

Extreme Heat in Nepal: Risks and Response



Heatwaves are increasingly being recognized as a hazard that requires significant attention from Nepal's national and provincial governments and from other key stakeholders. This policy brief highlights the growing risk of heatwaves in Nepal, with rising temperatures posing a mounting threat to public health, livelihoods, and the most vulnerable communities. The brief sets out the urgent, coordinated action required to reduce these risks and to build long-term resilience to them.

Key priorities for action include the development of localized data collection and early warning systems and the implementation of adequately funded preparedness and response mechanisms at every level of government.

SUMMARY RECOMMENDATIONS

- The National Disaster Risk Reduction and Management Authority (NDRRMA), in coordination with the Department of Hydrology and Meteorology (DHM) and sectoral agencies, should facilitate the development of a robust data collection and data sharing mechanism to record and forecast high temperatures and their impacts at local, provincial, and national levels. This mechanism should be integrated into the Building Information Platform Against Disaster (BIPAD) portal. To achieve this, there is a need to put in place a dense network of weather stations, which can provide reliable, accurate, and localized information.
- The DHM, supported by the NDRRMA, should further strengthen capacity within both national, provincial and local governments to analyse the available temperature data, identify key indicators of heatwaves, and provide clear guidance for different sectors on both preparedness and response.
- The NDRRMA, in partnership with municipalities and provincial governments, should continue to produce localized heatwave risk reduction and response plans and ensure that these plans define clear roles, responsibilities, and accountability structures across different sectors.
- Governments at all levels should allocate pre-approved, dedicated resources to fund preparedness and response to extreme heat events, including expanding the use of the Disaster Management Fund to cover both preparedness and response to multiple hazards.

RISING TEMPERATURES

As the climate crisis leads to more frequent extreme weather events, the greatest burden falls on those communities that have contributed the least to the problem. Across Nepal, people are already facing the consequences of a crisis they did not cause: they are grappling with flooding, extreme heat, and mounting pressure on crops and livestock. Temperatures in Nepal are on the rise, with heatwaves predicted to impact large parts of the country every year.

DEFINING EXTREME HEAT

While there is no universally fixed definition of extreme heat, as it is relative to the climate in a particular context, a heatwave is generally characterized by unusually high temperatures that are sustained for at least two to three days, often with discernible impacts on human and natural systems. In Nepal, the DHM defines a heatwave as a maximum temperature that exceeds the 95th percentile of the average maximum temperature for three consecutive hot days.]

In addition to increasing average temperatures, the number of extremely hot days in Nepal is likely to increase significantly, from 36 to 60–68 days each year, according to the Government of Nepal (Ministry of Forests and Environment, 2019).

In both Madesh and Sudurpaschim provinces, the number of extremely hot days is projected to increase by 5–8% even in a scenario where the average temperature rise is moderate (DHM, 2024a). While this shift will have far-reaching effects across a number of sectors, including education, agriculture, transport, and tourism, some of the most extreme impacts of heatwaves will be on people's health. The figure below illustrates potential heatwave threshold temperatures and their corresponding risk levels.

Table 1: Potential threshold temperatures for heatwaves across multiple geographies (in degrees Celsius)

Geographical area	Threshold temperature (°C)				
	Hot day	Light heatwave	Moderate heatwave	High heatwave	Extreme heatwave
	Caution level	General awareness level	Alert level	Warning level	High risk level
Tarai and Inner Tarai	27	32	35	38	40
Chure	27	30	34	36	38
Mid and High Mountain	27	28	32	34	36

Source: Developed by the author using data compiled from NOAA, DHM, the World Health Organization, the World Meteorological Organization, and the UK Met Office.





THE RISKS

Heatwaves intensify health, economic, and environmental vulnerabilities. Their consequences range from power shortages and reduced agricultural outputs to serious health issues, including diarrhoea, indigestion, heart attacks, and even increased incidence of conditions such as asthma and diabetes. Between 2000 and 2019, the World Health Organization estimated 489,000 heat-related deaths occurred each year worldwide. As record-breaking temperatures continue to occur across the globe, extreme heat is expected to surpass critical health thresholds more frequently under a 2°C warming scenario (Dosio et al. 2018). Under these conditions, more than a third of the world's population could be exposed to extreme heat (Dosio et al., 2018). This is of particular concern for Nepal, where extreme temperatures are already regularly surpassing 40°C.

Although Nepal lacks comprehensive data on heat-related fatalities, the threat posed by increased incidence of heatwaves cannot be ignored. In recent years, extreme heat has led to a sharp rise in hospital admissions, with frequent reports of students collapsing in classrooms due to heat exhaustion and dehydration.

Rapid urbanization, combined with heat-retaining infrastructure, can cause temperatures to be 5–10°C higher in urban settings than in surrounding rural areas, with the largest differential occurring at night (World Meteorological Organization,

n.d.). In 2024, temperatures exceeded 36°C in all major cities of Madhesh Province. The picture in Sudurpaschim Province looks similarly concerning. In Attariya, temperatures reached between 40 and 44°C for several days in 2024, with record highs recorded in May of that year across Attariva, Tikapur, Gothalapani, and Baitadi. Urban heat islands can negatively affect livelihoods and rainfall patterns, worsen air pollution, and exacerbate health harms and socioeconomic inequalities.

