

Report | October 2026

Living with Heat in Nepal

Authors

Anushka Goswami
Shruti Nikhar
Shravan Prabhu
Vishwas Chitale

Heat-health Risks, Vulnerability, and
Emerging Responses





Copyright © 2026 Global Heat Health Information Network (GHHIN).

Open access. Some rights reserved. This work is licensed under the Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) license. To view the full license, visit: www.creativecommons.org/licenses/by-nc/4.0/legalcode.

Suggested citation:	Global Heat Health Information Network South Asia Hub. 2026. <i>Living with Heat in Nepal: Heat-health Risks, Vulnerability, and Emerging Responses</i> .
Disclaimer:	The views expressed in this report are those of the authors and do not reflect the views and policies of the Global Heat Health Information Network South Asia Hub.
Cover and back images:	iStock. Outdoor portrait of a Nepali woman in daylight. For illustrative purposes only.
Peer reviewers:	Ramiz Khan, Urban Advisor, Red Cross Red Crescent Climate Centre; Sneha Sanjel, Consultancy Delivery Responsible, Practical Action, and Sambaddha Pradhan, PAC Business Head, Practical Action.
Publications team:	Purnima P. Vijaya (CEEW); Alina Sen (CEEW); The Clean Copy; Twig Designs, and FRIENDS Digital Colour Solutions.
Acknowledgment:	We would like to express our sincere gratitude to all individuals and institutions who contributed to this project at various stages. We extend our sincere thanks to Dr Roxy Mathew Koll from IITM for his valuable insights and contributions. We also gratefully acknowledge the Practical Action team, particularly Arunabha Bhattacharya, and Rakesh Supkar, for their valuable inputs and support on Nepal's heat landscape. We further acknowledge the support and insights from Aditya Bahadur of the Red Cross Red Crescent Climate Centre. We would like to acknowledge Diti M. for her support during the preparation of this report. We also extend our appreciation to the GHHIN team, particularly Dr Joy Shumake-Guillemot, Alejandro Saez Reale, and Dr Shreya Shrikhande, for their continued guidance and support throughout the project.
Organisations:	The Global Heat Health Information Network (GHHIN), established by WMO, WHO, and NOAA, brings together policymakers, scientists, and practitioners to strengthen global action on heat and health. The GHHIN South Asia Hub, hosted by the Council on Energy, Environment and Water (CEEW), along with its partners the Natural Resources Defense Council (NRDC), the Sustainable Futures Collaborative (SFC), the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), and BRAC James P. Grant School of Public Health (BRAC JPGSPH), was established in April 2026 to translate global knowledge into context-specific solutions across South Asia. Aligned with GHHIN's goals to Connect, Accelerate, and Catalyse, the Hub supports knowledge exchange, capacity building, research, and policy action on heat and health, with a focus on vulnerable communities.

GHHIN South Asia Hub Secretariat:

Council on Energy, Environment and Water

ISID Campus, 4 Vasant Kunj Institutional Area

New Delhi – 110070, India

+91 11 4073 3300

info@ceew.in | ceew.in |  @CEEWIndia |  ceewindia

Living with Heat in Nepal

**Heat-health Risks,
Vulnerability, and Emerging
Responses**

Report | October 2026

Anushka Goswami, Shruti Nikhar,
Shravan Prabhu, and Vishwas Chitale

About Global Heat Health Information Network South Asia Hub

The **Global Heat Health Information Network (GHHIN)**, established in 2016 by the **World Meteorological Organization (WMO)**, the **World Health Organization (WHO)**, and the **US National Oceanic and Atmospheric Administration (NOAA)**, is a key platform for strengthening global collaboration on heat and health. The GHHIN is a voluntary, multidisciplinary community of policymakers, scientists, practitioners, and institutions that provides science-based thought leadership and builds consensus among diverse actors with shared values. It aims to accelerate heat action by fostering partnerships, advancing evidence and actionable knowledge, developing standardised guidance and risk metrics, and catalysing policy and action at the global, national, and local levels to minimise the societal consequences of extreme heat. Through global and regional forums, knowledge exchange, training, collaborative research, and the development of tools and guidance, GHHIN supports governments, organisations, and professionals in translating scientific evidence into practical action to **protect communities from the avoidable health risks of extreme heat**.

Recognising the need to translate global knowledge and collective action on heat and health into context-specific solutions, the **Council on Energy, Environment and Water (CEEW)**, along with its partners, the **Natural Resources Defense Council (NRDC)**, the Sustainable Futures Collaborative (SFC), the **United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)**, and the **BRAC James P. Grant School of Public Health (BRAC JPGSPH)**, was selected to host the **GHHIN South Asia Hub**, established on 7 April 2026. The Hub works in tandem with the **South Asia Climate and Health Desk**, hosted by the **Indian Institute of Tropical Meteorology (IITM)** and the India Meteorological Department (IMD), to ensure that early heat warnings and scientific evidence inform effective solutions for communities.

Hosted by **CEEW in New Delhi**, the Hub is directly aligned with GHHIN's global goals of **connecting, accelerating, and catalysing action**. It provides the region with a shared platform for exchanging knowledge, shaping policy, and building capacity on heat and health. The Hub brings together practitioners, policymakers, and researchers from governments, academia, and civil society to facilitate **coordinated and evidence-based action on heat risks**, particularly among communities facing the greatest exposure (GHHIN and CEEW 2026).

This country synthesis report is one of the key knowledge products produced by the GHHIN South Asia Hub. Other knowledge products can be accessed here: <https://heathealth.info/southasia/>

Contents

Section	Pg
Executive summary	1
1. Introduction	4
2. Heat risk in Nepal	5
2.1. Historical trends in extreme heat	5
2.2. Spatial distribution of heat risk across Nepal	6
2.3. Future projections and assessment	8
2.4. Socioeconomic drivers of heat vulnerability in Nepal	10
3. Policy and institutional mechanisms to mitigate heat risk	11
3.1. Evolution of heat risk governance in Nepal	12
3.2. Heat-related health risks and preparedness	13
3.3. Extending forecasting capacities and the early warning system	16
4. Non-government and community-oriented solutions	17
4.1. Red Cross heat action initiatives in Nepal	17
4.2. ZCRA's work in Nepal	19
4.3. Resilience, Adaptation, and Inclusion (RAIN) programme in Nepal	20
5. Conclusion	22
Acronyms	23
References	25
Authors	30

Executive summary

The increasing frequency, intensity and duration of extreme heat events have emerged as a global climate, health and development challenge, with impacts shaped by levels of exposure, socioeconomic conditions and access to health and social protection. This global warming trend provides important context for understanding Nepal's changing climate risks: the World Meteorological Organization confirms that 2015–2025 were the 11 warmest years on record, with 2025 approximately 1.43°C above the 1850–1900 average (WMO 2026). Against this backdrop, Nepal is experiencing rising temperatures and more frequent episodes of extreme heat, with risks varying across its diverse climatic zones and populations. In the high mountains, warming is also contributing to glacier retreat and the expansion of glacial lakes (Khadka et al. 2023). Understanding these changing patterns of climate risk, and the factors shaping vulnerability across populations and places, is therefore critical to strengthening climate and heat-health action in Nepal.

As part of GHHIN South Asia Hub's knowledge products, this country synthesis examines heat risks in Nepal through four interconnected dimensions. It first assesses historical and projected heat trends and the spatial distribution of heat risk across the country. It then examines how socioeconomic conditions shape vulnerability to heat, before reviewing Nepal's policy and institutional mechanisms for addressing heat risk. Finally, it highlights non-government and community-oriented solutions being implemented on the ground, offering insights into emerging approaches to strengthen heat resilience.

Key findings

- 1. Nepal is facing both chronic and acute heat stress.** Across 46 meteorological stations in Nepal, maximum temperatures rose by roughly 0.04°C per year between 1980 and 2016, while minimum temperatures rose by 0.02°C per year, with the strongest warming observed in the mountains and during the pre-monsoon season. The number of warm days increased by 13 per decade and warm nights by 4 per decade (Karki et al. 2020). Nepal also experiences a pronounced north–south temperature gradient: annual average maximum temperatures exceeded 30°C across the southern Terai in 2024, but remained below 9°C in the north. In 2025, Lahan station in Siraha recorded the country's highest annual average maximum temperature, at 32.6°C (DHM 2024b; DHM 2026a). Recent data also indicate an increase in the frequency and duration of extreme heat events. In 2024, the Terai recorded 50 extremely hot days with temperatures above 40°C, with heatwave spells lasting 5–17 days. In 2025, it recorded 22 such days and heatwave spells lasting 3–6 days (DHM 2025; DHM 2026a). The trends highlight that Nepal, once a country affected largely by hydrometeorological disasters, is also facing heat related hazards in recent decades.
- 2. Projections show increasing heat risk.** Nepal's *National Adaptation Plan* (NAP) projects a 1.5–1.6°C increase in mean annual temperature for 2021–40, 2.0–2.4°C for 2041–60, and 2.7–4.4°C for 2081–2100, depending on the emissions pathway (MoAFE 2021). More recent Department of Hydrology and Meteorology (DHM) scenarios model temperature increases of up to 4.5°C under SSP2-4.5 and up to 7°C in some areas under SSP5-8.5, with the high Himalaya experiencing the fastest warming (DHM 2024c). Projected increases in monsoon rainfall, combined with higher temperatures, could increase humidity and compound heat stress in regions such as the Terai, where exposure is already high.
- 3. Vulnerability is determined by more than temperature.** In 2021, just 53.1 per cent of Nepali households owned an electric fan, 23.7 per cent a refrigerator, and 37.7 per cent had internet access, 4.5 per cent of households had no access to a toilet (NSO 2023). About 66 per cent of the population is engaged in agriculture, which accounts for roughly a third of the country's gross domestic product (GDP) (FAO 2026). The sector is also projected to experience significant heat-related productivity losses: ILO projects productivity losses equivalent to 391,000 full-time jobs by 2030, up from 106,000 in 1995 (ILO

2019). Outdoor workers routinely work in ambient temperatures of 36–39°C with high humidity. This results in increasing the risk of heat-related illness two- to threefold (Venugopal et al. 2021; Sharma et al. 2025). Residents of informal settlements, marginalised communities, and households without access to water, healthcare, or cooling bear the heaviest burden (Giri et al. 2021).

4. **The health burden of heat stress is high.** In Nepalgunj, where the maximum heat index remained in the ‘Danger’ category (41–54°C) from May to September 2019, more than 60 per cent of surveyed residents reported heat-related symptoms, ranging from headaches and cramps to hyperthermia, unconsciousness, and seizures. However, only 14.3 per cent sought care at a health facility (Bhatta and Pahari 2021). Nepal’s principal sentinel surveillance system, the Early Warning, Alert and Response System (EWARS), covers six communicable diseases and syndromes but does not monitor heat-related illnesses. There is also no established system for recording heat-related mortality (Dhimal et al. 2018). Consequently, facility-based data alone may underestimate the overall burden of heat-related illness and mortality in Nepal. Strengthening heat-health surveillance is therefore important to capture cases that may not reach health facilities, identify populations and locations experiencing disproportionate impacts, and generate timely evidence to inform heat-health action plans, early warning systems and targeted public health interventions.

Nepal’s Terai recorded 50 extremely hot days in 2024, with heatwaves lasting up to 17 days.

5. **Institutions are responding with plans and policies, but implementation remains uneven.** Nepal has made progress in developing institutional responses to extreme heat: the National Disaster Risk Reduction and Management Authority (NDRRMA) issued the country’s first federal heat plan in 2024 and a broader, more anticipatory national plan covering extreme heat and drought in 2026 (NDRRMA 2024, 2026a). The DHM operates a forecasting system based on the Weather Research and Forecasting (WRF) numerical weather prediction

model, initialised four times daily, which features tiered heatwave alerts and special bulletins for extreme heat (DHM n.d.c.). However, this forecasting capacity is not complemented by corresponding health surveillance and local response systems. Nepal’s routine health surveillance does not systematically capture heat-related illness, and no systematic heat early warning system reaching all vulnerable groups is yet in place (Dhimal et al. 2018; Khan et al. 2026). This gap between forecasting capacity and downstream health and local response systems presents a key challenge for heat governance in Nepal. Technical expertise, financing, and access to climate finance remain concentrated at the federal level, limiting what the 7 provincial and 753 local governments can deliver (Khatrri et al. 2022).

6. **Heat responses are being implemented at the ground level.** Three documented initiatives of locally grounded heat response include:
 - **The Nepal Red Cross Society (NRCS)** works across Nepalgunj, Siddharthanagar, Biratnagar, and Dhangadhi, reaching about 880,000 people through public awareness campaigns and around 4,400 through household visits, health checks, and drinking-water stations. As part of its heat-risk reduction interventions, NRCS supported the installation of cool roofs in 14 households and two schools, and technical support underpinned heat action plans (HAPs) in three cities (NRCS 2025).
 - **The Zurich Climate Resilience Alliance (ZCRA)**, through Practical Action and Mercy Corps, supported Madhesh Province and five municipalities in committing 5 per cent of sectoral budgets to adaptation and disaster risk reduction, informed by resilience assessments conducted in 57 communities in 13 municipalities. A 2025 Mercy Corps study covering 347 public schools in Madhesh provided evidence of heat impacts in Nepali schools. It identified 202 schools as highly vulnerable and documented existing coping measures and preparedness gaps, providing evidence to inform targeted interventions in school infrastructure, heat preparedness and local planning (ZCRA 2025; Mercy Corps 2025).

- **The Resilience, Adaptation, and Inclusion (RAIN) programme in Nepal** piloted a heat early action standard operating procedure (SOP) in Gaur, Jaleswor, and Siraha in June 2025, using locally derived 95th-percentile temperature thresholds of 38.5°C, 38.1°C, and 36.5°C. It provided hydration stations for more than 17,500 outdoor workers and door-to-door health advice to over 1,800 people through female community health volunteers, as well as risk communication via local-language radio and mural art (Neupane 2025; People in Need 2025).

