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National Hawker Federation, Delhi

HEAT HAVOC

Investigating The Impact On Street Vendors

This study would not have been possible without the survey team who collected responses during the hot summers of Delhi.

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1. Key Highlights

68.92% street vendors have heard about 'heat waves'

9.56% street vendors have heard about Delhi's Heat Action Plan

The street vendors are aware of the heatwave but they lack the systemic support to work or engage with government stakeholders to mitigate its impact.

Health Issues Among Street Vendors During Heatwave

Irritability	Headache	Dehydration	Sunburn	Fatigue	Muscle Cramps
73.44%	**66.93%**	**67.46%**	**66.53%**	**60.82%**	**57.37%**

INSIGHTS FROM FOCUS GROUP DISCUSSION

7 out of 8 women
street vendors reported experiencing high blood pressure

Increased Heat → Sleeplessness → Exhaustion

women in the middle age group raised concerns about delays in their menstrual cycles due to the extreme heat.

Concern Level Among Street Vendors About Health Risk

38.78% extreme concern

8.23% no concern

The probable reasons for the 'not at all concerned' are street vendors who think more about their household's economic and livelihood security than their own health risks.

71.05%
struggle to get emergency medical care due to financial constraints.

80.08% street vendors observe a decline in customer numbers during heatwaves

49.27% of street vendors have been experiencing loss of income due to extreme climatic conditions.

50.86% **of the respondents face the burden of increased financial expenditure or strain due to additional household expenses**

₹4896.52 **average additional cost during extreme heat months**

82.74% **of street vendors have NO GUIDANCE on how to handle heatwaves**

Need of facilities for street vendors at the marketplace

97.6 % want medical facilities

95.9 % want washrooms

91.5 % want drinking water

Average daily work hours of street vendors **11.84 hours**

63.88% **street vendors don't take any 'working breaks' during heat waves.**

2. Introduction

The pre-monsoon heat waves are considered “silent and slow disasters,” which adversely affect people's lives, livelihoods and efficiency. Particularly in urban spaces, people who work as informal labourers, such as street vendors and construction labourers, face considerable difficulty during heatwaves and extreme temperatures. Therefore, it is urgently essential to track the innumerable impacts of rising temperatures on different types of street vendors in an urban environment. Also, between 1992 and 2015, heatwave and extreme temperature events caused 24,223 deaths across the country. The city of Delhi, known as one of India's hottest cities, is particularly susceptible to the impacts of heatwaves due to its large population and a substantial number of lower-income groups. The city experiences intense heat, with very high temperatures, during the summer months, particularly from April to July.

Many people from rural areas gravitate to the city of Delhi due to both the opportunity it offers and the existing distress in their rural counterparts. The distress-driven rural population starts a different vendor type and sells daily household commodities based on their skills and capability. A street vendor is defined as someone who offers goods for sale without a permanent built-up structure, still, with a temporary static structure, mobile stall, or head load (Protection of Livelihood and Regulation of Street Vending Act, 2014). The street vendors community has been experiencing the highest casualties due to heat waves in urban places. Street vendors often live in informal settlement areas, whose low existence of natural vegetation, poor quality of housing, and less access to electricity, and security make them more vulnerable.

They are compelled to work outdoors out of economic necessity to earn their livelihood. Being unable to avoid the outdoors, they are particularly vulnerable to the dangers of heat-wave conditions[3]. Despite the death and rising risk due to heat waves, there has been a lack of focus on mitigating the heat risk for urban street vendors from urban governing bodies. Surprisingly, in India heatwaves are not considered as notified disasters at the national level; heatwaves are still considered as local-level disasters with the jurisdiction of State Disasters Management Authority (Greenpeace India, 2023). However, the existing literature shows that the impacts of heat waves among urban street vendors typically involve dehydration, heat cramps, heat exhaustion, or heat stroke. The signs and symptoms are following (a) heat cramp, which includes swelling and fainting generally accompanied by fever below 39°C; (b) heat exhaustion, which includes fatigue, weakness, dizziness, headache, nausea, vomiting, muscle cramps and sweating; and finally (c) heat stroke, which is a potentially fatal condition, including body temperatures of 40°C, or more along with delirium, seizures or coma (Kotharkar et al., n.d.). As the pace of urbanisation increases across India, it is only likely that a greater number of street traders will contest for urban space and millions of street vendors in a fast-urbanizing India will continue to face this struggle, which seems to have only intensified in recent decades.

3. Objective

Recently launched PM Street Vendor's Atma Nirbhar Nidhi and the Delhi Heat Action Plan (HAP) overlook crucial aspects, such as assessing institutional safety mechanisms in the context of extreme climate conditions for the street vendor community in Delhi. It fails to prioritize evaluating the risks associated with extreme temperatures and heat waves. Therefore, the present study will explore the following research questions-

1. **What is the nature of the lived experiences of street vendors during heatwaves in Delhi? How has the heat risk impacted the work environment, health risk, work productivity and financial capability?**

2. **Are the existing governmental and institutional supports addressing extreme heat risk experienced by the street vendors in Delhi? How has the level of street vendors adapted to heat risk on an everyday basis in the city of Delhi?**

4. Methodology

The heat risk is determined by a combination of meteorological (temperature, relative humidity, wind, direct sunshine), socio-economic (clothing, occupation, accommodation), and physiological (health, fitness, age, level of acclimatization) factors. Therefore, it is more of a methodological concern to determine heat risk. The researcher has used various index-based methods to quantify heat-related morbidity and mortality risk. In general, heat-related risks, morbidity, and mortality during heat waves are the subject of debate and require more advancement in scientific rigour. Medical scholars are uncertain about heatstroke and non-heatstroke death in the context of heat waves in the summer seasons (Klinenberg, 2003). Identifying the causes of heat-health-related death is difficult. The Integrated Disease Surveillance Programme (IDSP) of the National Centre for Disease Control has developed a Transparency framework for heat-related death reporting, which will bring authentication in heat-related mortality. In India, under-reporting of heatwave-related mortality is a normal issue, and reporting dynamics is part of local politics (Rehman, 2023). Therefore, the present study's simple descriptive methodology becomes important to explore the risk of the street vendors community.

In this study, a structured questionnaire was used to collect data on individual street vendors, covering demographics, work environment challenges, coping mechanisms, government support, health, financial, and productivity impacts. Further, the study is focused on collecting empirical data related to bio-meteorology from street vendors to justify the research objectives. We have used mobile GPS, digital hygrometer, oximeter, infrared thermometer, and thermal imaging camera for collecting ambient temperature and humidity, pulse rate, and body temperature, and capturing the thermal image of the environment, which has helped us calculate street vendors' place-wise heat stress.

