report, “Inferno: The Human Consequences of Rising Temperatures”, is an attempt to provide human faces to the impacts of heatwaves through photo stories. It is a documentation of the daily lives of people living in informal settlements, outdoor workers, street vendors and hawkers, and all other disadvantaged populations who lack the privilege of cooling systems and are left with no alternative but to live and earn in scorching temperatures.



Budhapa, Bimari aur Garmi: Amidst the sweltering heatwave, an elderly heart patient accompanied by his grandsons covers his face with a towel (gamcha). “*Baba ko blood pressure aur heart ki beemari hai, garmi me dikkat aur badh jati hai (My grandfather suffers from blood pressure and a heart patient, extreme heat adds to his deteriorating health conditions),*” says one of his grandsons. Public health experts warn that heat exhaustion may cause circulatory failure and death. Loss of water from the body compounds the heat stress on blood vessels, with an increased propensity for clotting, leading to brain strokes and heart attacks. *Photo: Piyush Singh*



Decline in number of tourists: The iconic India Gate in Delhi usually brimming with domestic and international tourists witnesses a sharp dip in the number of tourists. Consequently, the reduction in tourism significantly impacts the livelihood of street vendors, local eateries hawkers, and freelance tourist photographers causing a noticeable decline in their daily earnings and overall economic stability. *Photo: Piyush Singh*



Chidiya Rani, Waiting for Pani: In the city, caught up with water scarcity and diminishing groundwater levels, a woman takes a moment to pour water into a bowl for birds, offering cool respite. This act of kindness highlights the shared constant struggle of humans and animals as they endure the soaring temperatures. It underscores the importance of community efforts and empathy in helping all living beings survive and thrive through extreme weather conditions. *Photo: Saurav Singh*



Jal Yuddh: The prolonged summertime significantly impact water sources including groundwater leading to severe water scarcity. Several areas in Delhi such as Chanakyapuri's Sanjay Camp, Geeta Colony in East Delhi, Patel Nagar, Mehrauli, and Chhatarpur, witnessed one of the worst water crises this year. Residents in these urban poor pockets of the city, scramble to fill their containers as a water tanker arrives, while the posh pockets are reportedly fined by the municipal corporation for wasting water. *Photo: Mukul Singh Chauhan*



Golgappe or Fulki or Pani Batasha: A street vendor carries a large container of golgappas (a popular street snack that may be called water balls in English) over his head. The vendor, damp with sweat says, *“For the last six years, I have walked past these streets selling golgappas. I am the only earning member in a family of five, daily sales directly impact my family.”* His story is a powerful reminder of how extreme weather affects communities differently. Hence, the most affected are the ones with the least resources. *Photo: Saurav Singh*



The Gig Economy: A group of food delivery men relax in the glass-shielded air-conditioned metro station while they wait for their next order. These youngsters tell us, they are paid a meager 10 to 50 rupees per delivery and on average make around 12 to 20 deliveries each day. Their income minus the incentive that the company pays after completion of the target, ranges from 3600 to 30,000 rupees. While maximum exposure to heatwaves is detrimental to their health, it also reduces the number of deliveries which further leads to a decline in income and impacts their and dependents' lives. According to a report by the University of Pennsylvania, 34.4% of delivery persons earn less than Rs 10,000 after deducting all their monthly expenses. *Photo: Saurav Singh*

Matka or Ghada or Earthen pot or Clay Pot is a container made from natural clay. These pots are widely used for storing water as they naturally cool the water through the process of evaporation. It makes them an excellent choice for the lower and middle-income groups as these pots keep the water cool in high temperatures without the need for refrigeration. Additionally, clay because of its alkaline nature, neutralizes acidity in the body. These pots are one of the many examples of indigenous knowledge that is sustainable and affordable. *Photo: Rohin Kumar*



Ek Glass Pani ki Keemat: A dip in the number of customers coupled with the water crisis leads to a surge in the price per glass of cold water from one to three rupees. These water vending stalls at public places relieve the commuters as well as tourists. “But the blistering heat of sun restricts the number of tourists. Most well-off people prefer buying packaged drinking water bottles than a glass of water from vendors,” says Raja Ram Maurya (43), a migrant worker from Jaunpur, Uttar Pradesh. Photo: Piyush Singh



Aamdani Athanni, Kharcha Sau Rupiya: “Roz 100 rupiya riksha ka bhada dena padta hai. Itni tez dhoop me sawari milna mushkil hai. Shareer jawab de jata hai lekin kya karen? Parivar ko khilana toh hai hi (I have to pay Rs 100 daily as rent for the rickshaw without a miss. It is hard to get passengers in the scorching heat. My health doesn’t allow me to work in this scorching heat but what do we (rickshaw pullers) do? We too have a family to feed),” told Raju Gupta (56), a rickshaw-puller at Chandni Chowk, originally belonging to Kanpur in Uttar Pradesh. Photo: Piyush Singh



Kova Phal: Musahars, recognized as mahadalits, sell ice apples or palm fruits (locally known as Kova) in Bodhgaya, Bihar. The high water content of ice apples helps in keeping the body hydrated and prevents dehydration and heat-related illnesses. *Kova* is an indigenous fruit containing natural sugars, sodium, potassium, and other electrolytes, helping to maintain electrolyte balance in the body and preventing dehydration and heat strokes. These climate-resilient and local food practices and knowledge systems need to be preserved. *Photo: Rohin Kumar*



