

EXTREME HEAT LOSS AND DAMAGE: Small Business Evidence from India

Introduction

Extreme heat is emerging as one of the most significant climate risks facing India's informal economy. While heat-related mortality is increasingly recognised, far less attention has been paid to the loss and damage experienced by small businesses whose livelihoods depend on daily income, outdoor work, and limited financial reserves.

To address this gap, the All India Disaster Mitigation Institute (AIDMI) conducted a study across Ahmedabad, Guwahati, Kolkata, Rewa, and Cochin. The study examined how extreme heat affects income, health, productivity, expenditure, adaptation, and recovery among 150 small businesses operating in diverse climatic and livelihood contexts.

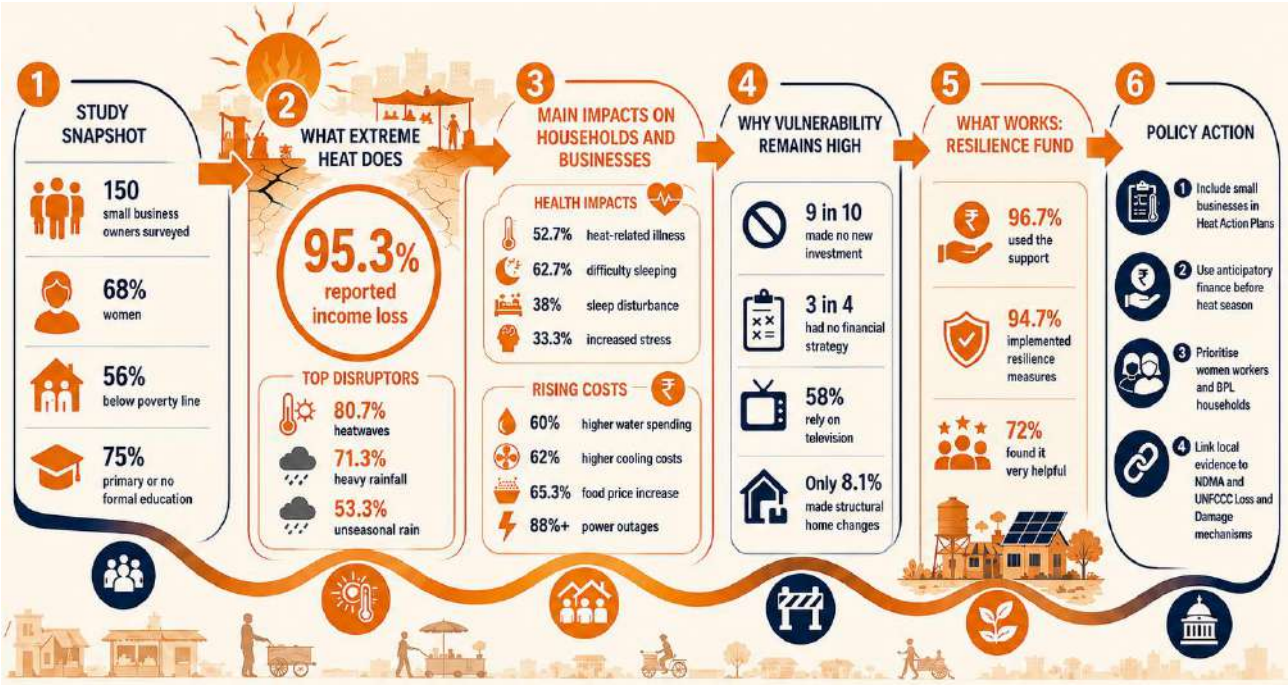
The study was supported under the SIDRRA (Strengthening Inclusive Disaster Risk Governance for Climate Resilience in Asia) Project led by Duryog Nivaran. The findings contribute evidence to growing discussions on loss and damage, climate adaptation, and livelihood protection in South Asia.

The evidence is clear. Extreme heat is not only a health emergency. It is a livelihood emergency. It reduces income, increases household costs, weakens productivity, and erodes resilience over time.

Findings

Key Message: Heat-related loss and damage is already occurring among small businesses, but remains largely invisible within existing climate finance, compensation, and disaster response systems.

The study found that almost all respondents experienced income loss linked to extreme heat. At the same time, households faced increased



*This **visual summarises** key evidence from five cities, covering the respondent profile, income loss, heat-related health and business impacts, low adaptation capacity, benefits of Resilience Fund support, and priority policy actions for reducing avoidable loss and strengthening heat resilience.*

expenditure on water, cooling, food, and healthcare. These combined pressures create a cycle where income falls precisely when expenditure rises.