Image Credit: Greenpeace Volunteers

Image Credit: Greenpeace Volunteers

Thermal Imaging camera is a widely applicable technique to identify hotspots at the micro-climate level, such as variations within streets and houses or local landscapes. It also helps us map the temperature variations across urban landscapes, identifying areas with higher temperatures due to regional land use and covering variations.

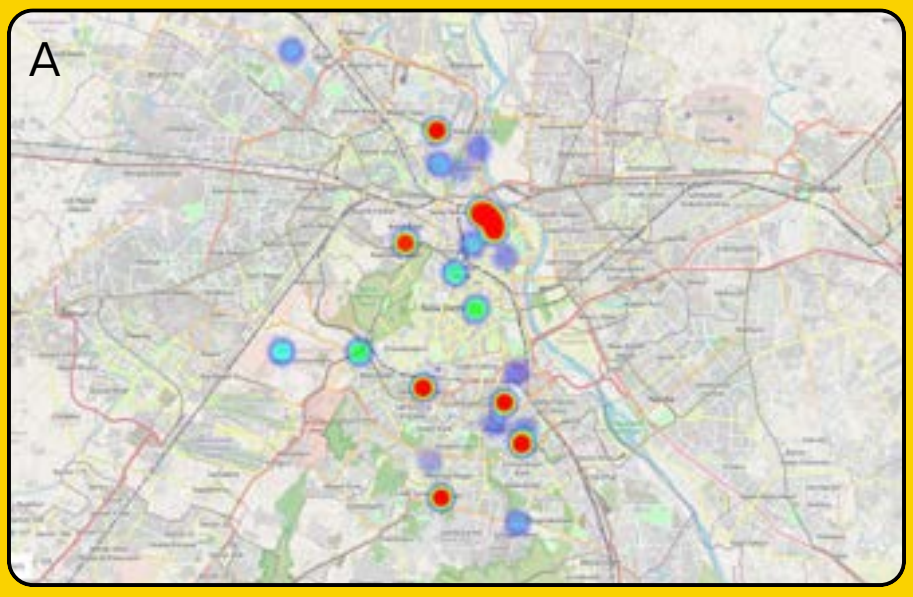
Moreover, we conducted Focus Group Discussion (FGD) among women street vendors in the Sundar Nagri area of Delhi. Sundar Nagri has a high concentration of women street vendors, these women work and stay in the same locality, making it an ideal location for conducting the FGD. A total of eight women street vendors have participated and critically raised the nuanced impact of rising temperatures on their lives and livelihoods, uncovering a tapestry of health issues, economic strains, and adaptive strategies.

Henceforth, large-scale, evidence-based empirical research using the methodology mentioned above to identify approximately risk-prone street vendors in Delhi would have enormous policy benefits. Although the applied methodology is not limitation-free, it is primarily based on vendors' responses, and there is a chance of subjective inclusion in the responses. Moreover, due to time and resource constraints, we have covered only prominent street vendor markets.

4.1 Sampling Size and Technique

For the collection of the responding data, cluster random sampling was used, and a total of 721 street vendors were surveyed with a structured questionnaire. A cluster of major street vendors has been identified based on secondary data and information provided by the National Hawker Federation, along with expert discussion and consultation. The 'random walk' methodology was used for data collection from each cluster. Table 1 shows the top fifteen major clusters and the total number of collected responses. The survey was conducted from the first week of April to the first week of May 2024. Figure 1: Map showing the major clusters and locations of street vendors.

Figure 1:



A. Map showing street vendors' major clusters and locations. The red and blue colour shed shows the high to the low number of responses collected.

B. Geo-location of respondents' street vendor in Old Delhi Chandni Chowk area

Table 1: Top 15 Marketplaces and Spatial Clusters of Street Vendors in Delhi

Name of the marketplaces/ Spatial Cluster of Street Vendors	% share of responses to total sample size
Meena Bazaar	7.17
SP Mukherjee, Old Delhi Railway Station	3.98
Link Road, Opposite Red Fort	3.59
Nehru Place	3.19
Mal Road, Guru Tegh Bahadur Nagar	2.79
Ajmal Khan Road, Koral Bagh	2.66
India Gate and Janpath	2.66
Ghanta Ghar Corner Chandni Chowk	2.52
Samaypur Badli Metro	2.52
Sadar Bazar Road, Delhi cantonment	2.52
PVR Anupam, Saket	2.26
Sarojini Market	2.26
Sangam Vihar Hamdard Nagar	2.26
Thakadar Surajeet Shigh Marg,	2.26
Malviya Nagar	2.26

5. The Study Area: Delhi – A Near Unsustainable Human Habitation

Somvanshi and Kaur (2023) have found that the pattern of maximum temperature in Delhi is changing; for example, the daily mean ambient temperature in the summertime has been relatively stable since 2011, but the city is getting more humid. However, the present decade is much hotter than the last five decades. The unseasonal rains primarily influenced this in recent times. The impact of this increasing humidity on human thermal comfort can be easily correlated. Somvanshi and Kaur (2023) also show that the number of days with high ambient temperatures is stable, but days with dangerously high heat index are rising. In northern India, the average number of days with extreme heat stress conditions during the pre-monsoon summer season will be around 30 days, which means Delhi, a North Indian city, experiences more heat stress days during pre-monsoon seasons (Murari et al., 2015). The number of heat wave days has increased from 49 days in 2018 to 90 days in 2019, and in April, May, and June, the heat wave increased by 35% in the mentioned time Somvanshi and Kaur (2023). It has also been found that a higher number of heat islands are forming during nighttime in Delhi, which indicates that night is becoming more stress-prone compared to past years Somvanshi and Kaur (2023). Table 2 shows the monthly average and deviation of the temperature of Delhi, which indicate a shifting trend of stable temperature conditions between 1981 and 2023. The maximum temperatures peak in May and June, with records going as high as 44.2°C and 43.1°C respectively.

Considering the rising heat trend in Delhi, the Government of the National Capital Territory of Delhi (NCT, Delhi) has publicly released its draft Heatwave Action Plan (HAP) 2023 to build heat resilience and adaptive capacity.

Implementing the mentioned strategies in the plan is yet to begin due to bureaucratic delay, as the plan received higher criticism from experts due to its shallow strategies and scientific rigour (Agarwal, 2024). Further, in terms of housing and economic conditions, a significant part of the city of Delhi is becoming a nearly unsustainable human habitat. The average size of a household in the city was found to be 5.02 units per sq. mt., and about one-third of Delhi lives in sub-standard housing. The city has 6343 slums, with approximately 10.20 lakh households facing seasonal livelihood crises and lacking basic cooling facilities (Directorate of Economic and Statistics, 2015).