What Nepal needs next to be heat resilient

Nepal needs to shift from a largely reactive response to extreme heat to a more proactive, integrated and inclusive approach to heat-health action. This requires strengthening institutional preparedness across levels of government while ensuring that interventions respond to the differing risks faced by populations and places. The report highlights five priorities.

1. **Strengthen heat-health surveillance.** The Ministry of Health and Population, working with the DHM, can strengthen routine reporting of heat-related morbidity and mortality, beginning with the mandatory recording of heat-related admissions at Terai district hospitals during the pre-monsoon and monsoon months. Systematic reporting will help identify populations and locations experiencing higher health impacts and generate evidence to guide targeted interventions.
2. **Integrate heat-health surveillance into the early warning system.** Heat-health surveillance data can be linked with meteorological forecasts and locally derived heat-health thresholds to

strengthen Nepal's early warning system. This integration can enable authorities to assess emerging health risks, identify hotspots, and trigger timely, evidence-based public health interventions.

3. **Strengthen local capacity and coordination for heat action.** As local governments play a critical role in disaster risk management and service delivery, building their technical and institutional capacity is essential. Establishing clear roles and coordination mechanisms across meteorological, health, disaster management, and local government agencies can support the development and implementation of locally tailored heat-health action plans.
4. **Mainstream heat risk across sectors.** Heat-health considerations need to be extended beyond seasonal heatwave responses and be integrated into health-system preparedness, urban planning, workplace safety, and disaster risk management. This can help address the underlying drivers of heat exposure and reduce risks through measures such as improved access to cooling, heat-resilient public spaces, and safer working conditions.
5. **Apply a differential vulnerability lens to heat-health action.** Heat impacts are not experienced uniformly. Policies and interventions should prioritise groups facing higher exposure or limited capacity to adapt, including outdoor and informal-sector workers, low-income households, and communities in heat-prone areas. Nepal's *Female Community Health Volunteers* (FCHVs) network, with over 50,000 volunteers in every ward, offers an effective channel for reaching households and generating evidence on gender, livelihoods, and access to resources at the local level (MoHP 2025).

Proactive heat-health action requires stronger surveillance, local capacity, cross-sector coordination and targeted protection for vulnerable populations.

The GHHIN South Asia Hub can support these priorities by convening stakeholders, strengthening the regional evidence base, facilitating knowledge exchange, and building capacity for heat-health action. This can help Nepal translate emerging evidence into practical, scalable, and context-specific approaches to reducing the health, livelihood, and socioeconomic impacts of extreme heat.

1. Introduction

Extreme heat is increasingly recognised as a major, multifaceted climate risk worldwide, affecting public health and productivity. The increasing frequency, intensity, and duration of extreme heat worldwide are largely driven by rising global temperatures, while the associated risks are driven by rapid urbanisation and existing health vulnerabilities and socioeconomic inequalities. The warming signal is unambiguous. The global mean temperature for January–August 2025 stood at 1.42°C ($\pm 0.12^\circ\text{C}$) above pre-industrial levels, and each of the 11 years from 2015 to 2025 is set to rank among the 11 warmest in the 176-year observational record (WMO 2025). Since the 1990s, heat-related deaths have increased by 63 per cent, averaging 546,000 deaths per year during the period 2012–21 (Romanello et al. 2025). Under current policies and given near-term trajectories, exceeding 1.5°C of global warming is now widely considered unavoidable. However, the magnitude and duration of this overshoot remain contingent on the pace and scale of mitigation and adaptation action (UNEP 2026).

Cities in Asia, particularly Southeast Asia, are increasingly exposed to hazardous humid extreme heat events (Agarwal et al. 2024). By 2070, around 520 million people across the region may experience at least one month of dangerous heat each year. The risk is particularly pronounced in cities, where dense urban areas may remain more than 10°C hotter at night than the surrounding countryside, intensifying heat exposure and limiting overnight recovery (World Bank 2026). Under a 1.5°C warming scenario, South Asia could lose 5.3 per cent of total working hours to heat stress by 2030, equivalent to approximately 43 million full-time jobs (ILO 2019). In India, one of the

Extreme heat is intensifying across Asia, amplifying health risks, productivity losses, and socioeconomic vulnerabilities (Agarwal et al. 2024; ILO 2019).

largest and most populous countries in South Asia, 57 per cent of Indian districts, home to nearly three-quarters of the population, already face high to very high heat risk, according to research by the Council on Energy, Environment and Water (CEEW) (Prabhu et al. 2025). Similarly, Bangladesh has experienced a 1.1°C increase in the average annual maximum temperature since 1980, while feels-like temperatures have risen by 4.5°C, contributing to growing physical and mental health burdens, including heat-related anxiety and depression (World Bank 2025).

Rising global temperatures have accelerated changes in the cryosphere, particularly in high-mountain regions, leading to reductions in snow cover, glacier retreat, and permafrost degradation (IPCC 2019). In the Himalayan countries of Nepal and Bhutan, warming has contributed to rapid cryospheric changes, including glacier retreat, declining snow cover, and permafrost degradation, which threaten water security, ecosystems, and mountain livelihoods (IPCC 2022). Alongside these chronic impacts on mountain ecosystems, low-lying areas of these high-altitude countries are increasingly experiencing extreme heat, with temperatures in some areas now regularly exceeding 40°C (Bhandari et al. 2025).

2. Heat risk in Nepal

Rising temperatures are making extreme heat a growing concern across Nepal. This chapter characterises how that risk is evolving across the country, drawing on long-term meteorological records and recent observational evidence. It assesses historical trends in temperature and heatwaves, how exposure varies across Nepal's physiography from the high mountains to the densely populated Terai, and the projected changes and socioeconomic factors that shape vulnerability. Together, these strands establish where heat risks are concentrated, who is most exposed, and where heat-health action may need to be prioritised.

2.1. Historical trends in extreme heat

Nepal spans an exceptional climatic range, from subtropical to alpine, and faces a severe multi-hazard risk shaped by steep Himalayan terrain, active seismicity, and intense monsoon rainfall. Its mountainous topography has historically made cold-related hazards the dominant concern. However,

over the past two decades, extreme heat has emerged as an increasingly significant climate risk. Rising temperatures, combined with more frequent and prolonged heatwaves and rapid urbanisation, have heightened heat exposure across the country, particularly in the Terai, Nepal's southern lowland plain extending along the border with India as part of the Indo-Gangetic Plain. Its low elevation, hot and humid climate, and dense population contribute to high exposure to extreme heat.

Nepal faces both chronic and acute heat stress. The Department of Hydrology and Meteorology (DHM) categorises heatwaves into three levels based on local temperature thresholds: mild, moderate, and extreme heatwaves, corresponding to maximum temperatures exceeding the 90th, 95th, and 99th percentiles, respectively, for three or more consecutive days (DHM 2024b; IFRC 2025). Long-term observations from 46 meteorological stations between 1980 and 2016 show a consistent warming trend across Nepal, with maximum and minimum temperatures increasing by approximately 0.04°C and 0.02°C per year, respectively. Warming was more pronounced in the mountains than in the valleys and lowlands, and during the pre-monsoon season than during the rest



Agriculture engages around 66% of Nepal's population, leaving many outdoor workers exposed to extreme heat.

of the year. Warm days increased faster than warm nights, by 13 and 4 days per decade, respectively (Karki et al. 2020).

Recent years illustrate the impacts of this warming. In 2024, the southern Terai plains recorded 50 extremely hot days above 40°C, with heatwave spells lasting 5–17 days between April and June (DHM 2025). In 2025, several Terai stations again exceeded 40°C between March and June, recording 22 extremely hot days and heatwave spells lasting 3–6 days, primarily between April and June (DHM 2026a). Temperatures remained above normal through March–July 2026, with the Terai again among the most affected regions (DHM 2026b).

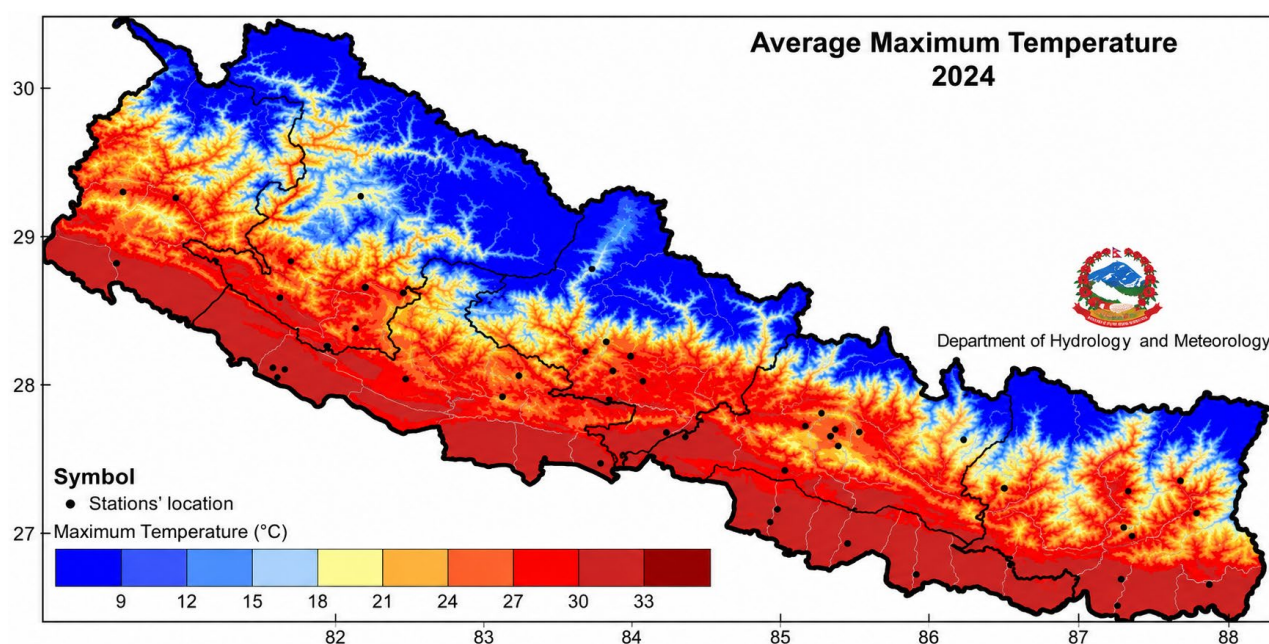
Although heat has historically received less policy attention than hazards such as floods and landslides, growing scientific evidence and recent government initiatives indicate that extreme heat is emerging as a significant public health and development concern in Nepal (MoAFE 2021; Dhimal et al. 2018). Nepal's *National Adaptation Plan (NAP)* (2021–50) recognises rising temperatures and increasing climate extremes as major threats to public health, agriculture, urban development, and water resources. It identifies Terai as one of the country's most climate-sensitive regions

and calls for stronger climate information services, early warning systems, and climate-resilient urban planning (MOAFE 2021).

2.2. Spatial distribution of heat risk across Nepal

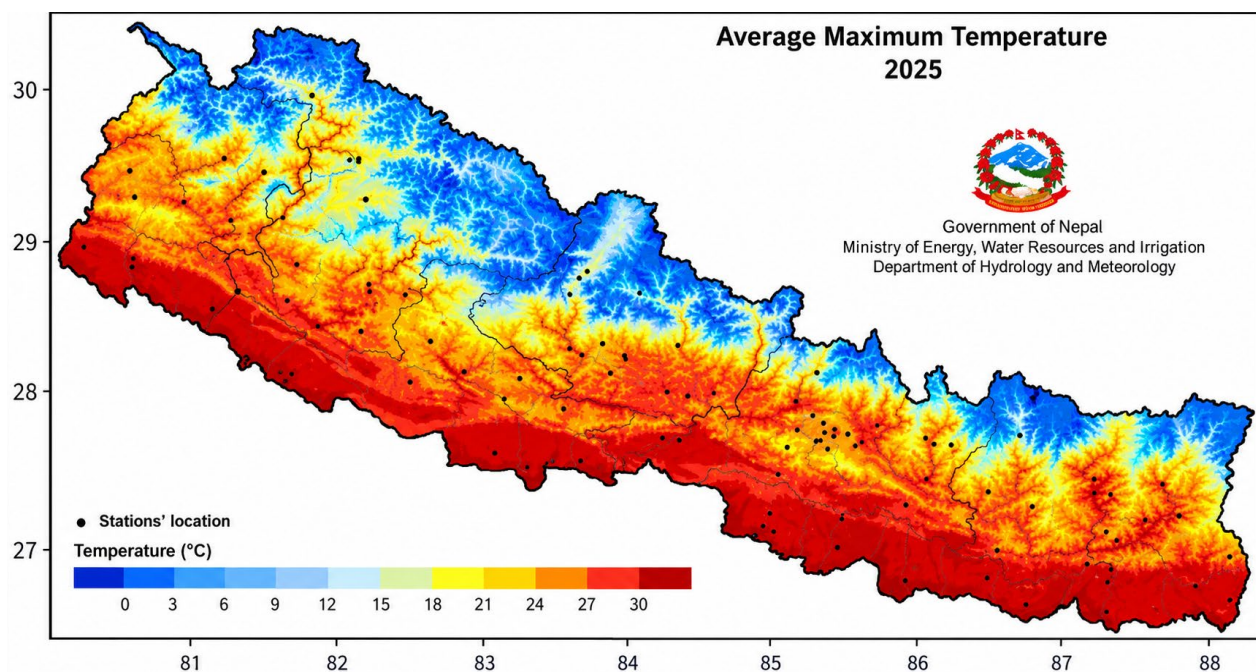
Nepal has a pronounced north–south temperature gradient, with substantially warmer conditions in the southern Terai than in the northern highlands. However, recent observations show that elevated temperatures are not confined to the Terai, with above-normal temperatures recorded across much of the country. According to DHM's *State of the Climate of Nepal 2024*, the average annual maximum temperature in 2024 exceeded 30°C in the southern Terai, while remaining below 9°C in the northern regions, as shown in Figure 1. The same north–south gradient persisted in 2025, when Lahan station in Siraha recorded the country's highest annual average maximum temperature at 32.6°C. Temperatures across most of the country were above normal in 2025, by 1–2°C in some areas, as shown in Figure 2 (DHM 2026a).

