



COUNTING THE COST OF HEAT: THE CASE FOR URGENT SOLUTIONS FOR CITIES

Deep-dive report series: Freetown, Sierra Leone

Extreme heat is becoming the norm in Freetown as climate change and urban heat island effects intensify year-round heat

Despite being a coastal city, Freetown's equatorial location means it is exposed to extreme heat year-round. Daily highs consistently range between 27-30°C (80-86°F), while humidity exceeds 90% for 11 months of the year. Nighttime provides little respite – average overnight temperatures remain over 23°C (74 °F) throughout the year.¹ Climate change is intensifying these baseline conditions by increasing the severity and frequency of hot days and nights, while rapid urban expansion is further amplifying heat exposure. Freetown's population has grown from 529,000 people in 1990 to 1.3 million in 2025,² driving deforestation within the city and its surrounding hinterlands and reducing the natural cooling effect of tree cover.³ Much of this growth has been in informal dwellings, which house 30% of Freetown's population, where construction materials such as corrugated iron and tin trap heat indoors and exacerbate thermal stress.

Freetown illustrates how persistent, year-round heat, in a city heavily reliant on outdoor employment and traditional food markets, can amplify risks for women in growing cities globally.

Isha's story demonstrates how extreme heat affects female outdoor and food system workers

Isha Mansaray is a petty trader and Chairlady of the Bombay Market in Freetown, a busy trading hub located in the eastern part of the city. In her work selling provisions, she is highly exposed to the impacts of heat – like 17 of Freetown's 42 markets, it is open air⁴, with no shade cover for vendors (a tarpaulin that previously protected the market was damaged by strong winds). As Isha explains, "Women suffer the most because they make up a huge number of the traders. We sit directly under the sun and experience the heat more than men." The heat not only affects her health and comfort, it also affects her livelihood – keeping customers away and spoiling her inventory.

¹ [Weather Spark](#)

² [The Guardian, 2024](#)

³ [BBC, 2023](#)

⁴ [Freetown City Council](#)



Isha has repeatedly become sick as she swelters in her stall, developing rashes in the daytime heat. “I don’t feel well selling under the sun,” she says. She is not alone. In an average year in Freetown, extreme heat is already responsible for 1% of deaths (2.5% of deaths in the hottest years) and 1% of work-related accidents. Heat-related admissions contribute to crowding in hospitals, which increases mortality by 43% in an already-strained healthcare system.⁵ Without action, this will only get worse – by 2050, heat-related deaths in Freetown are expected to increase nearly five-fold, claiming the lives of 30 in 100,000 people each year – greater than deaths today from cervical cancer, road injuries, malnutrition, or HIV/AIDS.⁶

At home, rapidly rising nighttime temperatures exacerbate the impacts on

Isha’s health. Informal settlements, like Isha’s, are made up of dwellings that typically lack proper ventilation and are often made of iron or tin sheets (in Freetown, 95% of slum residents use zinc corrugated iron sheets for housing⁷) which traps the heat from the day, giving Isha little opportunity to recover.⁸ To cope with nighttime heat, Isha uses a fan, although its noise disrupts her sleep. When there is no electricity, she opens the windows, which exposes her to mosquitoes and intruders. This disrupted sleep increases Isha’s susceptibility to heat the following day, leaving her less able to work productively and more vulnerable to heat-related illnesses and the economic pressures that heat places on her household.

⁵ [Sesay & Osborne \(2025\)](#)

⁶ Study calculations compared to estimates from [WHO, 2021](#)

⁷ [Freetown City Council](#)

⁸ [Carroscio-Tenezaca et al. \(2021\)](#)

The effects of heat compound across daily life, extending from health into livelihoods and food security. Heat affects food availability and affordability, which makes it harder for Isha to eat nutritiously during heatwaves. “I used to sell fish, but I stopped because of the lack of proper storage facilities.” She now sells provisions, but much of her inventory still is damaged (even packets of spaghetti go off on hot days). Up to 5% of Freetown’s daily food supply spoils during heatwaves, leading to price increases of over 2% – equivalent to a month’s worth of utility payments for an average family.⁹ This makes food less accessible for the poorest families, who spend the greatest share of their income on food.

“Without selling, I can’t support my family. I have several children to care for, and my business is how I pay their fees and provide daily meals.”