Table: 2 Mean Monthly Maximum and Maximum Temperature of New Delhi (Palam)-1981-2023

	Mean Monthly Maximum Temperature (°C)			Mean Monthly Minimum Temperature (°C)		
Month	Average	Standard Deviation	Highest Mean Monthly Maximum Temperature	Average	Standard Deviation	Highest Mean Monthly Minimum Temperature
January	20.3 °C	10.8 °C	23.0 °C in 1990	7.3 °C	3.9 °C	9.1 °C in 1994
February	23.3 °C	18.1 °C	29.6 °C in 2006	10.0 °C	7.6 °C	13.3 °C in 2006
March	29.0 °C	22.4 °C	33.7 °C in 2004	14.7 °C	10.5 °C	17.3 °C in 2005
April	37.0 °C	26.8 °C	39.6 °C in 1999	21.4 °C	14.1 °C	23.3 °C in 2004
May	39.2 °C	29.7 °C	44.2 °C in 1984	25.3 °C	16.9 °C	28.5 °C in 1988
June	39.9 °C	31.6 °C	43.1 °C in 2014	27.8 °C	19.2 °C	29.3 °C in 1995
July	35.9 °C	32.3 °C	40.5 °C in 2002	27.1 °C	20.5 °C	30.7 °C in 2002
August	34.5 °C	32.6 °C	37.9 °C in 1987	26.2 °C	21.3 °C	27.5 °C in 1987
September	33.6 °C	32.7 °C	37.8 °C in 1987	24.0 °C	21.6 °C	26.2 °C in 1998
October	33.4 °C	32.7 °C	35.4 °C in 1987	19.7 °C	21.4 °C	21.7 °C in 1998
November	28.5 °C	32.4 °C	30.3 °C in 1987	13.7 °C	20.8 °C	15.6 °C in 2011
December	22.8 °C	31.7 °C	24.7 °C in 2002	8.8 °C	20.1 °C	10.8 °C in 1985

Source: IMD, 2024.

6. Result and Discussions

An intense, engaging conversation on extreme temperature and heatwave-related stress and risks has been going on among Delhi's environmental policy researchers because the India Meteorological Department (IMD) published and predicted that the maximum temperature would most likely cross the average level (Rajeevan et al., 2023). The present research findings would add enormous value to this engaging discussion. Masuda (2024) has found over a billion outdoor workers in the tropics face extreme heat and humidity half of the year, exceeding safety thresholds for heavy labour, with an additional 1°C of warming, around 800 million people will live in areas where heavy work should be limited for over half the year.

6.1

Street Vendors in a Scouring Tropical City

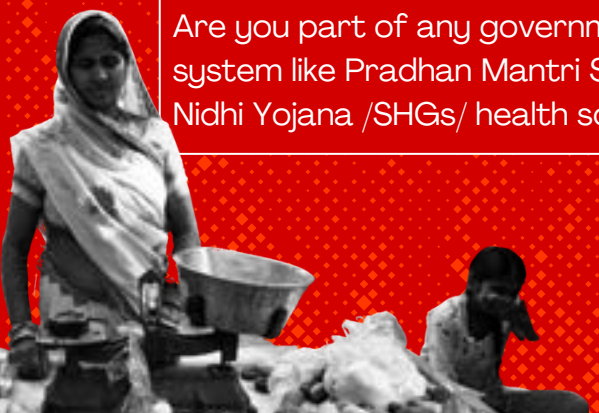
The survey data shows that the average age of street vendors in Delhi is 45.3 years, whereas the median age of the street vendor is 36 years, indicating that most street vendors in Delhi are in their mid-age. However, table 3 shows a descriptive glimpse of street vendors in Delhi. A significant portion (68.92%) of street vendors have heard of the 'heat waves' concept, locally known as Loo and Andhi. In contrast, only a small fraction (9.56%) of street vendors know about the Delhi Heat Action Plan (HAP). This indicates that street vendors are aware of the heatwave but lack the systemic support to work or engage with government stakeholders to mitigate its impact. It has also been found that street vendors of Delhi have worked as street vendors for an average of 16.2 years, and still, a large number of vendors were not consulted during the preparation of HAP. As Pillai and Dalal (2023) rightly mentioned, 'Most HAPs are not built for local context and have an oversimplified view of the hazard'.

The survey results on the caste distribution of street vendors reveal significant insights into the socio-economic dynamics at play. A notable majority of street vendors, accounting for 63.2%, opted not to disclose their caste. Among those who did disclose their caste, the General category leads with 14.0%, followed by the Other Backward Classes (OBC) closely at 13.5%. The Scheduled Castes (SC) category, representing 6.5% of the vendors, underscores the involvement of historically marginalized groups in street vending, a sector often characterized by economic informality and vulnerability. The Scheduled Tribe (ST), with only 0.1%, shows a minimal representation. Moreover, the caste composition of street vendors points to the complex socio-cultural factors influencing their occupational choices and the pervasive issue of caste-related reticence.

Table: 3 Street vendors' basic perception of Heatwave and Extreme Temperature in Delhi

Indicators	**Yes** (%)	**No** (%)
Have you heard about "heat wave or Loo" in the recent past?	68.92	27.49
Are you aware about "Delhi Heatwave Actions Plan -2023?	9.56	86.99
Have you taken any measures to prepare better for extreme heat events to work efficiently?	43.03	52.72
Do you think less number of customers visit your stalls during heat waves compared to the non-heat wave period?	80.08	6.11 (9.3% mentioned no difference)
Do you take any 'working breaks' during heat waves?	63.88	31.34
Have you ever received any advice or guidance about what to do in a heatwave?	17.26	78.35
Do you think that you need a medically equipped heat shelter in near your market area/ street/ neighbourhood?	85.39	9.83
Are you part of any government financial support system like Pradhan Mantri Street Vendors' Atmanirbhar Nidhi Yojana /SHGs/ health schemes, etc., ?	14.21	81.54

Source: Primary Survey, 2024.



Street vendors in Delhi sell a variety of products and meet the people's demands at low prices. From selling refreshments products to electronic gadgets, they sell almost all household necessities. Figure 2 shows the distribution pattern of commodities/products sold by street vendors in Delhi. It shows 22.7% of street vendors selling food items, mainly fast foods like Samosa, Pakora/Bhaji, Kachori, Chowmein, Momos, Chole Bhature, Kulfi, followed by garments (21.9%), accessories (14.4%), and refreshments (mainly tea and Pani Puri/Golgappa, Lassi, and ice cream) (12.3%). Apart from these mentioned categories, street vendors in Delhi sell cosmetics, jewellery, medicine, footwear, sanitary items, fresh vegetables and dry foods.

The survey observation also shows that heatwave conditions increase the quicker loss of fresh food items, such as fresh vegetables and other items, affecting the street vendors' daily income. Therefore, many vendors repeatedly mentioned the loss of income, which will be discussed later in this report.