Figure 1. 2024 was Nepal's hottest year on record, with average maximum temperatures above 30°C across the Terai region



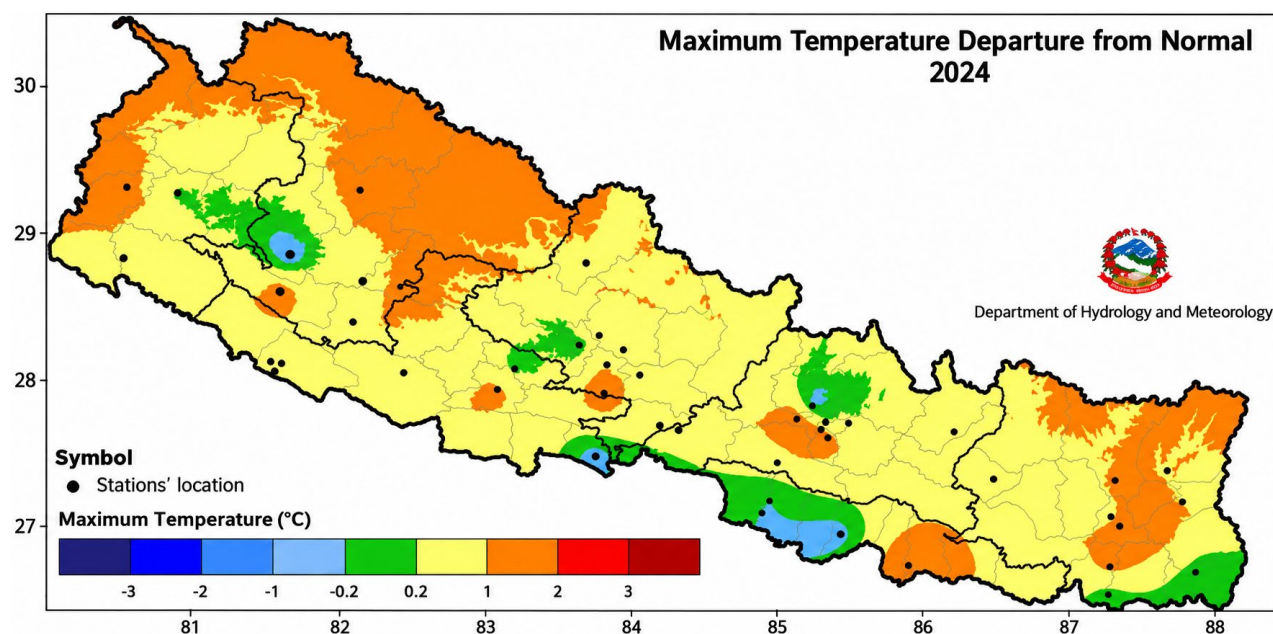
Source: DHM (Department of Hydrology and Meteorology). 2025. *State of the Climate of Nepal 2024*. Department of Hydrology and Meteorology, Government of Nepal.

Figure 2. In 2025 the north–south temperature divide persisted with the Terai remaining the warmest region



Source: : DHM (Department of Hydrology and Meteorology). 2026a. State of the Climate of Nepal 2025. Department of Hydrology and Meteorology, Government of Nepal.

Figure 3. Maximum temperatures exceeded normal levels by 2°C across Nepal in 2024



Source: DHM (Department of Hydrology and Meteorology). 2025. State of the Climate of Nepal 2024. Department of Hydrology and Meteorology, Government of Nepal.

Recent observations indicate that above-normal temperatures are becoming a persistent feature across Nepal, reinforcing the country's continued exposure to extreme heat, particularly in the southern plains. Compared with 1991–2020 long-term normal temperatures, most of the country recorded above-normal annual maximum temperatures in 2024. Semari station in Nawalparasi West recorded the highest annual maximum temperature at 31.5°C, while Jomsom in Mustang recorded the lowest annual maximum temperature at 17.7°C (Figure 3). Dhankuta recorded the largest positive anomaly, at 2.0°C (DHM 2025). The national average maximum temperature in 2025 was marginally lower than in 2024, but above-normal maximum temperatures persisted during most months (Figure 4; DHM 2026a), indicating a continued risk of extreme heat in the southern plains.

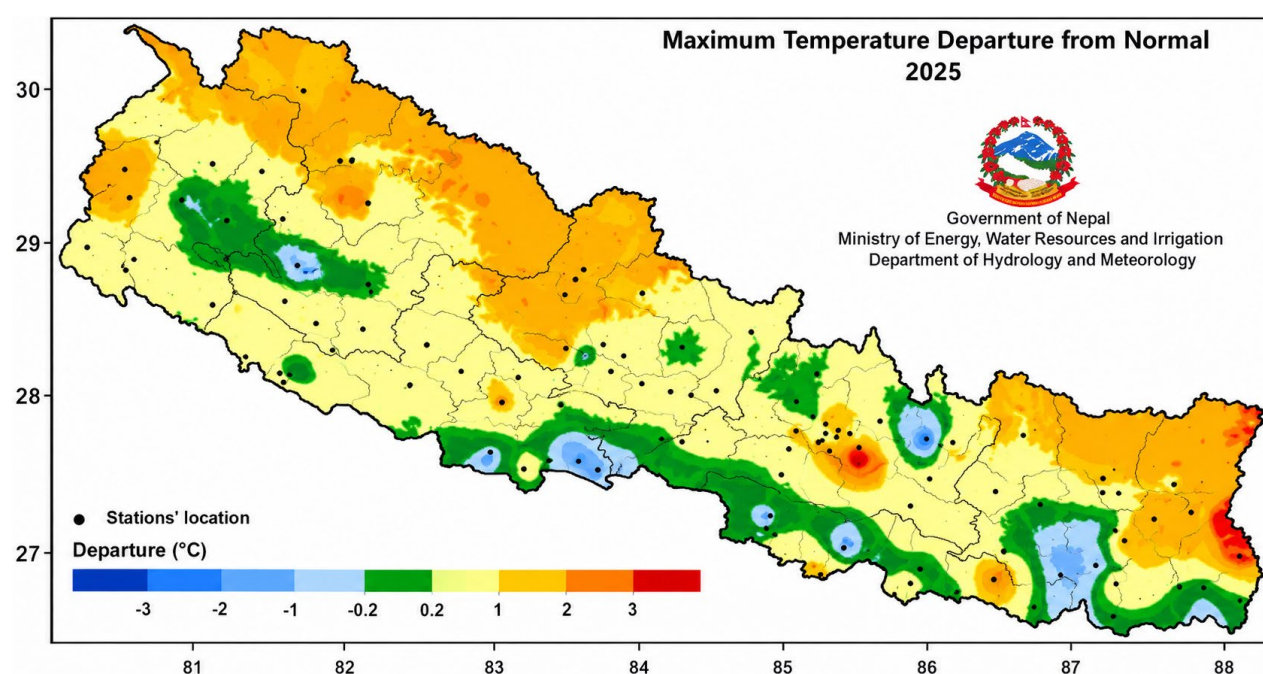
In heavily populated urban areas such as Kathmandu Valley and the core cities of the Terai region, including Nepalgunj, Chitwan, and Biratnagar, the urban heat island effect intensifies and prolongs heatwaves. The consequences extend beyond public health, affecting labour productivity, poorer air quality, and widening socioeconomic inequalities (Singh and Subedi 2022).

The Terai remains Nepal's primary heat hotspot while above-normal temperatures are becoming more widespread (DHM 2025, 2026a).

2.3. Future projections and assessment

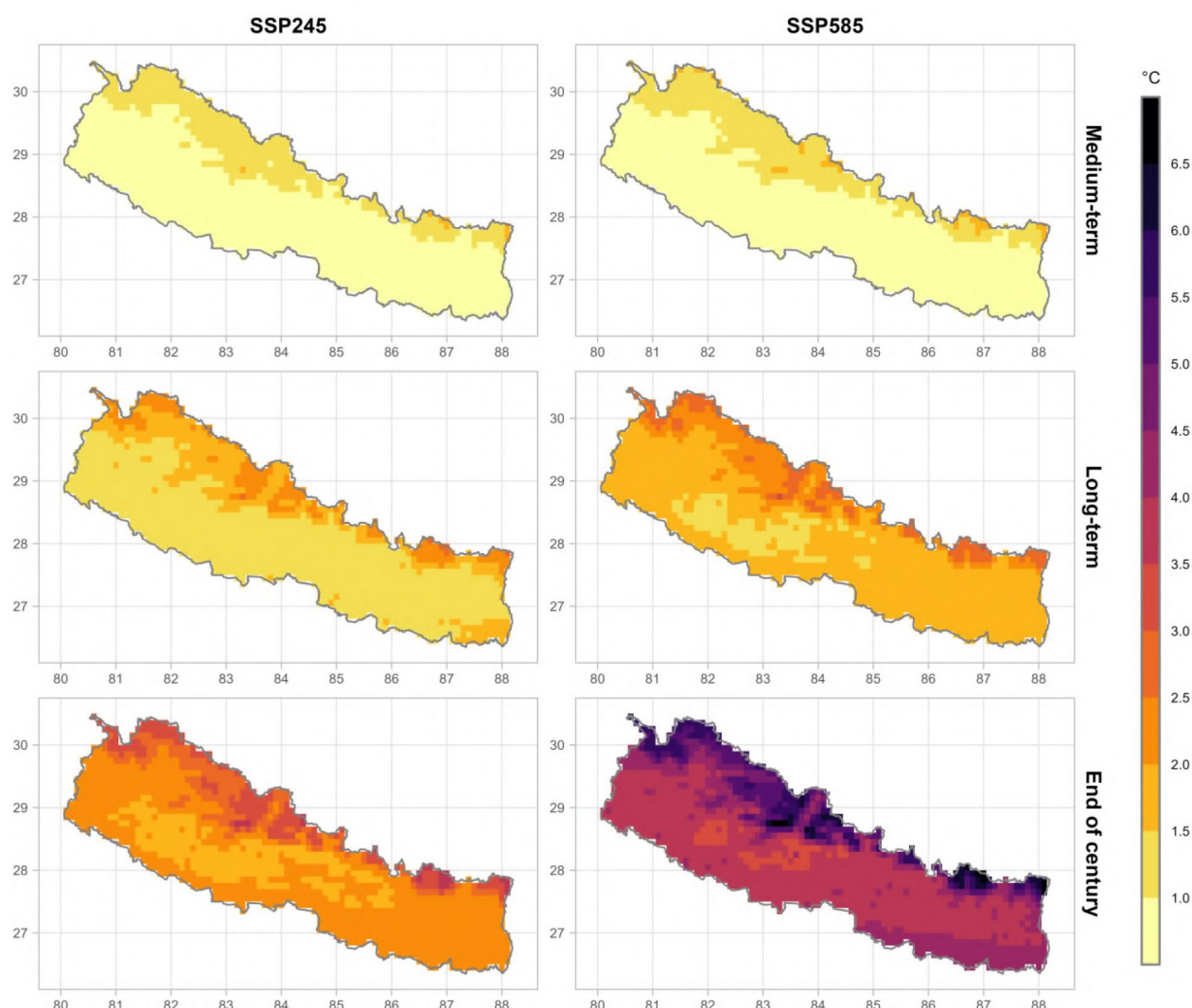
Climate projections indicate that Nepal could experience a substantial increase in average temperatures and in the frequency, duration, and intensity of extreme heat events over the course of the 21st century. According to Nepal's NAP, which draws on the IPCC Sixth Assessment Report (AR6), mean annual temperatures are projected to rise by approximately 1.5–1.6°C during 2021–40, 2.0–2.4°C during 2041–60, and 2.7–4.4°C during 2081–2100, depending on greenhouse gas emissions scenarios. Under the high-emissions SSP5-8.5 pathway, warming could exceed 4°C by the end of the century. Such increases are expected to intensify extreme heat (MoAFE 2021).

Figure 4. Maximum temperatures exceeded normal levels by 1–2°C across Nepal In 2025



Source: DHM (Department of Hydrology and Meteorology). 2026a. State of the Climate of Nepal 2025. Department of Hydrology and Meteorology, Government of Nepal.

Figure 5. Projected warming could reach up to 7°C in parts of Nepal by 2100 under SSP5-8.5



Source: DHM (Department of Hydrology and Meteorology). 2025. *State of the Climate of Nepal 2024*. Department of Hydrology and Meteorology, Government of Nepal.

Note: SSP2-4.5: Shared Socioeconomic Pathway 2 – Radiative Forcing 4.5; SSP5-8.5: Shared Socioeconomic Pathway 5 – Radiative Forcing 8.5.

As shown in Table 1, both temperature and precipitation are projected to increase across Nepal throughout the 21st century. By 2071–2100, annual temperatures are projected to rise by 1.72°C under Representative Concentration Pathway (RCP) 4.5 and 3.58°C under RCP 8.5, while precipitation could increase by 10.7 per cent and 23.0 per cent, respectively. Together, rising temperatures and changing precipitation patterns could intensify heat stress, increase the frequency of extreme weather events, and heighten climate risks across Nepal.