Extreme heat has lasting consequences for Isha and her family’s financial wellbeing. On hot days she spends Le 300 (\$13 – over 20% of her daily earnings) on basic coping measures like cold water to make the heat more bearable. At the same time, the heat depresses her income by causing inventory to spoil and reducing customer traffic in the market. Isha describes the toll heat takes on her customers: “In the afternoons, some customers even faint because of the extreme heat in the market.” The effects are immediate for her business as well: “In the mornings, sales are often good, we can make between Le 1,000 and 1,500 (\$43 to \$64). However, when the sun becomes too hot in the afternoon, our sales drop significantly, sometimes to just Le 400 or 500 (\$17 or \$21).”

Like many self-employed workers and business owners, Isha does not have fixed wages and benefits: if there are fewer customers or she works more slowly because of the extreme heat, her take-home earnings fall. Across Freetown, women in the informal sector lose 8% of their wages to heat-related productivity losses, approximately what they spend on fuel and light. Children bear much of the brunt of this: extreme heat reduces the average woman’s spending on her children by more than \$200. As Isha explains, “Without selling, I can’t support my family. I have several children to care for, and my business is how I pay their fees and provide daily meals.”

Individual impacts multiply to create broader macroeconomic scarring. The Sierra Leonean economy is highly dependent on Freetown – the city accounts for 35% of the country’s GDP and the Freetown port

⁹ [Statistics Sierra Leone \(2018\)](#)

handles 80% of its foreign trade.^{10,11} Heat reduces workforce productivity by 8% (13% in extreme years) – the equivalent of removing 38,000 jobs in a city of only 1.3 million. Lower economic output leads to reduced tax receipts and reduced public funding available for health, infrastructure, and development spending. Across Freetown, heat-related wage losses increase household indebtedness by 3% per year – up to 6% in extreme years. By comparison, the 2008/09 global financial crisis increased household indebtedness in Freetown by 2.6% per year (over 8 years).

Freetown can scale and build on its emerging heat policies to help women traders

Heat has become a policy priority in Freetown – the city appointed a Chief Heat Officer in 2023 (the first such position in Africa) and hosted the first African Urban Heat Summit in 2025, where it unveiled its Heat Action Plan.¹² The Heat Action Plan emphasizes preparedness, heat-adaptive solutions, and finance mobilization. Importantly, the plan highlights the importance of targeted action to reduce risks among women, people who live in informal settlements, and other vulnerable groups. Freetown is already working to implement heat-adaptive solutions: for example, many of Freetown’s markets are outdoors, so HERA is working with Freetown to install sturdy market shade covers that are equipped with solar lighting to light streets after dark, allowing women like Isha to work in the cooler evening hours.¹³ The city’s flagship adaptation project (Freetown the Treetown) aims to accelerate tree planting to increase the city’s vegetation cover by 50% by 2030. 225,000 trees were planted in 2024 alone, with a survival rate to date of 82%.

However, cool roofs could reinforce the Heat Action Plan and ongoing heat adaptation initiatives to alleviate suffering immediately. 30% of Freetown’s population lives in informal dwellings.¹⁴ These dwellings trap heat indoors, due to construction materials like corrugated iron and tin, with indoor temperatures as high as 40°C recorded.¹⁵ Using cool roof materials is a proven, low-cost opportunity to decrease indoor temperatures. The nonprofit MEER has implemented a cool roofs pilot project in the informal settlement Kroo Bay, finding that buildings painted white are an average of 3°C cooler indoors, while reflective

¹⁰ Ibid.

¹¹ [Atlantic Council Climate Resilience Center](#)

¹² Climate Resilience for All (this report’s author) supported these efforts.

¹³ [Climate Resilience for All](#)

¹⁴ [BBC, 2023](#)

¹⁵ [HERA](#)

materials can provide up to 5-7°C of indoor cooling.¹⁶ Expanding cool roof programs could alleviate the impacts of extreme heat on Freetown’s most vulnerable groups, including women. This analysis suggests that every dollar spent on cool roofs generates over \$13 dollars in economic and health benefits.

Freetown demonstrates how extreme heat disrupts cities not only through health impacts, but through its effects on the food systems and markets that sustain daily life. Isha’s experience shows how outdoor heat exposure, food spoilage, and income loss reinforce one another, eroding health and livelihoods for women who dominate informal trade. Yet the city’s leadership on heat resilience shows that these impacts are not inevitable. By strengthening markets and expanding urban greening and cool roofs, Freetown can reduce the burden of extreme heat on women while safeguarding long-term inclusive development.



¹⁶ [MEER, Baiman et al. \(2024\)](#)



We build resilience to extreme heat

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