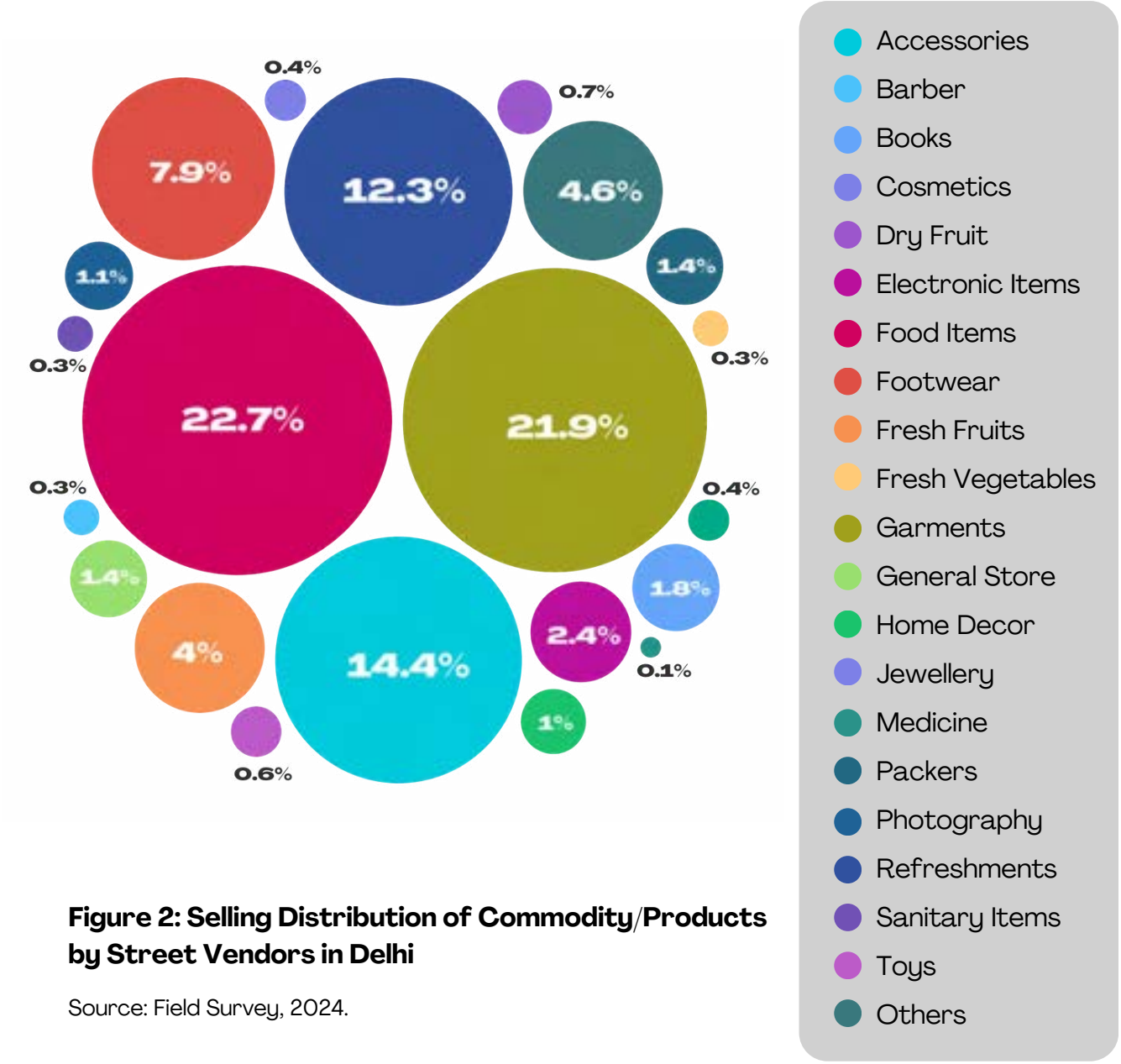


Figure 2: Selling Distribution of Commodity/Products by Street Vendors in Delhi

Source: Field Survey, 2024.