Nepal is projected to experience progressively warmer conditions alongside increasingly variable precipitation, potentially intensifying heat stress and other climate-related risks. By the 2050s, most of the country is projected to experience an increase of less than 20 per cent in annual precipitation, while warming is expected to become more pronounced over time. Relative to the 1981–2010 baseline, average annual mean temperatures in the lower belts are projected to increase by up to 1.5°C under SSP2-4.5 and 2°C under SSP5-8.5 during the medium-term

Table 1. Temperature and precipitation in Nepal are projected to rise steadily with the sharpest increases under high emissions by the century's end

Climatic variable	Medium term (2016–45)		Long term (2036–65)		End of century (2071–2100)	
	RCP 4.5	RCP 8.5	RCP 4.5	RCP 8.5	RCP 4.5	RCP 8.5
Change in precipitation (%)	2.1	6.4	7.9	12.1	10.7	23.0
Change in temperature (°C)	0.92	1.07	1.30	1.82	1.72	3.58

Source: MoAFE (Ministry of Agriculture, Forest and Environment). 2019. *Climate Change Scenarios for Nepal for the National Adaptation Plan (NAP)*. Ministry of Agriculture, Forest and Environment, Government of Nepal.

period (2016–45). By the long-term period (2036–65), warming is projected to increase further, particularly under SSP5-8.5. By the end of the century, mean temperatures could increase by up to 4.5°C under SSP2-4.5 and up to 7°C in some areas under SSP5-8.5, with particularly pronounced warming in the High-Himalayan region (DHM 2024c). These changes point to a future in which rising temperatures and shifts in precipitation patterns may compound heat stress, particularly where higher temperatures coincide with increased humidity.

2.4. Socioeconomic drivers of heat vulnerability in Nepal

Nepal's vulnerability to extreme heat is shaped by its demographic and socioeconomic conditions. The 2021 *National Population and Housing Census* recorded a population of approximately 29.16 million, with a sex ratio of 95.91 males per 100 females (NSO 2023). Gendered patterns of exposure compound heat vulnerability. Nepal's vulnerability to extreme heat is shaped by its demographic and socioeconomic conditions. The 2021 *National Population and Housing Census* recorded a population of approximately 29.16 million, with a sex ratio of 95.91 males per 100 females (NSO 2023). Gender also shapes exposure and capacity to cope with extreme heat. National evidence indicates that women bear a disproportionate share of unpaid domestic and care work, with 60 per cent of women reported to engage in unpaid work during heatwaves (UN Women 2022b). This can increase exposure to heat within and around the household, particularly for women who

combine domestic responsibilities with paid work. Evidence from Dhangadhi illustrates these intersecting vulnerabilities: women, particularly from marginalised and low-income communities, reported exposure to extreme heat while undertaking both paid and domestic work, with nearly half reporting that they did not receive heat alerts. Solid-fuel cooking can further increase indoor heat exposure (Subedi, Khan and Grünholz 2025).

Outmigration continues to reshape Nepal's demographic profile. The Nepali population living abroad grew from 1,921,429 in 2011 to 2,169,478 in 2021, or about 12.9 per cent. Rising outmigration in search of better livelihood opportunities is a critical factor influencing Nepal's slowing population growth rate (Shrestha 2022). As migrants are disproportionately working-age men, agricultural and domestic labour increasingly falls on the women, older people, and children who remain behind. Much of this work is undertaken outdoors or in poorly ventilated settings, increasing heat exposure for these populations (Kim et al. 2019).

Nepal is socioculturally diverse, with more than 125 ethnic groups and castes and 123 languages, including semi-nomadic communities such as the Raute, Chepang, and Byanshi (NSO 2023). Climate change disproportionately affects rural and mountainous regions and communities, including Indigenous Peoples, whose livelihoods depend on climate-sensitive sectors such as agriculture, forestry, and water resources (MoHA 2025). Some of these communities also face structural marginalisation and limited access to services, land, and decision-making, constraining their adaptive capacity and increasing their vulnerability to climate risks.

Heat risk in Nepal is compounded by socioeconomic vulnerability, particularly in urban areas. Residents of informal settlements face disproportionate exposure because of poor housing, limited access to water and healthcare, and a lack of green infrastructure (Giri et al. 2021). Nepal has 6.67 million households, with an average household size of 4.37 people. In 2021, only 53.1 per cent of households had an electric fan, 23.7 per cent had a refrigerator, and 37.7 per cent had internet access. About 4.5 per cent of households, or nearly 300,000 households, had no access to a toilet, while access to cooling and other household assets also remains uneven (NSO 2023). These gaps in access to basic services and household resources can compound vulnerability to heat by limiting households' capacity to maintain safe living conditions and cope with extreme temperatures. Heat vulnerability in Nepal is therefore shaped not only by exposure to high temperatures, but also by access to cooling, essential services, household resources and timely heat-health information.

Economic structure compounds this vulnerability. Nepal's economy is largely dependent on agriculture, remittances, and natural resources, including agricultural land, pastures, and forests. Agriculture

remains central to Nepal's economy and livelihoods, engaging around 66 per cent of the country's population and contributing approximately one-third of the national gross domestic product (GDP) (FAO 2026). The number of full-time jobs affected by heat stress in Nepal is projected to increase from approximately 106,000 in 1995 to 391,000 by 2030. Agriculture remains the most affected sector, with the share of affected jobs increasing from 1.38 per cent to 2.62 per cent, reflecting the high exposure of outdoor and agricultural workers to rising temperatures. The construction sector is also expected to increase from 0.08 per cent to 0.23 per cent, while the share of affected jobs in services is projected to rise from 1.17 per cent to 2.05 per cent (ILO 2019). For these workers, the constraint is economic rather than informational. Among 356 outdoor workers surveyed across 8 districts, 78.6 per cent had experienced heat-related incidents, but only 43 per cent recognised the term "heatwave", and many described having no alternative to work through the day's heat because the day's wage was their only income (Sharma et al. 2025). Addressing heat vulnerability in Nepal therefore requires responses that account for socioeconomic conditions alongside physical exposure.

3. Policy and institutional mechanisms to mitigate heat risk

Nepal became a federal state in 2015, devolving powers and functions across three tiers of government: the federal government, 7 provincial governments, and 753 local governments. The first local and provincial elections were held in 2017, and the tiers became operational that year. This decentralisation has been reinforced through a series of policy and legislative reforms that have strengthened subnational roles in climate change adaptation (CCA) and disaster risk reduction and management (DRRM).

On climate change adaptation, policy instruments including the National Climate Change Policy, 2019, the Local Adaptation Plans of Action (LAPA) Framework, 2019, and the Environment Protection Act, 2019, formalised climate-related roles and responsibilities across levels of government (Khatri et al. 2022). A similar shift occurred in disaster governance through the Disaster Risk Reduction and Management Act, 2017, the Disaster Risk Reduction National Policy, 2018, and the Disaster Risk Reduction National Strategic Action Plan (2018–2030) (AIDMI 2024; Vij et al. 2020).

As part of these reforms, the National Disaster Risk Reduction and Management Authority (NDRRMA) was established in 2019 under the Ministry of Home Affairs (MoHA), with a mandate to coordinate, facilitate, and support DRRM (MoHA 2022). It also serves as the secretariat to two bodies. The National Disaster Risk Management Council, chaired by the prime minister, sets strategic direction and policy, while its executive committee, chaired by the home minister, handles operations and coordination with line ministries (MoHA 2022). Provincial and local governments have, in turn, established their own DRRM structures for disaster preparedness and response at their respective levels (MoHA 2022).

However, the devolution of authority has not been matched by comparable institutional capacity at the subnational level. Technical expertise, financial resources, and access to international climate finance remain concentrated at the federal level, limiting what provincial and local governments can actually deliver on adaptation and disaster management (Khatri et al. 2022). Heat governance in Nepal is therefore evolving within a broader governance system that still faces capacity, coordination, and resource allocation challenges. While these constraints apply across hazards, heat lags further behind. Heat has no established localised warning thresholds, sector-specific advisories comparable to flood warnings, data in the Building Information Platform Against Disaster (BIPAD) portal, or a dedicated financing line within the Disaster Management Fund. It also remains under-prioritised given its slow onset and less visible impacts (Bhandari et al. 2025). Civil society organisations and development partners have consequently played an important role in supporting local heat resilience through evidence generation, heat action planning, and anticipatory action initiatives.

3.1. Evolution of heat risk governance in Nepal

Like many countries in South Asia, Nepal has seen extreme heat become increasingly prevalent over the last two decades. Before 2024, Nepal's heat action planning was primarily undertaken at the local level. The *Nepalgunj Heat Action Plan*, the country's first city-level heat action plan (HAP), was developed by the Nepalgunj Sub-Metropolitan City in 2023 with support from the Nepal Red Cross Society (NRCS)

Heat governance in Nepal is expanding but local capacity, financing, data and heat-specific warning systems remain limited (Khatri et al. 2022; Bhandari et al. 2025).

and the International Federation of Red Cross and Red Crescent Societies (IFRC) network, including the Finnish Red Cross, American Red Cross, and the Red Cross Red Crescent Climate Centre (Kharel 2026; Subedi et al. 2023). It marked an important milestone in recognising heat as an emerging governance and public health challenge, introducing measures for preparedness, awareness generation, early warning dissemination, and protection of vulnerable populations.

The *Nepalgunj Heat Action Plan* builds on an earlier study that identified heat thresholds and hotspots in the city, and combines secondary analysis of health, water supply, electricity, and urban greening systems with structured household surveys, focus group discussions, key informant interviews, and a government stakeholder workshop (Subedi et al. 2022).

It is organised in two parts: seasonal heat-risk reduction and longer-term urban planning measures. Seasonal heat-risk reduction is further divided into three phases: (i) preparation from January to March; (ii) response from April to June; and (iii) after-action review from July to September. Its seasonal actions are specific and assigned which are supposed to be implemented: cooling centres operate from 10 a.m. to 4 p.m. with a capacity of 75 people, with the first located beside the daily-wage labour market in Ward 13; water ATMs, which are a coin- or card-operated dispensing unit that provides purified drinking water on demand and tanker distribution services serve water-stressed wards; the roofs of 50 tin-roofed households in Wards 18–22 have been painted white; LED boards display daily maximum temperatures; and heat messaging is broadcast in both Nepali and Awadhi. Longer-term measures cover energy, healthcare, building construction, water supply, and urban greenery.

Building on these local initiatives, the NDRRMA issued Nepal's first federal heat plan in 2024 – the *Plan of Action for Risk Reduction and Response on Measures for Protection from Heat Wave* (Kharel 2026; NDRRMA 2024). The plan recognised that heatwaves

require coordinated action across multiple levels of government and assigned responsibilities to lead and supporting agencies, though it remained primarily focused on emergency relief and rapid response.

The subsequent *National Action Plan for Preparedness, Pre-Emptive Action and Rapid Response to Extreme Heat or Heat Wave (Loo) and Drought, 2026*, adopted a broader and more anticipatory approach. It expanded heat governance beyond emergency response by introducing sector-specific actions across health, education, infrastructure, agriculture, and drought management, while prioritising vulnerable populations (NDRRMA 2026a). The plan also introduced a range of preparedness measures to reduce the health and socioeconomic impacts of extreme heat, including community-level cooling centres, restoration of green spaces, water conservation initiatives, public awareness campaigns, and measures to strengthen heat resilience in agriculture. NDRRMA has also published the *National Framework for Anticipatory Action, 2026*, to institutionalise anticipatory action for nine forecastable hazards, including extreme heat and heatwaves, within the federal disaster management system (NDRRMA 2026b).

Despite this progress, the devolution of responsibilities has not consistently translated into effective implementation. Technical capacity, financing, institutional coordination, and clear accountability mechanisms remain uneven across government levels. The 2026 plan advances heat governance, but offers limited guidance on dedicated financing, structural interventions, and monitoring and evaluation frameworks to measure reductions in heat risk. These gaps are most visible in the health sector, where the burden of extreme heat is direct, growing, and still poorly tracked.

Several factors help explain why health has remained peripheral. Nepal's disaster management architecture developed around discrete, visible hazards such as earthquakes, floods, and landslides, whose casualties are immediate and attributable. Heat operates differently, contributing to cardiovascular and renal stress and exacerbating chronic conditions. Heat-related deaths may therefore be recorded under other causes, making the overall mortality burden less visible in policy discussions. This invisibility is compounded by the absence of systematic heat-health surveillance: the Nepalgunj HAP requires hospitals to record heat-related admissions, highlighting the need for baseline data.

3.2. Heat-related health risks and preparedness

Heat stress is an emerging public health concern in Nepal. The country's diverse topography creates considerable regional variation in heat exposure, but evidence suggests that heat-related risks are intensifying across the country. Analysis of meteorological data from 1987–2016 found an increasing heat index – a measure of how hot conditions feel based on air temperature and humidity – and a growing number of days classified within the heat-stress categories of “Caution”, “Extreme caution”, “Danger”, and “Extreme danger” (Dhimal et al. 2018). While the highest levels of heat stress occur in the Terai and southern lowlands during the pre-monsoon and monsoon seasons, rising temperatures combined with increasing humidity are extending heat-related risks to higher-elevation areas (Dhimal et al. 2018).

The health impacts of this growing exposure are already evident. In Nepalgunj Sub-Metropolitan, where average heat index values peaked at 42°C and maximum heat index levels remained within the “Danger” category from May to September 2019, more than 60 per cent of surveyed residents reported experiencing heat-related symptoms during the hot season (Bhatta and Pahari 2021). Reported symptoms ranged from relatively mild conditions, such as headaches, dizziness, skin rashes, excessive sweating, and muscle cramps, to more severe conditions, including hyperthermia, breathing difficulties, unconsciousness, and seizures. However, only 14.3 per cent of affected individuals sought care at a health facility. A more recent household survey in Nepalgunj and Siddharthanagar (n = 1,465) found a similar pattern: 23 per cent of Nepali respondents reported that they or a household member required medical attention for heat-related illness (Khan et al. 2026). However, the need for medical attention did not always translate into care-seeking. Outdoor workers, such as autorickshaw drivers and cobblers in Siddharthanagar, reported that they had never sought medical care, instead managing their symptoms with over-the-counter medication (Khan et al. 2026). These findings suggest that heat-related illness may be underreported and inadequately captured by routine health surveillance systems (Khan et al. 2026; Bhatta and Pahari 2021; Dhimal et al. 2018).