For many respondents, adaptation remains constrained not by awareness but by resources. Most respondents had not invested in structural adaptation measures such as cooling improvements, roofing modifications, insulation, or ventilation systems. Behavioural adaptation was more common, including changing work hours, reducing outdoor activities, and limiting exposure during peak heat periods. While these measures help protect health, they often reduce productivity and earnings.

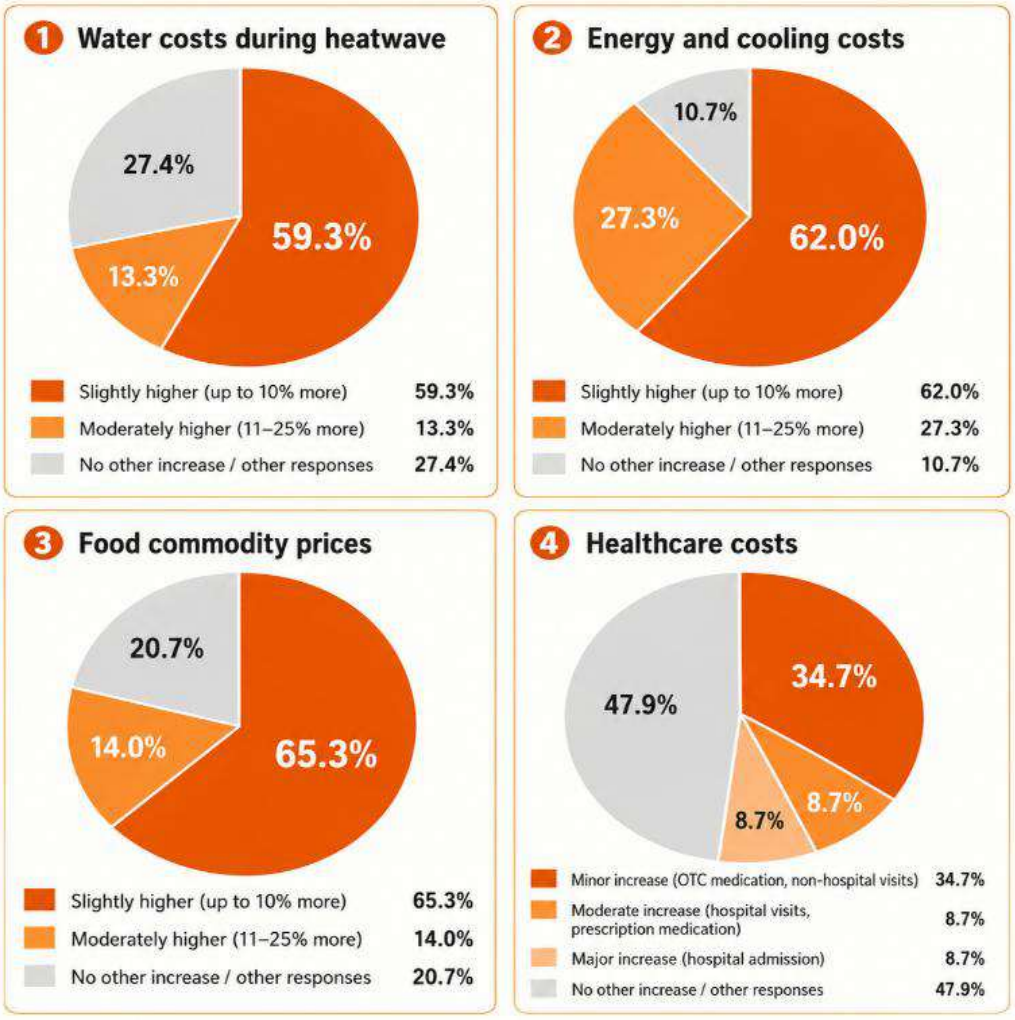
The findings show that small businesses experience both direct and indirect forms of loss and damage. Income disruption, product spoilage, health impacts, increased expenditure, reduced working hours, and service disruptions interact to create cumulative livelihood stress.

The study also examined how targeted support influences adaptation outcomes. Through AIDMI's Resilience Fund, small businesses were able to invest in practical measures such as refrigeration, shade structures, water facilities, cooling equipment, improved workspaces, and product protection.