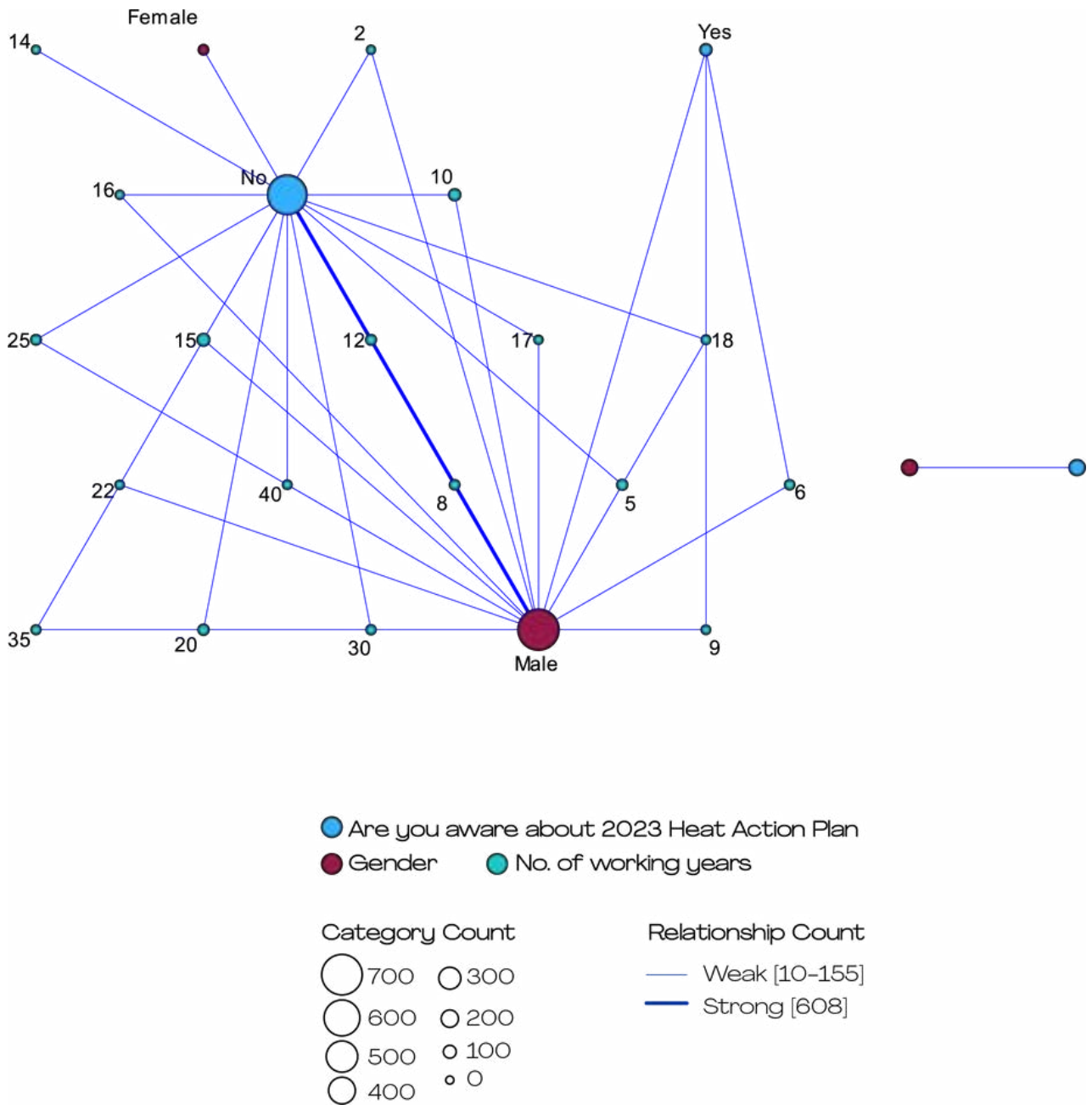


Figure 3: Relationship Map of Gender-wise Working Years and Awareness of the 2023 Heat Action Plan Among Street Vendors in Delhi

Source: Field Survey, 2024.

Furthermore, figure 3 visualizes the interrelationship of the number of years street vendors have been working and their awareness of the Delhi HAP-2023, intersected by gender. The relationship map shows a weak correlation between the number of years and awareness about HAP-2023, which indicates an oddity in the consultation process during the preparation of HAP-2023. Very few people have been aware of HAP-2023, and not a single female vendor is aware of HAP-2023.

6.2

Heatwave-Induced Health Risk among Street Vendors in Delhi

High incidences of irritability, anxiety, and sleeplessness among vendors have been observed during heatwaves. Table: 4 shows the prevalence of health issues due to heatwaves and extreme temperatures during the survey period, which reveals that a significant majority of respondents experienced health issues due to hot weather. Irritability was the most common, affecting 73.44% of respondents, followed by headaches (66.93%), dehydration (67.46%), sunburn (66.53%), fatigue (60.82%), and muscle cramps (57.37%). These findings highlight the widespread impact of extreme temperatures on public health, emphasizing the need for effective measures to address these concerns. The extreme temperature and heatwave exacerbate existing health conditions such as asthma and diabetes. Whereas, as some street vendors pointed out, their Asthma condition is worsening due to heat, and they experience a higher level of discomfort, particularly during the day.

Table: 4 Prevalence of Health Issues Due to Heat Waves and Extreme Temperature during Survey Period, 2024

Health Issues	Irritability	Headaches	Sunburn or Sun Tanning	Muscle Cramps	Fatigue or heat exhaustion	Dehydration
Yes (% share)	73.44	66.93	66.53	57.37	60.82	67.46
No (% share)	26.56	33.07	33.47	42.63	39.18	32.54

Source: Field Survey, 2024.

Guddi ji's work experience gives her a new challenge every day. After 12 noon, the sun starts showing its fury, and the heat slowly penetrates inside the Kolhu (crusher machine). It seems as if the shade is ignored, and only the bright sunlight spreads all around. Afternoon is a very difficult time; when the body gives up, pouring two mugs of cold water over oneself becomes very necessary. The suit starts sticking to the body, causing itching. The heat in the body increases so much that it feels like a fever is coming on. Sometimes one has to take pills to counter the heat because one has to stay at the Kolhu until 11 pm.

I don't have enough mass on my body to bear such intense heat, so I go home once a day to splash water on myself. I can stay at home for only 10 minutes before returning to Kolhu. In the beginning, when I started operating the Kolhu, the lower part of my body became a place of pain from standing all day. My body has undergone two operations, and due to standing, I could not go to the bathroom for 2 hours at a time, which caused a heaviness in my stomach. Still, I stand at the Kolhu to get the work done. The heat increases every day. We are living under the open sky; what resources can I gather? If possible, there should be some trees and plants nearby, so that fresh air keeps blowing and the body gets some relief.

Arre Bhaiya, after being exposed to the heat of the sun all day, I don't feel like eating dinner at night. All I can think about is stretching my legs and going to sleep.

Guddi Ji →

Further, all the women who participated in FGD mentioned that sleeplessness during the night has become quite common due to increased heat, and this results in exhaustion throughout the day. The participants also flagged the issue of children in their families exhibiting symptoms like vomiting, diarrhea, and nosebleeds, further complicating the vendors' challenges. The FGD in Sundar Nagri in Delhi also shows that an alarming 7 out of 8 women reported experiencing high blood pressure. These women emphasized the seriousness of their condition, revealing that they are currently under medical consultation to manage high blood pressure. Notably, women in the middle age group raised concerns about delays in their menstrual cycles due to the extreme heat. The disruption of menstrual patterns poses physical discomfort and adds another layer of complexity to the challenges faced by women street vendors.

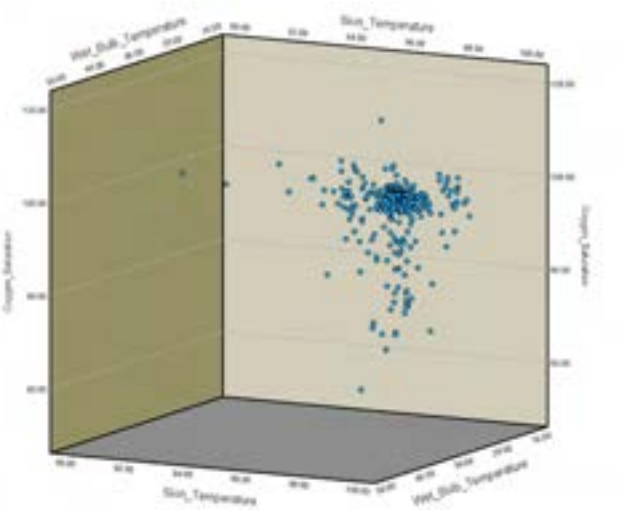


Figure 4: Relationship of Oxygen Saturation with Wet-Blub Temperature and Skin Temperature of Street Vendors in Delhi

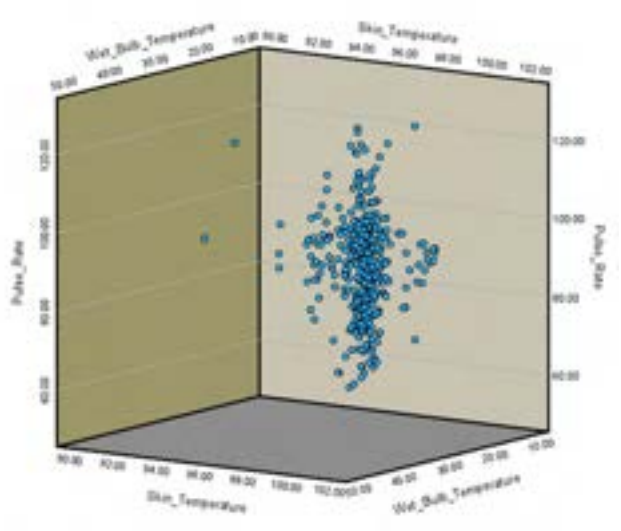


Figure 5: Relationship of Pulse Rate with Wet-Blub Temperature and Skin Temperature of Street Vendors in Delhi

Source: Field Survey, 2024.