Subah ko Taazi, Shaam ko Baasi: Santosh Kumar, a vegetable vendor battles the relentless heat daily to keep the veggies fresh. He covers leafy greens and tomatoes with wet jute sacks, and sprinkles water trying to maintain the moisture content and preserve their allure. He says, “We buy fresh vegetables in the morning. It’s hard to keep the veggies fresh by noon. By evening we have to cut the profit margin to clear the stock as no one likes to buy pale vegetables.” *Photo: Rohin Kumar*



D se Dihadi, D se Dhoop: Construction workers, mostly daily wagers, toil with unwavering resolve as they battle deadly heat waves throughout the day to keep up with their families. The working environment at the site doubles their challenges, as they do not have basic water and sanitation facilities. “Since, we mostly work outdoors and to keep ourselves hydrated is a challenge. We do not even find work each day. It is a challenge to afford cooling systems for our rented homes. We cannot even afford refreshing drinks each day.” says a worker. *Photo: Piyush Singh*



Garmi me Khana Kharab Ho Jata Hai: Amid Delhi's relentless heatwave, a lady sits at her open dhaba, a haven of homemade flavors. These dhabas for their low-cost food are the first preference of working class, such as those on daily wages like construction workers, hawkers, street vendors, and other low income groups. The lady says, “Extreme heat spoils the cooked food in a few hours if not consumed. We don't have enough savings to buy a fridge, so we try preparing food in a limited quantity that is consumed by lunch. These days, we have been observing a sharp drop in customers, as most of the workers we hear are suffering from heat strokes, high fever and dehydration,” says the lady.

Photo: Mahima Bansal



Gamcha Meri Pehchan: For north Indians, *Gamcha* (a cotton towel) makes an essential kit in summers to protect their head, face, and skin from direct sun rays. With the advent of industries, large machines have reduced the number of workers and increased the production manifolds. Gaya, recognized as Manchester of Bihar for its traditional textile industry, has a few handloom machines and workers left that produce original cotton *gamchas*. Indeed *gamchas* are community practices towards climate adaptation and resilience. *Photo: Mahima Bansal*



Sharbat da Bhalla: The community comes together to offer Sharbat to outdoor workers and commuters. Sharbat is an excellent source of hydration. The varied combinations of water with sugar, salt, mint, rose, jaggery, lemon, ginger, cucumber, herbs etc helps maintain electrolyte balance, plus it is rich in vitamins, minerals, and antioxidants. Sharbat also has deep cultural roots often associated with hospitality and tradition. Serving Sharbat to guests symbolizes warmth and welcome.

Photo: Piyush Singh



Kartavya Nishtha: “It’s hard to function outdoors in this tormenting heat but the nature of our job is to be outdoors. Last week the shade of the guard home was blown by harsh winds, I have made the complaint but the company is yet to repair it. To beat the heat, I try keeping myself hydrated,” Ankit, a private security guard posted at Kartavya Path, New Delhi narrates his daily face off with ongoing severe heat waves. “Even packaged water is costly these days, costs 20 to 30 Rs per liter,” he adds.
Photo: Piyush Singh

Recommendations

Many countries, cities, and communities are taking steps to manage and prevent the impacts of extreme heat. These responses can be categorized into - one, advancing preparedness, and two, improving heat interventions. While investing in vulnerability assessments and research to inform risk management and improve local responses to heat waves is required, it is equally essential that cross-sectoral collaboration and investment in training and capacity building for health officials and health workers, ranging from national health ministry officials to hospital staff, ambulance providers, health clinic staff and emergency management authorities. Hence, the following recommendations:

Heat Action Plans (HAPs)¹⁴

- Heat Action Plans must be coordinated with governments, health agencies, and community organizations to prepare for, respond to and recover from heat-related events.
- Heat Action Plans must analyze annual heatwave responses and add progressive interventions accordingly. It helps in improving preparedness through early planning and resource allocation.
- Targeted interventions should be developed to protect vulnerable populations, with a focus on localized adaptation, swift implementation, and prioritizing the safety of heat-sensitive groups.
- Economic packages for outdoor workers must be prioritized as they lose productivity during extreme weather events such as heatwaves.

Early Warning Systems¹⁵

- The Indian Meteorological Department (IMD) must develop localized forecasting systems tailored to the climate and needs of diverse localities.
- Cities must establish localized Automatic Weather Stations (AWS) networks to supplement IMD advisories, providing hyperlocal weather information for targeted advisories and urban planning.
- SMS, local radio, and community loudspeakers must be utilized to disseminate warnings broadly so that information reaches all demographic groups and optimizes preparedness.

Infrastructure, Training and Public Awareness:

- Healthcare facilities must be well-equipped to manage heat-related illnesses with adequate staffing, cooling devices, hydration facilities, and emergency services.
- All healthcare workers must be given comprehensive training to effectively identify, treat and manage heat-induced health issues to effectively identify, treat, and manage heat-induced health issues.
- Public Awareness campaigns on hydration, recognizing early signs of heat-related illnesses and advisories to stay indoors during peak heat must be done through communication channels for broad reach.

Community-level interventions:

- Indigenous knowledge systems including reviving traditional and local food that have rich electrolyte balance must be encouraged to be consumed.
- Drinking water facilities, be it clay pots or water coolers should be installed for outdoor workers and commuters so that no one is deprived of the drinking water.
- Cool centers or shaded spaces in public buildings should be designated to provide a safe environment with cooling systems, hydration, and access to heatwave information and medical attention.

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About Us

Palakiya Foundation through its research, campaign, advocacy and action focuses its work on climate and its intersections. It aims at co-empowering those pushed at the margins and whose voices and experiences have been unheard. The Foundation's research and experimental development services ensure policy-level interventions in various demographics and geographies.



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