> *"When the heat is too much, customers stop coming and fruits spoil faster. On those days, it feels like all our hard work melts away in the sun."*
>
> *— Ms. Surekha Patni, Ahmedabad.*

Respondents consistently reported improved working conditions, greater business safety, and increased preparedness after receiving support. Although these findings are based on self-reported experiences, they provide valuable evidence that small and flexible financial support can enable practical adaptation among businesses that are often excluded from formal climate finance.

Importantly, the findings demonstrate that adaptation has limits. Even after adopting adaptation measures, many businesses continue to experience income loss, health impacts, increased



Increased Household Expenditure Associated with Extreme Heat Among Small Business Households *(N = 150). Figure illustrates reported increases in water, energy and cooling, food, and healthcare expenditures during periods of extreme heat. Rising costs across these essential categories place additional financial pressure on small business households, compounding the direct income losses and livelihood impacts associated with heat-related disruptions. Together, these costs show how extreme heat affects both business continuity and household well-being.*

From Heat Stress to Stability — Nirmala Kewat, Rewa

Nirmala Kewat, a 35-year-old small business runner in Rewa, sells tea, snacks, and biscuits near Churahata Bypass. During peak heat hours, she experienced headaches, dizziness, and exhaustion. Heat also reduced customers and spoiled milk and snacks, creating direct financial loss. She said, "I often have to give up and go home early, losing money."

With resilience fund support, she installed a shade sheet, water container, and battery-operated fan. These measures helped her continue working during afternoon hours, reduced health stress, and made the stall more comfortable for customers. She said, "With the fan, I can keep working even during the peak hours, and I don't have to go home early anymore."

Key lesson: Low-cost adaptation can reduce health stress, protect income, and support the leadership of women in heat resilience.

Keeping Fish Fresh During Heat — Viji C. G., Cochin

Viji C. G., a fish seller in Ernakulam, faced direct livelihood losses during hot hours. Heat made fish spoil faster, increased smell, reduced customer footfall, and caused fatigue and headaches. She explained, "During the hot hours, it's difficult to work with fish, the smell becomes stronger, and people don't stop to buy."

With resilience fund support, Viji purchased a second-hand refrigerator to store cleaned and unsold fish safely during peak heat hours. This reduced spoilage, lowered pressure to sell quickly, and improved business continuity. She said, "Now I don't worry about fish getting spoiled quickly in the heat. I can work calmly, keep the fish fresh, and serve my customers better."

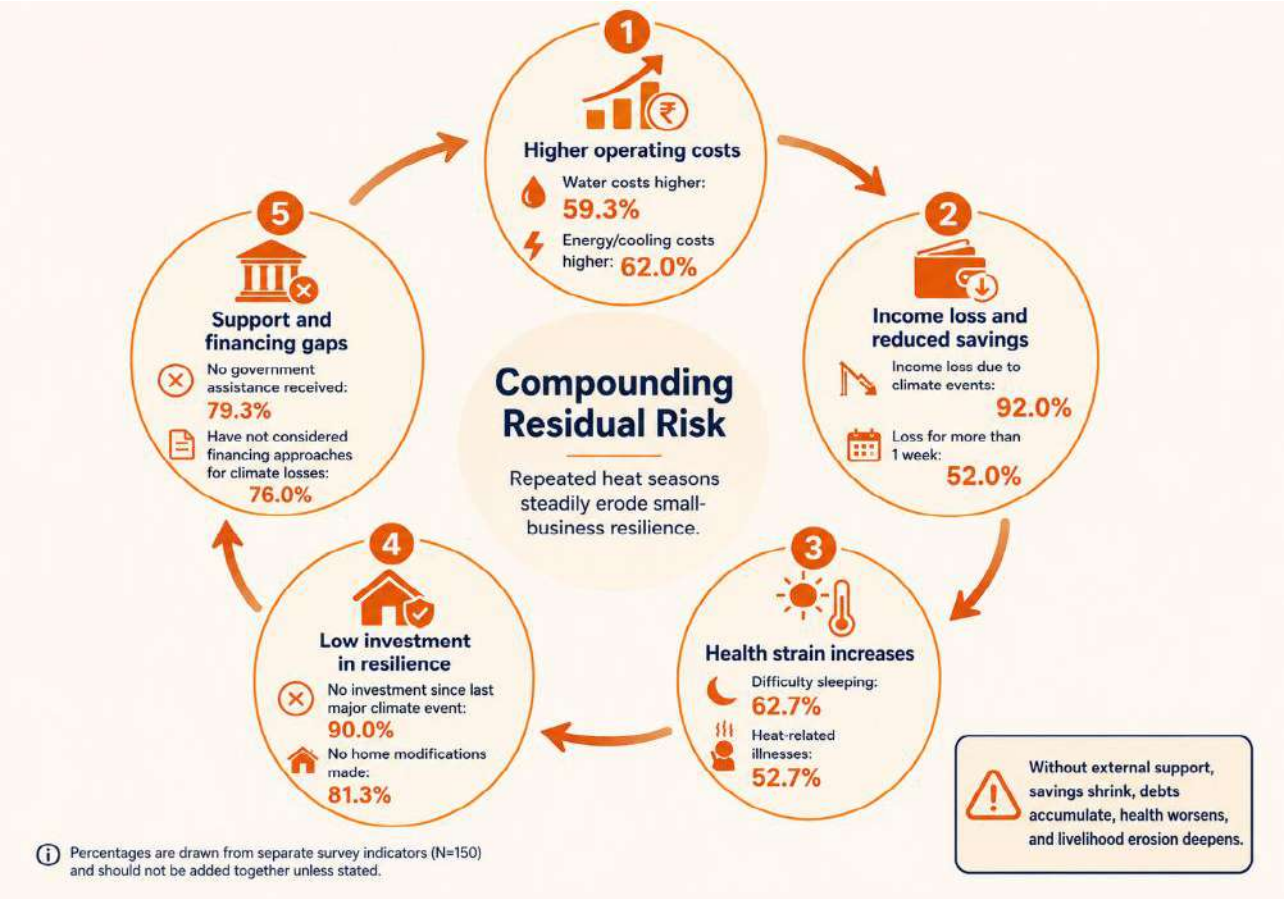
Key lesson: Low-cost cooling and storage support can reduce loss and damage for perishable-goods businesses.