Moreover, figures 4 and 5 show the relationship between oxygen saturation (SpO2) in blood and pulse rate (bpm) with wet-bulb temperature and skin temperature of street vendors in Delhi, which indicates that a large number of people on the verge of health risk due to this heatwave condition. Wet-bulb temperature is an indicator of heat stress, combining temperature and humidity, while skin temperature reflects the body's response to environmental conditions, and oxygen saturation (SpO2) in blood and pulse rate (bpm) are two major indicators of a healthy heart. The data points' distribution revealed clusters indicating typical responses and potential outliers, which indicate that higher wet bulb temperatures may jeopardise many street vendors concerning their cardiac function.

Further, figure 6 shows the pattern and level of health risk concerns among street vendors in Delhi, which shows that 38.78% are extremely concerned, whereas only 8.23% show no concern. The probable reasons for the 'not at all concerned' response mentioned by the respondents are due to a large number of street vendors being unaware of the harsh heat conditions and the health risks that come with being exposed to the heat. Also, these street vendors think more about their household's economic and livelihood security than their health risks.

Moreover, it has also been found that a majority (71.05%) have struggled to get medical care due to financial constraints. Regarding the affordability of emergency healthcare in extreme temperature conditions, 19.65% mentioned they could not afford healthcare at all, whereas 26.56% could afford healthcare without compromising other households' necessities (Figure 7).

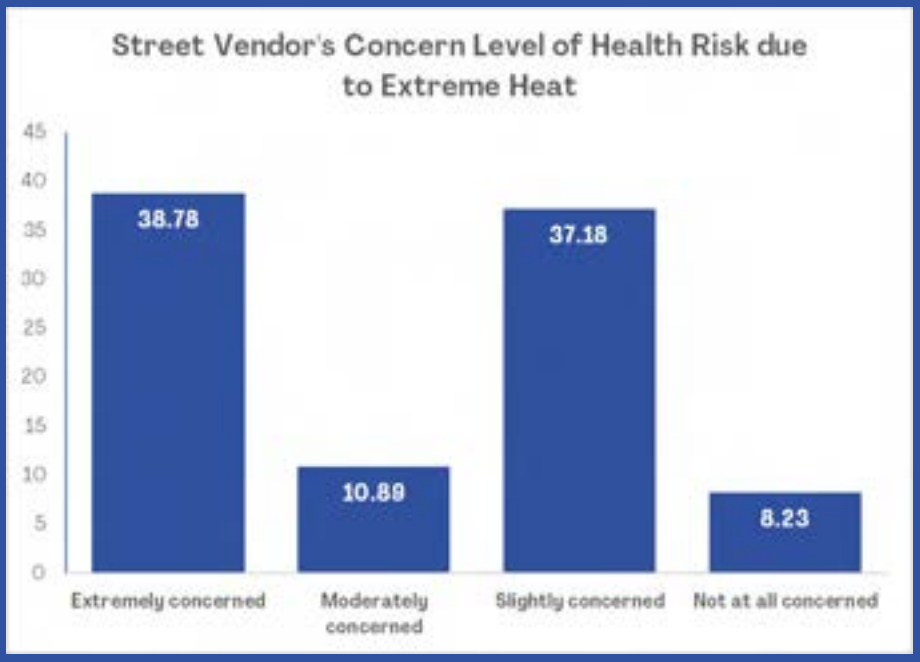
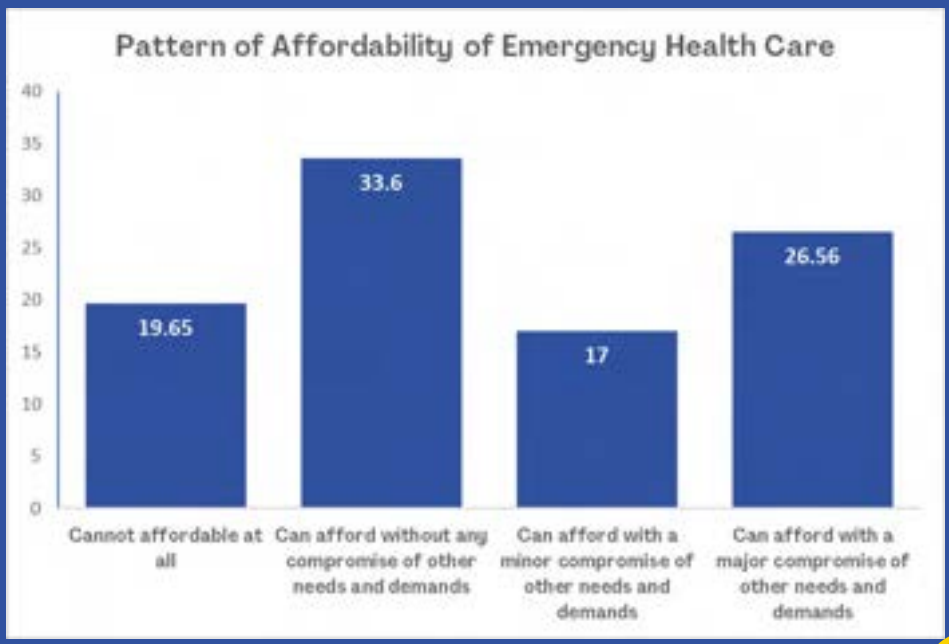


Figure 6: Level of Health Risk Concern among Street Vendors in Delhi

Source: Field Survey, 2024.

Figure 7: Pattern of Emergency Healthcare Affordability among Street Vendors in Delhi

Source: Field Survey, 2024.



