Sarekha Chaurasia packs disposable cutlery from the tiny one-room home she shares with her family of six in Bhagwati Nagar, an informal settlement in Ahmedabad in the western state of Gujarat in India. Like most homes in India’s low-income neighbourhoods, Chaurasia’s has a cement roof. She would feel the first signs of the suffocating heat when the plastic spoons she had to pack would warm up. “I had low blood pressure, dizziness, itchiness, fatigue, fever and diarrhoea in the summers,” she said. Due to the heat, her family members also fell ill frequently.

Chaurasia’s family has two fans and an air cooler, but they were not enough to cool her home. “It was impossible to eat inside, so we sat outside the house for our meals. The children would sit outdoors all day long and even studied there. During work, I took small breaks to sit under the shade of a tree,” she said.

Like many of the poorest people in South Asia, Chaurasia and her family were suffering from heat stress. Heat stress occurs when the human body heats up excessively, causing dehydration, inability to focus, dizziness and extreme fatigue, among other symptoms. It is a growing concern in India, a country with a hot tropical climate and the monsoon, a wind system that brings heavy rainfall. During the monsoon, high humidity can cause heat stress despite relatively low temperatures.

The year 2021 was the fifth-warmest in India since 1901, according to the India Meteorological Department. India is also prone to heatwaves between March and July, peaking in May. There has been a significant increase in the average number of heatwave days in the country. Not only are the heatwaves becoming more severe, but they are also happening at new locations – north-western, central and south-central parts of the country. Of the 50 cities that are most affected by heat stress around the world, 17 are in India, including Delhi and Kolkata, which are placed second and third in the list.

Moetasim Ashfaq, a scientist at Oak Ridge National Laboratory, Tennessee, co-authored a study, published in 2021, which projected that deadly heat stress will become common across South Asia already at 1.5°C of global warming. The study found that demographic factors such as the high density of population in cities and the large number of people who work outdoors in agriculture make South Asian countries more vulnerable to heat stress. “These hot temperatures will be achieved before 2050,” warns Ashfaq. “We don’t have much time for adaptation. There are a lot of people working outside, many of whom are below the poverty line and homeless. The world has to aggressively reduce global mean temperature.”

If heat stress and climate breakdown are burning issues for marginalised groups in India, why are people not more angry about it? When Disha Ravi, a climate activist with Fridays For Future India, began talking to domestic workers and labourers near her house in Bangalore, she noticed that often women were the sole breadwinners and also faced abuse at home. “They just have to put food on the table. They can’t afford the privilege of considering heat stress,” she said. “In the general climate agenda, heat stress is relatively low priority. This is because in India, issues related to the environment itself are of low priority. Also, in some parts of India, flooding and air pollution are more of a problem that feel more life-threatening. So people don’t talk about heat stress.”

Yuvan Aves, an ecological activist based in Chennai, thinks it is necessary to develop climate change terminology in regional languages like Tamil. “There are no words for climate change in regional languages like Tamil. When you know the name of something, you can have a relationship with it,” he said.

At a policy level, the Indian government has taken notice of the increasing heat stress. The first Heat Action Plan was made by the city of Ahmedabad after it experienced a deadly heatwave in 2010. This later led to the creation of a National Heat Action Plan in 2015. In 2021, India also created a National Action Plan on Heat Related Illnesses. Yet the state has initiated no large-scale solutions on the ground.

For now, solutions to heat stress are coming from non-profits and social enterprises. In 2009, Mahila Housing Trust (MHT), a non-profit based in Ahmedabad, started working on cooling solutions for people living in poverty in the city. “We did a baseline survey on energy usage in homes and found out that the residents had very high energy bills. Their homes lacked ventilation and natural light,” said Bhavna Maheriya, programme manager at MHT. MHT also conducted a study that showed how increased indoor temperatures adversely affected the

“There are no words for climate change in regional languages like Tamil”
productivity of women who worked from home, reducing it by 50% during summer afternoons. This meant less income, which further drove them into poverty.

“It has never been ... more important for humanity to anticipate the consequences of our continued reliance on phenomena such as fossil fuels and unsustainable manufacturing processes... Can we now rise to this epoch-defining challenge and safeguard the planet for the sake of our descendants?”

Chief Rabbi Ephraim Mirvis

MHT offers a variety of heat-resilient roofing technologies through microloans granted by its credit cooperative. These include solar-reflective paint, which reduces indoor temperature by 4–5 degrees and costs around 25 rupees per square foot. Typically, a 100-square-foot roof requires 8 kilos of paint. Using this product on her home has helped Surekha Chaurasia live with the heat in Bhagwati Nagar. “Now my children are able to study indoors and the family’s health has improved. Even our relatives visit us often because their own homes are too hot,” she said.

So far, MHT has been able to work on the roofs of 17,000 homes in six Indian states – Gujarat, Madhya Pradesh, Rajasthan, Maharashtra, Jharkhand and Uttar Pradesh – and the city of Delhi, and has also shared the technical knowledge with organisations in Bangladesh and Nepal. Ashden, a UK-based non-profit that works on climate solutions, recognised MHT in 2021 for its work on cool roofs. “We find that solar-reflective paint is the most effective and its price is still not so high. Its cooling effect lasts for at least two years and it is a very easy-to-implement solution,” said Maheriya.

“Balance, a social enterprise based in Pune, began work on thermal comfort in informal housing in 2021. The organisation partnered with two non-profits – Mashal in Pune, and Hasiru Dala in Bangalore – to visit households in order to understand how people were coping with heat. “We invited residents to attend a participatory design workshop, and, based on the community’s feedback, we modified the designs,” said Vinuta Rodrigues, project assistant at cBalance. In October and November 2021, they made 14 installations using six cooling methods – aluminium foil, water-filled PET bottles, wood wool, rooftop gardening and dormer windows, working with local metal fabricators and architectural colleges to implement these ideas.

The current roof-cooling solutions are just the beginning. For adaptation to happen at ground level, there needs to be a collaborative model where governments, corporates, universities, non-profits and communities work together. For instance, MHT’s work has inspired Ahmedabad Municipal Corporation to announce that it will provide solar-reflective paint to 15,000 homes in its Heat Action Plan. South Asian countries also have to start planning solutions according to the latest heat-stress projections, keeping in mind the needs of women, children and older, ill and disabled people. Governments also need to create shelters for homeless people.

“I feel anxious about the future. If we keep spreading awareness, there will be a solution and we might find some relief. Nowadays we are planting trees and taking care of them,” said Chaurasia, who now works as a community leader with MHT and speaks to women in the community about cooling their homes.

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Laoliben Chavda upgraded to a bamboo roof with a loan from the Mahila Housing Trust. Photo courtesy of Mahila Housing Trust.