Image: iStock

From retreating Himalayan glaciers to lowland temperatures above 40°C, warming is reshaping climate risk across Nepal.

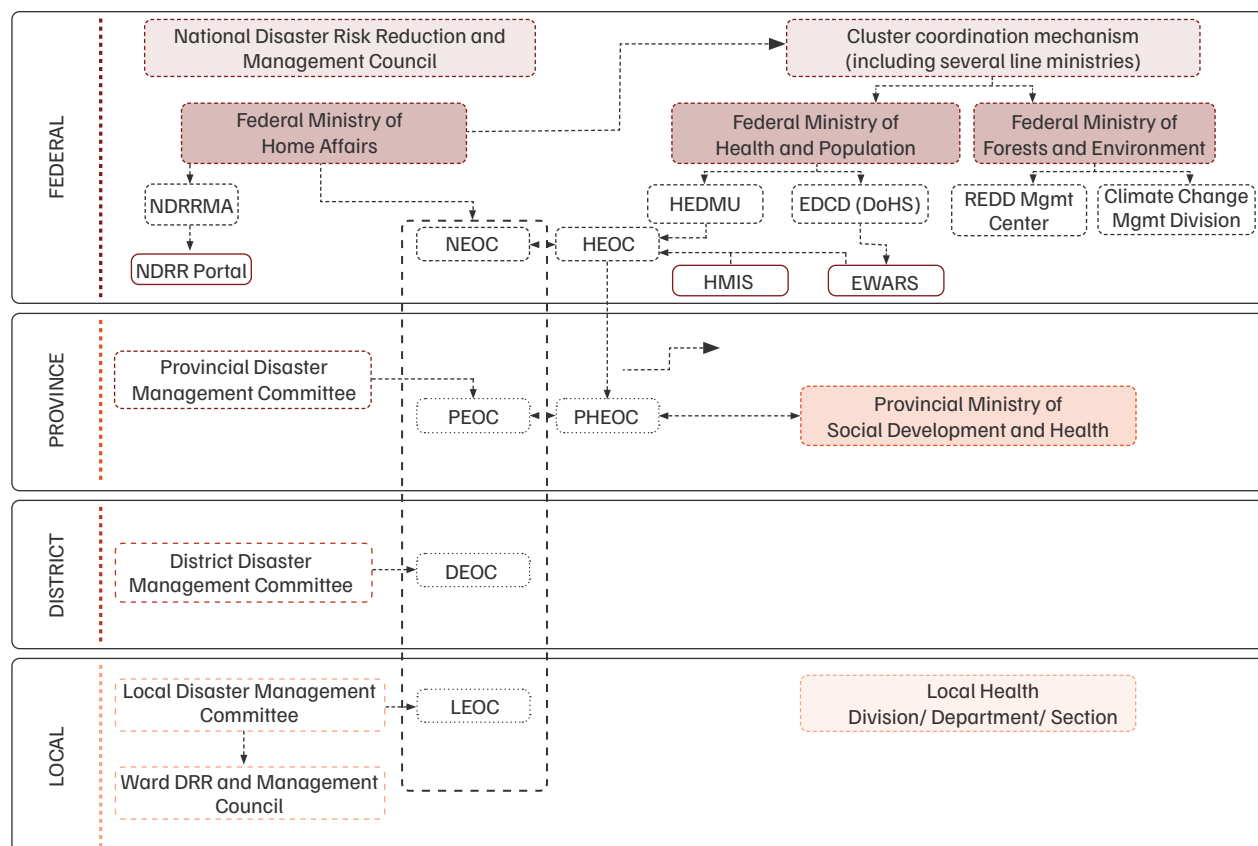
Those least likely to seek care are also the most exposed. Outdoor workers are frequently exposed to ambient temperatures between 36°C and 39°C under conditions of high humidity and strenuous physical activity, increasing the risk of heat-related illness two- to threefold (Venugopal et al. 2021 as cited in Sharma et al. 2025). Limited awareness of heatwave risks, inadequate protective measures, and the absence of workplace safeguards further exacerbate heat-related risks. Prolonged occupational heat exposure has also been linked to chronic kidney disease of non-traditional origin (CKDnT) among workers (Thapa et al. 2026). Beyond its physical health impacts, heat exposure can affect mental health and overall well-being, contributing to anxiety, depression, and aggressive behaviour (Kovats and Hajat 2008 as cited in Sharma et al. 2025).

Extreme heat acts as a risk multiplier for other climate-sensitive health outcomes. Hospitalisations for water- and vector-borne diseases are estimated to increase by 3–9 per cent and 2–12 per cent, respectively, for every 1°C rise in temperature (Shrestha 2018). Rising temperatures are further altering the distribution of disease vectors, contributing to the spread of dengue, malaria, and other vector-borne diseases in higher-

elevation areas previously considered at low risk (Dhimal et al. 2017). These interconnected impacts highlight that heat is not only a direct physical health hazard but also a driver of broader climate-sensitive health risks.

Recognising these challenges, Nepal has increasingly integrated climate-sensitive health risks into national health policies and planning frameworks. Key policies and plans, including the *National Health Policy, 2019*, the *Nepal Health Sector Strategic Plan (NHSSP 2023–2030)*, and the *Health National Adaptation Plan (H-NAP): Climate Change Health Adaptation Strategy and Action Plan (2023–2030)*, recognise the health sector as highly vulnerable to climate change and outline measures to strengthen health system resilience. Nepal has also introduced climate-specific initiatives, including climate-health focal points within the Ministry of Health and Population (MoHP) and early warning mechanisms (Reddy et al. 2026). Alongside these national frameworks, several cities have developed HAPs that specifically focus on health as part of their preparedness measures. These policy commitments and plans rest on an institutional arrangement that spans multiple agencies and levels of government, as summarised in Figure 6.

Figure 6. Key institutional arrangements for managing disasters and climate-related health risks in Nepal



Source: Khanal, Sundeepa, Tabea Schubert, Melanie Boeckmann, and Fabienne Pradella. 2025. "Assessing Health Facility Preparedness in Nepal for Addressing Climate-Related Disasters and Climate-Sensitive Diseases." *Frontiers in Climate* 7: 1625829.

Note: DEOC: district emergency operation centre; EDCC: Epidemiology and Disease Control Division; EWARS: Early Warning, Alert and Response System; HEDMU: health emergency and disaster management unit; HEOC: health emergency operation centre; HMIS: Health Management Information System; LEOC: local emergency operation centre; NDRR: Nepal Disaster Risk Reduction portal of Ministry of Home Affairs; NDRRMA: National Disaster Risk Reduction and Management Authority; NEOC: National Emergency Operation Centre; PEOC: provincial emergency operation centre; PHEOC: provincial provincial health emergency operation centres.

While Nepal has shown leadership in developing plans and policies, weak coordination across federal, provincial, and local levels, unclear institutional mandates, health workforce shortages, and the uneven distribution of health personnel continue to hinder effective implementation (Wasti et al. 2023). Similarly, limited managerial capacity, inadequate prioritisation of climate-health risks, and limited climate-health expertise undermine preparedness and service delivery (Reddy et al. 2026). Many health facilities lack climate-resilient infrastructure and remain insufficiently prepared, while financing constraints, including delayed fund disbursement,

inefficient budget utilisation, and underinvestment in preparedness and adaptation, further limit resilience-building efforts (Khanal et al. 2025; Wasti et al. 2023).

The expansion of District Health Information Software (DHIS-2) and electronic reporting systems has strengthened Nepal's Health Management Information System (HMIS), but challenges related to data quality, verification, and workforce capacity persist (Wasti et al. 2023). Surveillance of heat-related health outcomes remains a significant gap. Nepal's Early Warning and Reporting System, its principal sentinel surveillance mechanism, covers six priority

communicable diseases but does not capture heat-related illness. Nepal also has no established system for recording heat-related mortality (Dhimal et al. 2018; EDCD 2026). Recent assessments continue to call for an integrated heat-health surveillance system that links DHM alerts to MoHP reporting, indicating that this gap remains open. This absence of standardised reporting limits the ability to quantify the true burden on health and to assess the relationship between heat exposure and health outcomes (Dhimal et al. 2018). Climate resilience initiatives, including early warning systems and disease-specific interventions, remain fragmented and are not yet fully integrated into broader health system planning and governance (Reddy et al. 2026).

Strengthening heat-health preparedness will therefore require moving beyond policy recognition towards institutionalisation and implementation. Three priorities are particularly important. First, establish a comprehensive heat-health surveillance system that integrates meteorological, health, and disaster-risk information to support evidence-based decision-making and early action. Second, embed heat-health preparedness within routine health system planning and service delivery through stronger coordination mechanisms, dedicated financing, climate-resilient infrastructure and preventive care, and workforce capacity building. Third, strengthen community-based preparedness to support risk communication, early action, and outreach to vulnerable populations. Nepal's extensive *Female Community Health Volunteers* (FCHVs) network is already an important community-level asset for building heat resilience, particularly in underserved and remote areas. More than 50,000 volunteers, present in every ward of the country, could be trained to recognise heat illness, refer and report severe cases, and thereby extend surveillance into communities (MoHP 2025).

3.3. Extending forecasting capacities and the early warning system

The DHM, under the Ministry of Agriculture, Forest and Environment (MoAFE), is mandated to monitor hydrological and meteorological conditions across Nepal. It generates and disseminates timely

information on extreme weather events to support early action and reduce loss of life and property (DHM n.d.a). The *Hydrology and Meteorology Policy, 2024*, provides the overarching framework for planning and implementing measures to address extreme weather events, including extreme heat, and guides the issuance of early warning bulletins to support preparedness and response (DHM 2024a).

The DHM has the technical capacity to generate both nowcasts and extended-range forecasts, including forecasts for urban areas. For extreme heat, DHM issues special bulletins on hot days and heatwave conditions, monitoring their evolution and providing outlooks on their likely intensity and duration using an absolute threshold of 40°C and percentile-based categories (DHM 2026a; DHM n.d.b). A day is classified as a hot day, very hot day, or extreme hot day when the observed maximum temperature exceeds the station's 90th, 95th, or 99th percentile, respectively, based on April–September records from 1981–2020. A mild, moderate, or extreme heatwave is declared when the maximum temperature exceeds the corresponding threshold for three or more consecutive days (DHM n.d.b). The Weather Research and Forecasting (WRF) numerical modelling system supports forecasting, including DHM-WRF, DHM-WRFDA (WRF Data Assimilation), and DHM-EWS (early warning system), which generate forecasts for key variables such as precipitation, temperature, wind, and wind gusts (DHM n.d.c). The models are run four times daily using Global Forecast System (GFS) data at 00, 06, 12, and 18 UTC to generate regional mesoscale predictions (DHM n.d.c). They provide a three-day forecast using a 9 km parent domain with a 3 km nested domain (DHM n.d.c).

The DHM disseminates information through the NDRRMA, provincial and local governments, district disaster management committees (DDMCs), security agencies, and development partners (NDRRMA 2026a). At the local level, DDMCs and local governments prepare context-specific advisories and disseminate heat-risk information to communities through multiple channels, including radio, television, social media, loudspeakers, local-language communications, and helplines, to support community preparedness and response (NDRRMA 2026a). In practice, however, the heat warning structure remains fragmented and insufficiently locally relevant, limiting its ability to reach vulnerable groups with actionable guidance (Khan et al. 2025).

Local and humanitarian actors are beginning to complement Nepal's existing heat-warning system with impact-oriented thresholds that connect forecasts to predefined early actions. In Nepalgunj, for example, the heat index (HI) has been identified as an early-action trigger, with an HI of 47 proposed as a critical impact threshold (Subedi et al. 2022). The NRCS, supported by the IFRC, has also developed simplified early action protocols (SEAPs) for Biratnagar, Nepalgunj, Siddharthanagar, and Dhangadhi. Using city-specific percentile thresholds, these protocols connect heatwave forecasts with predefined preparedness and response measures to facilitate timely, coordinated action at the local level (IFRC 2025).

These efforts are also being complemented by a broader shift towards impact-based forecasting at the national level. With support from the Regional Integrated Multi-Hazard Early Warning System (RIMES) and the South Asia Hydromet Forum (SAHF), Nepal launched a national demonstration of impact-based forecasting (IBF) for extreme heat in 2026. The initiative aims to strengthen early warning systems by linking forecasts with information on exposure, vulnerability, impacts, and sector-specific early actions to support the development of a people-centred Heatwave Early Warning and Early Action System (HEWEAS) and enable anticipatory action before heat impacts occur (RIMES 2026).

4. Non-government and community-oriented solutions

NGOs, civil society organisations, and community groups contribute to building heat resilience in Nepal, particularly by reaching vulnerable populations through locally appropriate solutions. Their work spans awareness-raising, community preparedness, coping strategies, and nature-based and low-cost adaptation measures. The case studies below illustrate how these approaches are being implemented in different local contexts and highlight lessons that could inform heat-resilience efforts elsewhere.

Non-government initiatives are expanding locally led heat action through early warnings, cooling measures, awareness and heat action planning (NRCS 2025; IFRC 2025; People in Need 2025).