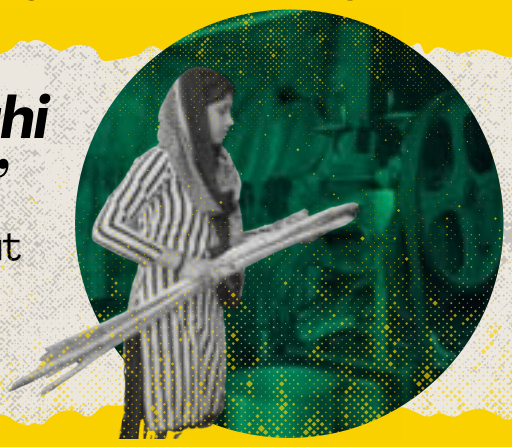
6.3

Heatwave Impact on Livelihoods and Financial Condition of Vendors in Delhi

The survey results show that a major portion of street vendors raised the concern of decreasing customer footfall during heat waves, particularly in the afternoon and in the evening. 80.08% of street vendors observe a decline in customer numbers during heatwaves than the usual days. A women's street vendor in Sundar Nagri engaged in the business of sugarcane juice mentioned that her business has fallen drastically this year compared to previous years. She further says that,

'log ghar se bahar hi nahi nikalte, bikri kaise hogi'

(In the heat, people don't come out of their houses, how will we sell anything?)



One of the vegetable vendors mentioned that they endure substantial losses as their products deteriorate rapidly in the heat, sometimes leading to losses averaging between 500-600 rupees, the vendor rightly mentioned that

'Mai wohi sabziyaan bechti hun, jo saste mai mil jaye, warna bahut nuksaan hota hai'

(I sell only those vegetables that I get at a cheaper rate or else I have to face losses).

Moreover, **50.86% of vendors mentioned that they are facing increased financial expenditure or strain** due to additional household expenses, including children's demands for soft drinks and heightened healthcare costs, adding to their financial burden. It has been found from the survey research that **on average, INR 4896.52 is an additional cost during extreme heat months**. In addition. **49.27% of street vendors have been experiencing loss of income** due to extreme conditions.

Further, **50.8% of participants raised the issue of Increasing expenses for cooling and healthcare, and 49.27% responded to loss of overall daily income**, further squeezing the already tight household budgets. The street vendors also mentioned that mitigation and adaptation to heat events are expensive and additional costs associated with staying cool during extreme heat events; **81.14% of vendors mentioned their electricity bill has increased**, followed by **63.08% responded that they spend extra money to create a vendor canopy**.

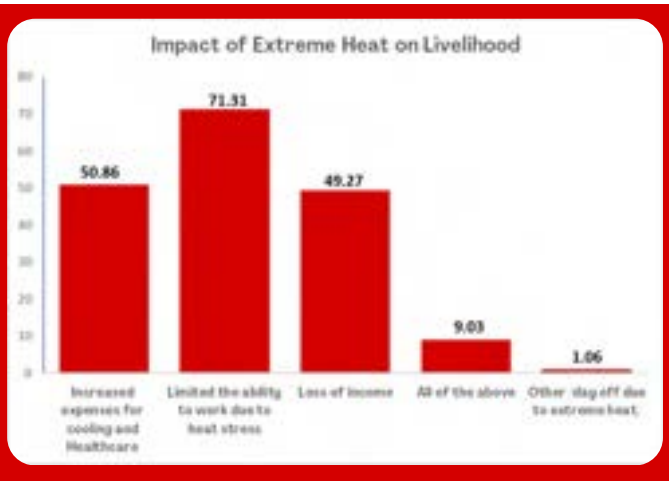


Figure 8: Pattern of Emergency Healthcare Affordability among Street Vendors in Delhi

Source: Field Survey, 2024.

Growing thermal discomfort in Delhi is a significant public health and livelihood concern due to increasing temperature and humidity because, recently, average rainfall in Delhi has been a rising trend. For a robust understanding of the process of livelihood earning and its associated stress, we captured the real-time condition of street vendors using a thermal camera. Figures 9 to 12 show the thermal condition of different street vendors in different parts of Delhi. The thermal images show that street vendors are working up to 50 °C temperature. A large number of street vendors also want financial support from the local governmental bodies to purchase cooling appliances, which becomes more vivid from the following conversation with a women vendor - "Financial assistance or subsidies to help offset the cost of purchasing cooling equipment and supplies, making low-income vendors accessible. It may help them achieving easy and accessible livelihoods " (कम तंख्वाह वाले वेंडर को कूलिंग उपकरण और बाकी चीजों में मदद करने के लिए वित्तीय सहायता या सब्सिडी प्रदान की जानी चाहिए, जिससे उन्हें आसान और सुलभ आजीविका प्राप्त करने में मदद मिल सकती है।) --- Rani (Age, 38).

Delhi's Thermal Discomfort

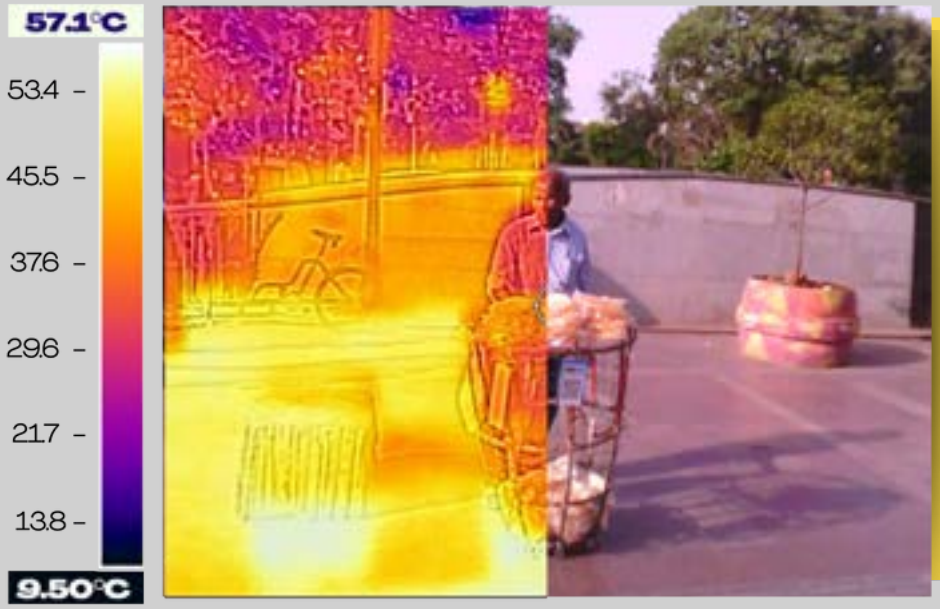


Figure 9: Geolocation: Connaught Place, Date and Time: 5/1/2024 4:35:14 PM, Maximum and Minimum temperature - 54.6 °C and 10.5 °C, respectively.