While urban areas tend to experience higher temperatures, rural areas face distinct vulnerabilities to extreme heat. These include limited access to essential services such as hospitals and cooling stations, demographic factors like older populations, a high prevalence of outdoor work, and limited access to electricity and air conditioning. Together, these factors significantly heighten the vulnerability of rural populations during heatwaves.

As with many climate-related impacts, vulnerable groups are more susceptible to heat stress, including senior citizens, children, and pregnant and breastfeeding women. For example, exposure to extreme heat has been associated with pre-term birth, poor maternal health, and other complications during pregnancy. Moreover, heat significantly affects unpaid domestic labour, particularly the unpaid care work linked to heat-related illnesses, which falls disproportionately on women; this exacerbates gender inequalities and leads to lost productivity during peak temperatures.

The impacts of extreme heat are also felt disproportionately by workers who work in environments that are ill-equipped for, or particularly exposed to, extreme heat: for example, in the open air or under corrugated iron roofs. For the many families who are dependent on daily wage labour, avoiding dangerous working conditions during very hot days is not an option.

POLICY RECOMMENDATIONS: OPPORTUNITIES AND GAPS

Although heatwaves have yet to be identified as a priority hazard in Nepal and remain under-prioritized compared to floods and landslides, due to their slow onset and less visible impacts, measures to address extreme heat such as early warning bulletins do feature in the policy architecture, including the Hydrology and Meteorology Policy (DHM, 2024b).

The rapidly changing climate in Nepal requires a comprehensive and far-reaching response. It is essential for both government and non-governmental actors, from the local to the national level, to take coordinated measures to mitigate the impacts of extreme heat. These measures should include the following:

Develop a localized, context-specific early warning system for heat: While the DHM currently issues early warning bulletins and forecasts, these efforts have not so far sufficiently equipped impacted communities to prepare for and respond to instances of extreme heat. The Hydrology and Meteorology Policy (DHM, 2024b) outlines a commitment to establish and operate weather stations at the municipal level in collaboration with local governments. This is a welcome step towards strengthening early warning systems for extreme weather-related events, including heatwaves, and ensuring the availability of reliable, localized weather information across the country. However, implementation remains lacking.

Local and provincial governments often lack the adequate and skilled human resources necessary to interpret weather information, assess the potential impacts, and translate this analysis into timely and actionable guidance. A localized, context-specific early warning system should be developed: this should involve determining the threshold temperature for different levels of heatwaves corresponding to risk levels.

Issue sector-specific advisories: Early warning systems should also issue guidance for specific sectors, as has proven effective in flood risk management. In the case of heavy rainfall, the DHM not only provides flood warnings but also issues sector-specific advisories, such as sharing advice on how the agricultural sector can protect their crops. A similar approach should be adopted for extreme heat. The NDRRMA should strengthen capacity at all levels to support the production of localized and decentralized heatwave risk reduction and response plans, and should ensure that these plans define clear roles, responsibilities, and accountability structures across different sectors. The Nepalgunj Heat Action Plan (Subedi et al., 2023) provides an illustrative example of a framework for implementing, coordinating, and evaluating extreme heat action across Nepal: it provides a roadmap for actions to be taken by local governments and other stakeholders before, during, and after the hot season.

Allocate pre-approved, dedicated resources to fund preparedness for and the response to extreme heat: One of the key challenges is the availability of adequate resources to fund both preparedness and response efforts – particularly for scaling up the capacity to collect, analyse, and disseminate weather information. Ultimately, the effectiveness of any disaster risk financing strategy rests on its ability to secure the resources needed for implementation. In Nepal, this challenge will only continue to grow as extreme heat events become more frequent and severe.

The existing Disaster Management Fund, which is frequently used to respond to climate shocks such

as floods, should be expanded to include heat-related hazards and to support multi-hazard preparedness and response. Given that extreme heat is rapidly becoming a recurring issue, the Fund should also be replenished on an annual basis.

Introduce targeted measures to reduce the impact of extreme heat on the most vulnerable populations. One model that should be considered is heat insurance schemes for workers who are ill-equipped to face the effects of extreme heat, or who are particularly exposed to them. An insurance scheme for workers who are dependent on a daily wage could provide an incentive for them to stay at home on days when exposure would be dangerous, by replacing wages lost during a heatwave. Similar strategies should be urgently explored for other vulnerable populations, including children and the elderly.

With rapidly increasing temperatures and the number of extremely hot days on the rise, the health and livelihoods of Nepal's most at-risk individuals and communities will be increasingly threatened. While policies acknowledging the growing risk of extreme heat are a positive step, urgent action is needed to operationalize these commitments, scale up interventions, localize responses, and ensure there is adequate funding to protect the most affected.

For more details, see the separate reports prepared for Sudurpaschim and Madhesh provinces. [add link]

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Members of the Zurich Climate Resilience Alliance are funded by the Z Zurich Foundation, with the exception of Zurich Insurance Group. However, the views expressed in this publication do not necessarily reflect the official position of either the Foundation or the company.

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