expenditure, and operational disruption. These remaining impacts represent residual risk and indicate the need for additional support through climate finance, social protection, and loss and damage mechanisms.

The significance of this study extends beyond the five cities surveyed. It offers practical evidence on how loss and damage is experienced at the household and business level and demonstrates that locally managed adaptation finance can generate meaningful benefits for vulnerable populations.



*Self-Reported **Impact** of Resilience Fund Support Among Small Businesses (N = 150). The figure presents respondent-reported outcomes following Resilience Fund support, including fund utilisation, implementation of resilience measures, improved working conditions, contribution to business safety, helpfulness of funds, and preparedness for future risks. The results reflect perceptions and experiences reported by respondents.*



Residual Risk and the Limits of Adaptation for Small Businesses Facing Extreme Heat. The figure shows how repeated heat seasons can compound residual risk for small businesses through higher operating costs, income loss, health strain, low investment in resilience, and limited support or financing. It highlights that adaptation measures can reduce risk, but do not fully eliminate heat-related loss and damage, especially where small businesses lack timely finance, social protection, and institutional support.

Way Ahead

For donors and funders, the findings suggest that small-scale, flexible, and locally managed finance deserves greater attention. Investments in resilience funds, anticipatory finance, micro-grants, community savings mechanisms, cooling infrastructure, and longitudinal evidence generation can help reduce avoidable loss and strengthen adaptive capacity before impacts become irreversible.

For *Duryog Nivaran*, the study provides an opportunity to advance its long-standing commitment to alternative perspectives on disasters and vulnerability. The framework, methodology, and learning generated through this work can be adapted and tested in other locations across India and South Asia. Comparative studies, practitioner exchanges, policy dialogue, and regional learning platforms can help strengthen understanding of heat-related loss and damage among informal workers, small businesses, women entrepreneurs, and climate-vulnerable communities.

> *"The fan, ceiling, stove, and exhaust make my workspace more workable. Snacks stay fresh, and customers keep coming."*
>
> *— Ms. Suman Das, Guwahati.*

The study demonstrates that heat-related loss and damage is measurable, preventable in part, and increasingly urgent. The challenge now is to scale evidence, finance, and action at a pace that matches the growing risk.

Prepared under the SIDRRA Project of Duryog Nivaran.
Prepared by Vishal Pathak, Rohan Trivedi, and Aysha Imam of AIDMI.
For more information: Email: support@aidmi.org, Website: www.aidmi.org

May 2026.