4.1. Red Cross heat action initiatives in Nepal

The NRCS, in partnership with the International Federation of Red Cross and Red Crescent Societies (IFRC), the American, British, and Finnish Red Cross societies, and with technical support from the Red Cross Red Crescent Climate Centre, has implemented heat-risk preparedness and response initiatives in four heat-affected cities: Nepalgunj, Siddharthanagar, Biratnagar, and Dhangadhi. Its public awareness campaigns reached more than 882,724 people through brochures, posters, pamphlets, radio, television, social media, public announcements, kiosks, and LED display boards. The IFRC has also developed Nepali-language heat action campaign posters covering at-risk groups, heat-stress symptoms, first aid, and protective behaviour (Figure 7). These materials are freely available through the Global

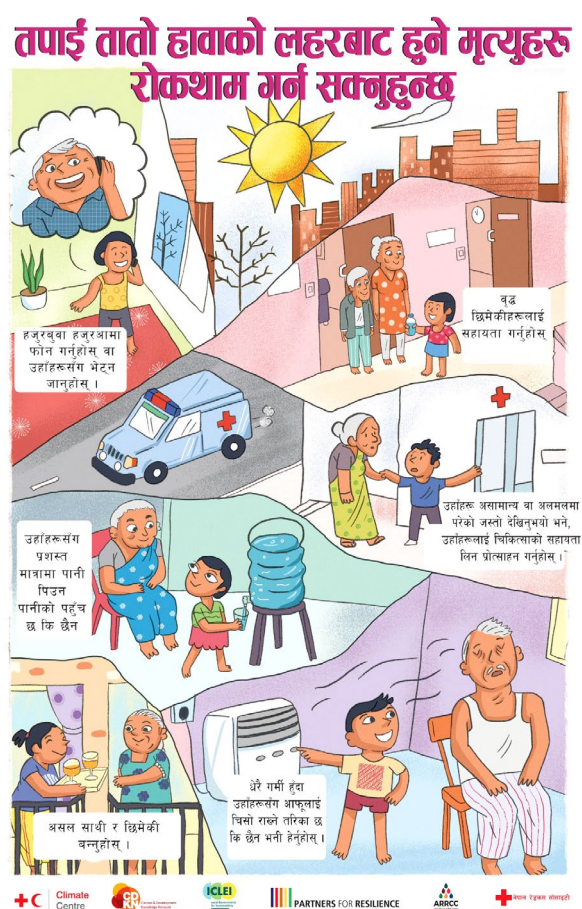
Disaster Preparedness Center's heat toolkit, alongside guidance for conducting local heat campaigns. These efforts focused on increasing awareness of extreme heat risks and promoting practical measures to reduce heat exposure (NRCS 2025).

The initiative also supported anticipatory action and community-level adaptation, reaching more than 4,443 people through household visits, health check-ups, heat warning communication, safe drinking-water stations in schools, and support for a cooling centre in Nepalgunj. As a pilot adaptation measure, cool roofs were installed in 14 households and two schools, benefiting 637 people.

The programme also focused on institutional capacity and heat action planning. In total, 287 people were

reached through capacity-building activities for local governments and stakeholders, including workshops for occupationally exposed groups and teachers. The programme supported the development of HAPs for Siddharthanagar, Biratnagar, and Dhangadhi by undertaking consultations, data collection and analysis, the development of heat thresholds and triggers, and validation workshops, involving more than 204 people. In addition, documentation and knowledge-sharing activities included reviewing the implementation of HAPs, developing a heat action video, and marking Heat Action Day. Overall, the initiative demonstrates an integrated approach combining public awareness, anticipatory action, cooling interventions, capacity building, and heat action planning to strengthen heat resilience in Nepal.

Figure 7. Heat action campaign posters in Nepali, developed by the IFRC, target different vulnerable groups, providing practical guidance on heat-health protection and preparedness



Source: International Federation of Red Cross and Red Crescent Societies 2022.



Women carrying heavy loads outdoors face compounded heat stress from physical exertion and high temperatures.

4.2. ZCRA's work in Nepal

The Zurich Climate Resilience Alliance (ZCRA) is a multi-sectoral partnership powered by the Zurich Foundation, working across 24 countries, including Nepal. Its nine members are Zurich Insurance Company Ltd, Concern Worldwide, the IFRC, Mercy Corps, Plan International, Practical Action, and the Institute for Social and Environmental Transition (ISET)-International, with the International Institute for Applied Systems Analysis (IIASA) and the London School of Economics and Political Science (LSE) Grantham Research Institute as research partners. In Nepal, Practical Action and Mercy Corps lead implementation, working to strengthen locally led adaptation and climate resilience financing (ZCRA 2025). As documented in the ZCRA's *Pathways to Locally Led Adaptation* report, Mercy Corps' budget tracking helped Madhesh Province and five municipalities commit 5 per cent of sectoral budgets to climate change adaptation and disaster risk reduction (CCA/DRR). The report also notes that Practical Action's Climate Resilience Measurement for Communities (CRMC) assessments across 57 communities in 13 municipalities informed municipal planning and contributed to increased CCA/DRR allocations and investments in heat- and flood-resilience measures (Lehtman and Tyldesley 2026).

Practical Action has worked on climate resilience in Nepal through community-based disaster risk reduction and climate adaptation initiatives. Its work has included strengthening end-to-end flood early warning systems, community preparedness, and locally appropriate resilience measures such as parametric insurance, bio-dykes, and livelihood diversification. Building on this foundation, the organisation is extending its expertise to extreme heat through heat alerts, the development of HAPs, and the application of artificial intelligence (AI) to strengthen risk identification, forecasting, communication, and decision-making. It is also exploring parametric insurance and other risk-financing approaches to address heat-related impacts, while supporting locally informed planning and responses that account for vulnerable populations' needs (ZCRA 2025).

Mercy Corps, which began operations in Nepal in 2005, has worked to strengthen the absorptive, adaptive, and transformative capacities of vulnerable individuals and communities through disaster risk reduction and climate adaptation. Its 2025 study of 347 public schools across 79 municipalities in Madhesh Province assessed heat vulnerability by examining the impacts of heatwaves on students and teachers, existing coping mechanisms, and institutional gaps in preparedness and adaptation.

The findings can inform efforts to strengthen school-level heat resilience, as well as targeted adaptation measures and policy action (Mercy Corps Nepal 2026; Mercy Corps Nepal 2025).

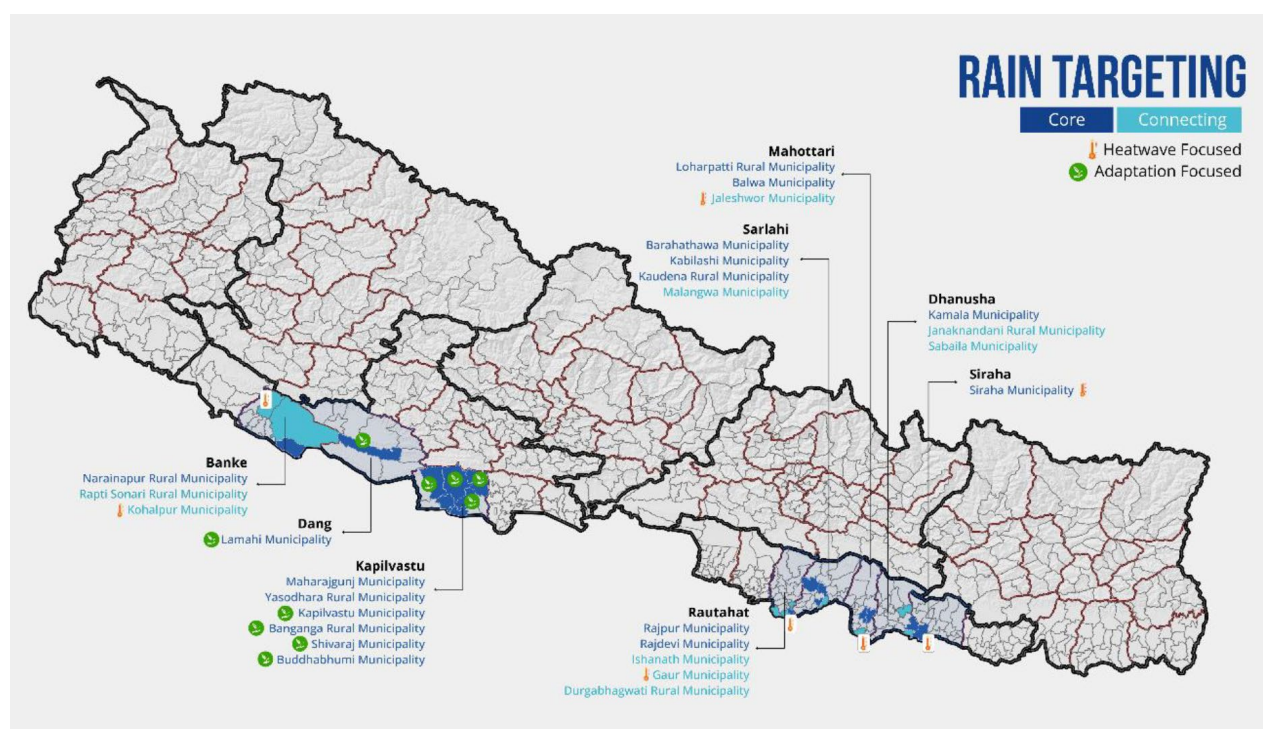
4.3. Resilience, Adaptation, and Inclusion (RAIN) programme in Nepal

The *Resilience, Adaptation, and Inclusion* (RAIN) programme in Nepal is a climate change adaptation and disaster risk management initiative funded by the UK's Foreign, Commonwealth and Development Office (FCDO) and led by People in Need and other partners. The programme's primary goal is to build the resilience of communities at risk of natural hazards and to strengthen the Government of Nepal's capacity to plan, budget, and implement adaptation policies and measures. It targeted 26 local governments (LGs),

comprising 16 in Madhesh Province and 10 in Lumbini Province, as shown in Figure 8. The programme piloted a heat early action standard operating procedure (SOP) in June 2025 across the municipalities of Gaur, Jaleshwar, and Siraha in Madhesh Province to manage extreme temperature risks. Activated in June 2025 in response to a DHM forecast of a severe heatwave, the pilot established evidence-based trigger thresholds at local 95th maximum temperature percentiles: 38.5°C in Gaur, 38.05°C in Jaleshwar, and 36.5°C in Siraha. These pre-identified thresholds helped coordinate local government bodies, land rights forums, and Red Cross chapters to mobilise field preparations ahead of the heat spike, ensuring emergency actions were deployed before the community suffered the worst of the heatwave (Neupane 2025; People in Need 2025).

The subsequent rapid interventions focused on vulnerable groups, including street vendors, rickshaw riders, landless families, and outdoor daily-wage labourers in crowded public spaces. More than 17,500 outdoor workers accessed safe drinking water through temporary hydration stations, and trained

Figure 8. Map showcasing the municipalities with heatwave-focused and adaptation-focused work under the RAIN programme



Source: People in Need. 2025. "Resilience, Adaptation, and Inclusion in Nepal (RAIN) Programme."

5. Conclusion

Extreme heat has rapidly emerged as a critical public health, environmental, and developmental challenge across South Asia, shifting from seasonal discomfort to a compounding systemic threat. This is driven by the convergence of high ambient temperatures, rapid and unplanned urbanisation, and deeply entrenched socioeconomic inequalities. The macroeconomic and human consequences of these changes are significant.

Nepal needs to transition from a largely reactive response to extreme heat towards a more proactive and integrated approach to heat-health action. This requires strengthening institutional preparedness across levels of government while ensuring that interventions respond to the differing risks faced by populations and places. The report highlights five priorities.

- **Strengthen heat-health surveillance.** A clearer, more systematic on mortality and morbidity would underpin an effective response. There is scope for the Ministry of Health and Population, in coordination with the DHM, to strengthen reporting of heat-related morbidity and mortality, beginning with hospitals in the heat-prone districts of the Terai. Improved surveillance would provide the evidence needed to understand the health burden of heat and to inform preparedness and resource allocation.
- **Integrate heat-health surveillance into the early warning system.** Forecasts are most useful when they trigger a clear response. Strengthening the link between meteorological information, locally appropriate heat-health thresholds, and health-sector surveillance would allow rising heat risk to translate into predefined public health actions. These could include activating health facilities, issuing targeted alerts, and directing resources towards locations where health impacts are emerging.

Nepal needs to connect heat surveillance, early warnings and local action to strengthen heat-health resilience (Dhimal et al. 2018; Khan et al. 2025; Khatri et al. 2022).

- **Strengthen local capacity and coordination for heat action.** The effectiveness of national guidance ultimately depends on the capacity of provincial and local governments to act. Local heat-health preparedness could be strengthened by clarifying institutional responsibilities, building technical capacity, and establishing coordination mechanisms across health, disaster management, meteorological, and local government authorities. Locally developed heat-health action plans can then translate national guidance into measures suited to local risks, resources, and populations.
- **Mainstream heat risk across sectors.** Heat resilience cannot rest on seasonal advisories alone. Embedding heat considerations into the decisions that shape exposure and coping capacity, including health-system preparedness, urban planning, workplace safety, housing, and disaster risk management. It would allow longer-term investments in cooling, shaded and heat-resilient public spaces, safer workplaces, and resilient health facilities to complement emergency responses.
- **Apply a differential vulnerability lens to heat-health action.** A single, uniform heat response is unlikely to serve everyone equally. Heat-health planning benefits from accounting for how occupation, income, gender, location, access to services, and other socioeconomic conditions shape people's exposure and ability to respond. Policies and interventions should prioritise groups facing higher exposure or limited capacity to adapt, including outdoor and informal-sector workers, low-income households, and communities in heat-prone areas. Existing community networks, including the *Female Community Health Volunteers (FCHVs)*, offer a means to strengthen household-level outreach, risk communication, and locally generated evidence on how heat is experienced across different groups. FCHVs already contribute to community-based surveillance and risk communication, providing an established platform that could be strengthened for heat-health action (MoHP 2025; WHO 2024).

The GHHIN South Asia Hub can support these priorities in Nepal by convening stakeholders, strengthening the regional evidence base, facilitating knowledge exchange, and building capacity for heat-health action. By connecting Nepal, Bhutan,

Bangladesh, and India around shared priorities and solutions, the Hub can facilitate institutional collaboration and cross-country learning, helping countries strengthen sustained and anticipatory heat-health resilience across South Asia.

Acronyms

AI	artificial intelligence	FAO	Food and Agriculture Organization of the United Nations
AIDMI	All India Disaster Mitigation Institute	FCDO	Foreign, Commonwealth and Development Office
AR6 (IPCC)	<i>Sixth Assessment Report of the Intergovernmental Panel on Climate Change</i>	FCHVs	<i>Female Community Health Volunteers</i>
BIPAD	Building Information Platform Against Disaster	GDP	gross domestic product
CCA	climate change adaptation	GFS	Global Forecast System
CKDnT	chronic kidney disease of non-traditional origin	GHHIN	Global Heat Health Information Network
CRMC	Climate Resilience Measurement for Communities	H-NAP	<i>Health National Adaptation Plan</i>
DDMC	district disaster management committee	HAP	heat action plan
DEOC	District Emergency Operation Centre	HEDMU	Health Emergency and Disaster Management Unit
DHIS	District Health Information Software	HEOC	Health Emergency Operation Centre
DHM	Department of Hydrology and Meteorology, Nepal	HEWEAS	heatwave early warning and early action system
DRR	disaster risk reduction	HI	heat index
DRRM	disaster risk reduction and management	HMIS	health management information system
EDCD	Epidemiology and Disease Control Division, Ministry of Health and Population, Nepal	IBF	impact-based forecasting
EWARS	Early Warning, Alert and Response System	IFRC	International Federation of Red Cross and Red Crescent Societies
EWS	early warning system	IIASA	International Institute for Applied Systems Analysis
		IITM	Indian Institute of Tropical Meteorology

ILO	International Labour Organization	NOAA	National Oceanic and Atmospheric Administration
IMD	India Meteorological Department		
IPCC	Intergovernmental Panel on Climate Change	NRCS	Nepal Red Cross Society
ISCT	Institute for Social and Environmental Transition	NSO	National Statistics Office
LAPA	local adaptation plans of action	PEOC	provincial emergency operation centre
LED	light-emitting diode	PHEOC	provincial health emergency operation centre
LEOC	local emergency operation centre	RAIN	<i>Resilience, Adaptation, and Inclusion in Nepal</i>
LG	local government	RCP	representative concentration pathway
LSE	London School of Economics and Political Science	RIMES	Regional Integrated Multi-Hazard Early Warning System
MoAFE	Ministry of Agriculture, Forest and Environment	SAHF	South Asia Hydromet Forum
MoHA	Ministry of Home Affairs	SEAP	simplified early action protocols
MoHP	Ministry of Health and Population	SOP	standard operating procedure
NAP	<i>National Adaptation Plan</i>	SSP	shared socioeconomic pathway
NDRR	Nepal Disaster Risk Reduction	UNEP	United Nations Environment Programme
NDRRMA	National Disaster Risk Reduction and Management Authority	UTC	Coordinated Universal Time
NEOC	National Emergency Operation Centre	WHO	World Health Organization
NGO	nongovernmental organisation	WMO	World Meteorological Organization
NHSSP	<i>Nepal Health Sector Strategic Plan</i>	WRF	Weather Research and Forecasting
		WRFDA	Weather Research and Forecasting Data Assimilation
		ZCRA	Zurich Climate Resilience Alliance

References

- Agarwal, Neha, Ajay Nagpure, and Anu Ramaswami. 2024. "Studying Extreme Heat and Social Inequality in Global South Cities: Recommendations for Cross-Cultural Research." *One Earth* 7, (8): 1324–29. <https://www.sciencedirect.com/science/article/pii/S2590332224003750>.
- AIDMI (All India Disaster Mitigation Institute). 2024. "Postcolonial Disaster Risk Reduction in Nepal: Insights from the Disaster Preparedness Network (DPNet) Experience." All India Disaster Mitigation Institute. <https://aidmi.org/blog/postcolonial-disaster-risk-reduction-in-nepal-insights-from-the-disaster-preparedness-network-dpnet-experience/>.
- Bhandari, Dinanath, Pratap Maharjan, Kriti Bhuj, and Anna Renfrew. 2025. *Extreme Heat in Nepal: Risks and Response*. Zurich Climate Resilience Alliance and Mercy Corps Nepal. <https://www.mercycorps.org/sites/default/files/2025-09/extreme-heat-nepal-policy-brief.pdf>.
- Bhatta, Kusumsheela, and Sandip Pahari. 2021. "Vulnerability to Heat Stress and Its Health Effects Among People of Nepalgunj Sub-Metropolitan." *Journal of Nepal Health Research Council* 18 (4): 763–68. <https://pubmed.ncbi.nlm.nih.gov/33510525/>.
- Dhara, Chirag, Aditi Deshpande, Mathew Koll Roxy, Padmini Dalpadado, and Mandira Singh Shrestha. 2025. "A Post-AR6 Update on Observed and Projected Climate Change in India." *PLOS Climate* 4 (11): e0000724. <https://doi.org/10.1371/journal.pclm.0000724>.
- Dhimal, Meghnath, Mandira Lamichhane Dhimal, Raja Ram Pote-Shrestha, David A. Groneberg, and Ulrich Kuch. 2017. "Health-Sector Responses to Address the Impacts of Climate Change in Nepal." *WHO South-East Asia Journal of Public Health* 6 (2): 9–14. <https://pubmed.ncbi.nlm.nih.gov/28857057/>.
- Dhimal, Meghnath, Bikash Nepal, Bihungum Bista, et al. 2018. *Assessing Trends of Heat Waves and Perception of People about Health Risks of Heat Wave in Nepal*. Kathmandu: Nepal Health Research Council. <https://nhrc.gov.np>.
- DHM (Department of Hydrology and Meteorology). 2024a. *Hydrology and Meteorology Policy, 2024*. Department of Hydrology and Meteorology, Government of Nepal. <https://dhm.gov.np/pages/legislation>.
- DHM (Department of Hydrology and Meteorology). 2024b. *Preliminary Precipitation and Temperature Summary, June 2024*. DHM Climate Division, Government of Nepal. https://dhm.gov.np/uploads/dhm/climateService/June_2024-Preliminary_precipitation_and_temperature_summary.pdf.
- DHM (Department of Hydrology and Meteorology). 2024c. *Climate Change Scenarios for Nepal, 2024*. Department of Hydrology and Meteorology, Government of Nepal. https://www.dhm.gov.np/uploads/dhm/climateService/Climate_change_scenarios_for_Nepal_2024_compressed.pdf.
- DHM (Department of Hydrology and Meteorology). 2025. *State of the Climate of Nepal 2024*. Department of Hydrology and Meteorology, Government of Nepal. https://dhm.gov.np/uploads/dhm/climateService/1766473731_86708e798463fe298b78.pdf.
- DHM (Department of Hydrology and Meteorology). 2026a. *State of the Climate of Nepal 2025*. Department of Hydrology and Meteorology, Government of Nepal. https://dhm.gov.np/uploads/dhm/climateService/1777360855_cde386661a4216e39437.pdf.
- DHM (Department of Hydrology and Meteorology). 2026b. "Daily Weather Summary." Department of Hydrology and Meteorology, Government of Nepal. <https://dhm.gov.np/climate-services/daily%20weather%20summary/2026>.
- DHM (Department of Hydrology and Meteorology). n.d.a. "About Us." Department of Hydrology and Meteorology, Government of Nepal. Accessed August 20, 2026. <https://dhm.gov.np/pages/about-us>.
- DHM (Department of Hydrology and Meteorology). n.d.b. "Heat and Cold Wave Monitoring." Department of Hydrology and Meteorology, Government of Nepal. Accessed August 20, 2026. <https://dhm.gov.np/climate-services/heat-and-cold-wave-monitoring>.
- DHM (Department of Hydrology and Meteorology), Government of Nepal. n.d.c. "Meteorological Forecasting Division (MFD)." Department of Hydrology and Meteorology, Government of Nepal. Accessed August 20, 2026. <https://dhm.gov.np/mfd/#/>.
- EDCD (Epidemiology and Disease Control Division). 2026. "Surveillance of Communicable Disease Program." Epidemiology and Disease Control Division, Ministry of Health and Population, Government of Nepal. Accessed September 23, 2026. <https://edcd.gov.np/section/surveillance-of-communicable-disease-program>.
- FAO (Food and Agriculture Organization of the United Nations). 2026. "Nepal at a Glance." FAO in Nepal. Last modified June 19, 2026. <https://www.fao.org/nepal/our-office/nepal-at-a-glance/en>.
- GCF (Global Climate Fund). 2024. "SAP038: Climate Adaptation, Resilience and Engagement in Local Governments (CARE-LG)." Global Climate Fund. <https://www.greenclimate.fund/portfolio/projects/sap038>.
- GHHIN (Global Heat Health Information Network). n.d. "About Us." Accessed September 21, 2026. <https://heathealth.info/about-us/>.

- GHIN (Global Heat Health Information Network) and CEEW (Council on Energy, Environment and Water). 2026. "New South Asia Heat and Health Hub Launched to Strengthen Regional Response to Extreme Heat." Global Heat Health Information Network. <https://heathealth.info/news/south-asia-hub-launched/>.
- Giri, Monika, Ganga Bista, Pramod K. Singh, and Rajiv Pandey. 2021. "Climate Change Vulnerability Assessment of Urban Informal Settlers in Nepal, a Least Developed Country." *Journal of Cleaner Production* 307: 127213. <https://doi.org/10.1016/j.jclepro.2021.127213>.
- IFRC (International Federation of Red Cross and Red Crescent Societies). 2022. "Heat Action Posters in Nepal – Heat Action Day 2022." International Federation of Red Cross and Red Crescent Societies. <https://preparecenter.org/toolkit/heat/heat-action-posters/nepali/>
- IFRC (International Federation of Red Cross and Red Crescent Societies). 2025. "Nepal: Urban Heatwave — Simplified Early Action Protocol." International Federation of Red Cross and Red Crescent Societies. <https://www.ifrc.org/appeals>.
- ILO (International Labour Organization). 2019. Working on a Warmer Planet: The Impact of Heat Stress on Labour Productivity and Decent Work. International Labour Organization. https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@dgreports/@dcomm/@publ/documents/publication/wcms_711919.pdf.
- IPCC (Intergovernmental Panel on Climate Change). 2019. "High Mountain Areas." Special Report on the Ocean and Cryosphere in a Changing Climate. Intergovernmental Panel on Climate Change. https://www.ipcc.ch/site/assets/uploads/sites/3/2019/11/06_SROCC_Ch02_FINAL.pdf.
- IPCC (Intergovernmental Panel on Climate Change). 2022. "Climate Change 2022: Impacts, Adaptation and Vulnerability." Intergovernmental Panel on Climate Change. <https://www.ipcc.ch/report/ar6/wg2/>.
- Karki, Ramchandra, Rocky Talchabadel, Juha Aalto, and Sarju Kumar Baidya. 2020. "Rising Mean and Extreme Near-Surface Air Temperature Across Nepal." *International Journal of Climatology* 40 (5): 2445–63. <https://doi.org/10.1002/joc.6344>.
- Khadka, Nitesh, Xiaoqing Chen, Shankar Sharma, and Bhaskar Shrestha. 2023. "Climate Change and Its Impacts on Glaciers and Glacial Lakes in Nepal Himalayas." *Regional Environmental Change* 23: 143. <https://doi.org/10.1007/s10113-023-02142-y>
- Khan, Ramiz, Ashma Subedi, and Mirjam Grünholz. 2025. "Missed Warnings, Missed Opportunities": Optimising Heat Alert Communication for Community Resilience in Dhangadhi City, Nepal. Fact sheet. Red Cross Red Crescent Climate Centre. https://nrcs.org/wp-content/uploads/2025/05/4.2Web-version_Fact-sheet_1_Heat-Alert-Communication-Factsheet_V4.pdf.
- Khan, Ramiz, Roop Singh, Ffion McEvoy, Clemens Gros, and Madhab Uprety. 2026. The Lived Experiences of Vulnerable Populations in the Context of Extreme Heat: A Comprehensive Narrative Report Based on Survey Data from Five Cities in Bangladesh and Nepal. American Red Cross, Red Cross Red Crescent Climate Centre, Nepal Red Cross Society, and Bangladesh Red Crescent Society. <https://preparecenter.org/wp-content/uploads/2026/09/Bangladesh-Nepal-heat-risk-perception-study.pdf>.
- Khanal, Sundeepa, Tabea Schubert, Melanie Boeckmann, and Fabienne Pradella. 2025. "Assessing Health Facility Preparedness in Nepal for Addressing Climate-Related Disasters and Climate-Sensitive Diseases." *Frontiers in Climate* 7: 1625829. <https://doi.org/10.3389/fclim.2025.1625829>.
- Kharel, Arya. 2026. "Reassessing Nepal's Heat Wave Response: Lessons from 2024 and the Way Forward." OnlineKhabar English, June 10, 2026. <https://english.onlinekhabar.com/reassessing-nepals-heat-wave-response-lessons-from-2024-and-the-way-forward.html>
- Khatrī, Dil B., Andrea J. Nightingale, Hemant Ojha, Gyanu Maskey, and Pema Norbu Lama Tsumpa. 2022. "Multi-Scale Politics in Climate Change: The Mismatch of Authority and Capability in Federalizing Nepal." *Climate Policy* 22 (8): 1084–96. <https://doi.org/10.1080/14693062.2022.2090891>.
- Kim, Jeeyon Janet, Elizabeth Stites, Patrick Webb, Mark A. Constanas, and Daniel Maxwell. 2019. "The Effects of Male Out-Migration on Household Food Security in Rural Nepal." *Food Security* 11 (3): 719–732. <https://doi.org/10.1007/s12571-019-00919-w>
- Kovats, R. Sari, and Shakoor Hajat. 2008. "Heat Stress and Public Health: A Critical Review." *Annual Review of Public Health* 29: 41–55. <https://doi.org/10.1146/annurev.publhealth.29.020907.090843>
- Krishnan, R., J. Sanjay, C. Gnanaseelan, M. Mujumdar, A. Kulkarni, and S. Chakraborty. 2021. "Correction to: Assessment of Climate Change over the Indian Region." In *Assessment of Climate Change over the Indian Region*, edited by Krishnan, R., J. Sanjay, C. Gnanaseelan, M. Mujumdar, A. Kulkarni, and S. Chakraborty. Springer. https://doi.org/10.1007/978-981-15-4327-2_13.
- Lehtman, Salomé, and Sally Tyldesley. 2026. Pathways to Locally Led Adaptation: Lessons for Effective Climate Resilience Finance. Zurich Climate Resilience Alliance. <https://www.mercycorps.org/sites/default/files/2026-06/zcra-pathways-locally-led-adaptation.pdf>.
- Mercy Corps Nepal. 2025. Heatwave Impact and Coping Strategies in Public Schools of Madhesh Province: A Perception Study. Climate Resilience for Communities (CRC) and Zurich Climate Resilience Alliance. <https://www.mercycorps.org/sites/default/files/2025-05/heat-study-final-report-jun-2025.pdf>.
- Mercy Corps Nepal. 2026. "Stay Home or Feed Your Family: Nepal's Heat Crisis Is Now an Income Emergency." Press release. Mercy Corps Nepal. <https://www.mercycorps.org/press-room/releases/Statement-Extreme-Heat-Nepal>.

MoAFE (Ministry of Agriculture, Forest and Environment). 2019. Climate Change Scenarios for Nepal for the National Adaptation Plan (NAP). Ministry of Agriculture, Forest and Environment, Government of Nepal. <https://www.climatenepal.org.np/resources/climate-change-scenarios-nepal>.

MoAFE (Ministry of Agriculture, Forest and Environment). 2021. National Adaptation Plan (NAP) 2021–2050. Ministry of Agriculture, Forest and Environment, Government of Nepal. https://unfccc.int/sites/default/files/resource/NAP_Nepal_2021.pdf.

MoHA (Ministry of Home Affairs). 2022. Risk to Resilience: Disaster Risk Reduction and Management in Nepal. Position paper presented at the Seventh Session of the Global Platform for Disaster Risk Reduction. Ministry of Home Affairs, Government of Nepal. https://dpnet.org.np/uploads/files/Nepal_Position%20Paper_GPDRR2022_Final%202022-05-26%2016-58-49.pdf.

MoHA (Ministry of Home Affairs), Government of Nepal. 2025. Nepal Position Paper for GP2025. Ministry of Home Affairs, Government of Nepal. <https://www.dpnet.org.np/uploads/files/Nepal%20Position%20Paper%20for%20GP%202025%202025-06-01%2011-02-55.pdf>.

MoHP (Ministry of Health and Population), Government of Nepal. 2025. Annual Health Report 2080/81. Ministry of Health and Population, Government of Nepal. https://hmis.gov.np/media/40/Annual-Health-Report-208081_compressed.pdf

NDRRMA (National Disaster Risk Reduction and Management Authority). 2024. Plan of Action for Risk Reduction and Response on Measures for Protection from Heat Wave. National Disaster Risk Reduction and Management Authority, Government of Nepal. <https://dpnet.org.np/uploads/files/Heatwaved%20related%202081In%20english%202024-06-11%2009-40-14.pdf>.

NDRRMA (National Disaster Risk Reduction and Management Authority). 2026a. National Action Plan for Preparedness, Pre-Emptive Action and Rapid Response to Extreme Heat or Heat Wave (Loo) and Drought, 2026. National Disaster Risk Reduction and Management Authority, Government of Nepal. <https://ndrrma.gov.np/en/all-publications/244>.

NDRRMA (National Disaster Risk Reduction and Management Authority), Government of Nepal. 2026b. “National Framework for Anticipatory Action, 2026.” National Disaster Risk Reduction and Management Authority, Government of Nepal. <https://ndrrma.gov.np/en/procedure/250>.

Neupane, Sanchita. 2025. “Heat Early Action 2025: Opportunities and Lessons Learned from Nepal.” People in Need, RAIN Programme. https://www.sahf.info/wp-content/uploads/sahf-events/ibf-toolkit-workshop-nov-2025/presentations/Session-18-RAIN-Practitioners-Perspective_SS.pdf.

NRCS (Nepal Red Cross Society). 2025. Leading Change Through Heat Action: Initiative to Prepare For, Respond to and Reduce Heat Risks. Nepal Red Cross Society. <https://preparecenter.org/wp-content/uploads/2025/05/Nepal-Heat-Action-Leaflet-Aug24.pdf>.

NSO (National Statistics Office). 2023. National Population and Housing Census 2021. National Statistics Office, Government of Nepal. <https://censusresults.nsonepal.gov.np/household>.

People in Need. 2025. “Resilience, Adaptation, and Inclusion in Nepal (RAIN) Programme.” <https://www.preventionweb.net/media/116872/download?startDownload=20260808>.

Prabhu, Shravan, Keerthana Anthikat Suresh, Srishti Mandal, Divyanshu Sharma, and Vishwas Chitale. 2025. How Extreme Heat Is Impacting India: Assessing District-Level Heat Risk. Council on Energy, Environment and Water. <https://www.ceew.in/sites/default/files/mapping-climate-risks-and-impacts-of-extreme-heatwave-disaster-in-indian-districts.pdf>.

Reddy, Venkat S., Helen Ross, and Yibeltal Alemu. 2026. “Enablers and Barriers for Climate Resilient Health Systems: Lessons from a Qualitative Study in Nepal.” *The Journal of Climate Change and Health* 28: 100623. <https://doi.org/10.1016/j.joclim.2025.100623>.

RIMES (Regional Integrated Multi-Hazard Early Warning System). 2026. “RIMES Supports Nepal’s National Demonstration of IBF for Heat Extremes.” <https://www.rimes.int/rimes-supports-nepals-national-demonstration-of-ibf-for-heat-extremes/>.

Romanello, Marina, Maria Walawender, Shih-Che Hsu, et al. 2025. “The 2025 Report of the Lancet Countdown on Health and Climate Change: Climate Change Action Offers a Lifeline.” *The Lancet* 406: 2804–2857. [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(25\)01919-1/abstract](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(25)01919-1/abstract).

Sharma, Sudim, Sabina Marasini, Anjali Joshi, et al. 2025. “Exploring Outdoor Workers’ Knowledge, Attitudes, Practices, and Perceived Risks of Heatwaves in Nepal.” *PLoS ONE* 20 (8): e0329557. <https://doi.org/10.1371/journal.pone.0329557>.

Shaw, Rajib, Yong Luo, Tae Sung Cheong, et al. 2022. “Asia.” In *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, edited by Hans-Otto Pörtner, Debra C. Roberts, Melinda Tignor, Elvira S. Poloczanska, Katja Mintenbeck, Andrés Alegría, Marlies Craig, Stefanie Langsdorf, Sina Löschke, Vincent Möller, Andrew Okem, and Bardhyl Rama, 1457–1579. Cambridge University Press. <https://doi.org/10.1017/9781009325844.012>.

Shrestha, Adhrit. 2022. “Key Highlights from the Census Report 2021.” Nepal Economic Forum. <https://nepaleconomicforum.org/key-highlights-from-the-census-report-2021/>.

- Shrestha, Srijan Lal. 2018. "Negative Binomial Model in Linking Water-Borne and Vector-Borne Disease Hospitalizations with Climate Sensitive Variables in Nepal." *Nepalese Journal of Statistics* 2: 11–26. <https://doi.org/10.3126/njs.v2i0.21152>.
- Singh, Rina, and Anil Subedi. 2022. "Reducing Heat Impacts in Nepalgunj City, Nepal." *Global Heat Health Information Network (GHHIN) and Red Cross Red Crescent Climate Centre*. <https://ghhin.org/resources/reducing-heat-impacts-in-nepalgunj-city-nepal/>.
- Subedi, Ashma, Ramiz Khan, Ahmadul Hassan, and Sanne Hogesteeger. 2022. Identification of Heat Threshold and Heat Hotspots in Nepalgunj, Nepal. Red Cross Red Crescent Climate Centre. <https://cdkn.org/sites/default/files/2022-04/RCCC%20Heat%20Threshold%20Report-Nepalgunj%2C%20Nepal.pdf>.
- Subedi, Ashma, Ramiz Khan, and Roop Singh. 2023. Nepalgunj Heat Action Plan 2023. Red Cross Red Crescent Climate Centre. <https://preparecenter.org/wp-content/uploads/2023/07/Nepalgunj-Heat-Action-Plan-2023.pdf>.
- Subedi, Ashma, Ramiz Khan, and Mirjam Grünholz. 2025. "Under the Scorching Sun": Women's Experiences of Extreme Heat in Dhangadhi, Nepal. Red Cross Red Crescent Climate Centre. <https://ifrc.souttron.net/public/DownloadImageFile.ashx?objectId=30168&ownerType=0&ownerId=31355>
- Thapa, Roshan, Sachita Shrestha, Dinesh Neupane, Janavi Wagle, and Pinky Jha. 2026. "Heat Stress and Non-Traditional Chronic Kidney Disease (CKDnT) among Nepali Migrant Workers: A Climate-Sensitive Global Health Perspective." *Cureus* 18 (5): e108607. <https://doi.org/10.7759/cureus.108607>.
- UNEP (United Nations Environment Programme). 2026. Limiting Overshoot: Navigating Exceedance of 1.5°C and Pathways towards Return. United Nations Environment Programme. <https://wedocs.unep.org/items/156d074c-ab1d-4833-acf8-6343589ede9b>.
- Venugopal, Vidhya, Rekha Shanmugam, and Latha Perumal Kamalakkannan. 2021. "Heat-Health Vulnerabilities in the Climate Change Context—Comparing Risk Profiles between Indoor and Outdoor Workers in Developing Country Settings." *Environmental Research Letters* 16 (8): 085008. https://doi.org/10.1088/1748-9326/ac1469?urlappend=%3Futm_source%3Dresearchgate.net%26utm_medium%3Darticle
- Vij, Sumit, Caroline Russell, Julian Clark, Binod Prasad Parajuli, Puja Shakya, and Art Dewulf. 2020. "Evolving Disaster Governance Paradigms in Nepal." *International Journal of Disaster Risk Reduction* 50: 101911. <https://doi.org/10.1016/j.ijdrr.2020.101911>.
- Wasti, Sharada Prasad, Edwin van Teijlingen, Simon Rushton, et al. 2023. "Overcoming the Challenges Facing Nepal's Health System during Federalisation: An Analysis of Health System Building Blocks." *Health Research Policy and Systems* 21 (1): 117. <https://doi.org/10.1186/s12961-023-01033-2>.
- WMO (World Meteorological Organization). 2025. "State of the Climate Update for COP30." World Meteorological Organization. <https://wmo.int/news/media-centre/2025-set-be-second-or-third-warmest-year-record-continuing-exceptionally-high-warming-trend>.
- World Bank. 2025. "Bangladesh Faces Health and Economic Risks from Rising Temperature." Press release. World Bank. <https://www.worldbank.org/en/news/press-release/2025/09/16/bangladesh-faces-health-and-economic-risks-from-rising-temperature-world-bank>.
- World Bank. 2026. A Livable Future: Protecting Jobs and Growth from Extreme Heat in South Asia's Cities. World Bank. <http://documents.worldbank.org/curated/en/099072226125517919>.
- Zurich Climate Resilience Alliance (ZCRA). 2025. "Nepal Country Brief." Zurich Climate Resilience Alliance. <https://zcralliance.org/resources/item/nepal-country-brief/>.



The authors



Anushka Goswami

Programme Officer for the GHHIN South Asia Hub

anushka.goswami@ceew.in

 Anushka Goswami

Anushka works as a Research Analyst in the Climate Resilience team, specialising in Disaster Policy and Action. Her research interests include differential vulnerability assessment, Himalayan disaster risk, and community-based disaster risk reduction. Her work spans research, stakeholder management, and strategic communications.



Shruti Nikhar

Strategic Partnerships for the GHHIN South Asia Hub

shruti.nikhar@ceew.in

 Shruti Nikhar

Shruti is a Senior Engagement Associate with the Climate Resilience team. Her work is positioned at the intersection of climate change adaptation and disaster protection, spanning research and strategic partnerships. She has previously contributed to interdisciplinary research projects globally and led disaster rehabilitation projects across India.



Shravan Prabhu

Hub Coordinator for the GHHIN South Asia Hub

shravan.prabhu@ceew.in

 Shravan Prabhu

Shravan is a Programme Lead with the Climate Resilience team at The Council. His research primarily focuses on quantifying physical climate risks through an integrated analysis of climate, geospatial, and socioeconomic data. His research contributes to the development of subnational climate policies such as heat action plans and developing risk-informed decision-making tools.



Vishwas Chitale

Chair for the GHHIN South Asia Hub

vishwas.chitale@ceew.in

 Vishwas Chitale

Vishwas leads the Climate Resilience team at The Council, where his work focuses on assessing risks and building resilience. He has over 15 years of experience in developing and implementing digital solutions for climate change risk reduction and resilience building in various South Asian countries. He previously worked on AI for Climate Change and on assessing the vulnerability of forest ecosystems.



Council on Energy, Environment and Water (CEEW)

ISID Campus, 4 Vasant Kunj Institutional Area
New Delhi - 110070, India

T: +91 11 4073 3300

info@ceew.in | ceew.in |  @CEEWIndia |  ceewIndia



 Scan to read the full study