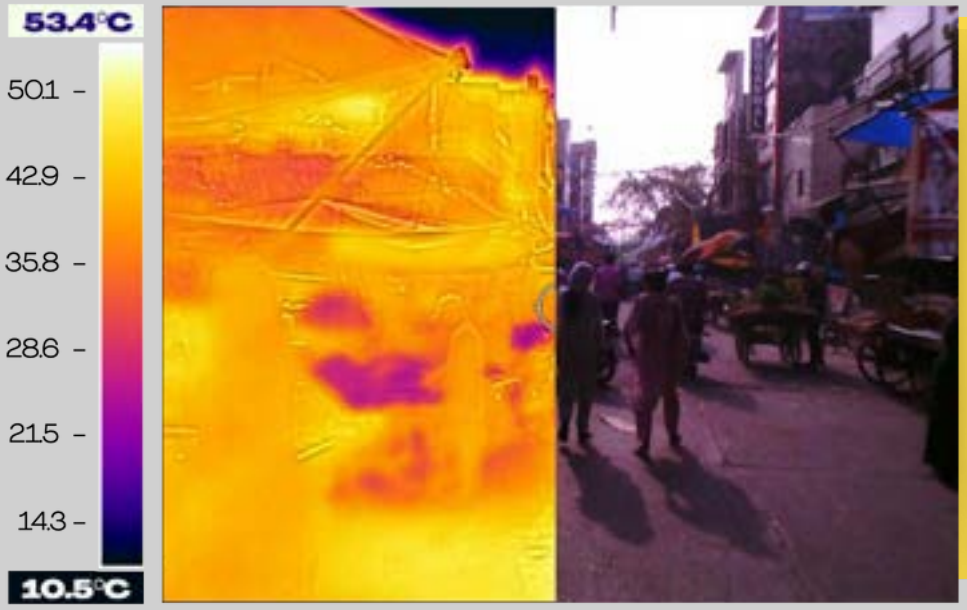


Figure 10: Geolocation- Connaught Place; Date and Time 4/28/2024 4:09:18 PM, Maximum and Minimum temperature - 52.2 °C and 9.6 °C, respectively.

Figure 11: Geolocation- Lajpath Nagar; Date and Time 4/27/2024 1:12:23 PM, Maximum and Minimum temperature - 59.5 °C, 8.5 °C, respectively.

Figure 12: Geolocation- Khan Market; Date and Time 5/1/2024 2:58:52 PM, Maximum and Minimum temperature are 40.9 °C and 20.5 °C, respectively.

6.4

Heatwave Mitigation and Adaptation Measure Practices by Street Vendors in Delhi

Over half of the vendors (52.72%) have not taken measures to prepare for extreme heat, indicating a lack of resources, whereas we have seen that the majority of street vendors are aware of the heatwave. It has also been found that most vendors (82.74%) have not received any guidance on handling heatwaves, underscoring the need for educational or awareness initiatives. We asked the street vendors how often they take a 'work break' during the extreme heat conditions; the results show that 28.9% of street vendors never get a chance to take a break, whereas 47.3% of street vendors responded that they take a break based on work pressure and situations, and 2.7% people rarely take a working break. The survey results also show that, on average, a street vendor in Delhi works 11.84 hours per day, which indicates that taking a working break is necessary during heat waves.

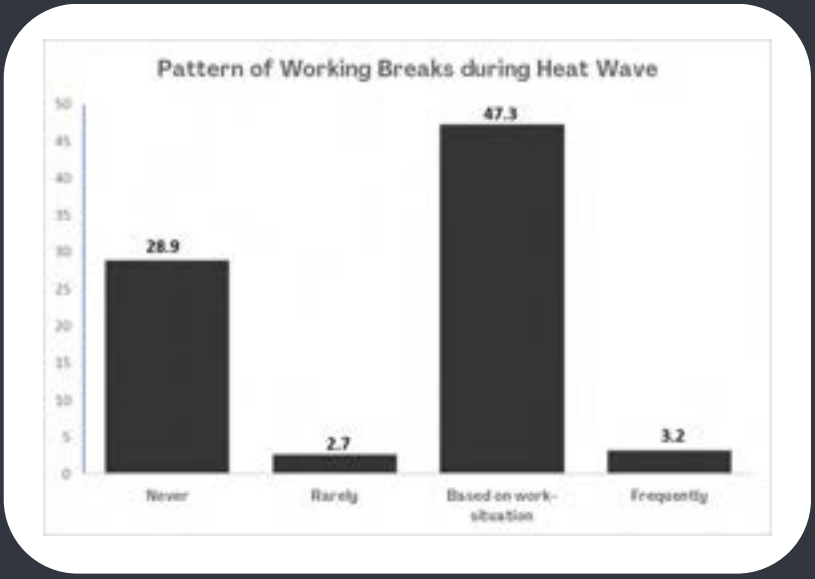


Figure 8: Pattern of Working Break of Street Vendors in Delhi during Heatwaves

Source: Field Survey, 2024.

Moreover, the most common practice adopted by almost all respondents is to take refuge in shaded areas, preferably those with trees, when not attending to customers to escape the oppressive heat. The following are some major adopted techniques by street vendors to reduce the heat impact-

Wet Cloth Method: Some vendors wet their Dupattas and drape them over their heads to alleviate immediate discomfort. Although they acknowledge potential long-term health risks associated with this practice, they mentioned that is the only option they have to keep themselves cool in the scorching heat.

Improvised Shelter: Some vendors have employed makeshift roofing solutions like Chappar or plastic sheets to shield themselves from the sun's intense rays.

Traditional Cooling Methods: Most of the vendors mentioned that they didn't have a fridge in their homes. Hence, in the absence of modern cooling equipment, vendors rely on traditional methods such as storing water in clay pots ('Matki ki Pani') for cooling purposes.

Dietary Adjustments: Dietary changes are made to accommodate the heat, with lighter meals like 'Chawal and Raita' becoming preferred lunch options, offering some respite from the heat. Some also mentioned that for breakfast, they usually have 'Sattu' in water

Limited Clothing Adaptations: Due to constraints on time and resources, women vendors expressed that they make minimal adjustments to their clothing choices, often wearing what is readily available, even if it may not be suitable for the weather conditions.

Sabila Ji →

“

There is no tarpaulin on the cart, so the hot sun falls directly on my head, making my forehead hot. To cope I wet my dupatta and put it on my head. It feels fine for a while, but once the dupatta dries, it starts getting hotter again. This leads to headaches due to the heat. Despite my efforts, I do not get relief from the heat, so I wash my hands and feet with the water from the tank in the toilet. The heat is so intense that the vegetables are rotting. The smell of rotting tomatoes goes straight to my nose, and I constantly feel the smell of rotten tomatoes in my nose. It seems that even when talking, the smell of rotten tomatoes comes out of my mouth.

I am a diabetic patient, so sometimes I have to spend the day sitting due to weakness from the sun. When I do not get a place to rest, the veins in my legs get blocked while pulling the cart. There is a pricking sensation in my knees, and pain starts. The smell of rotting vegetables is entering my body, and sometimes I have trouble breathing. The days to come are getting more difficult. Besides roaming around, if I could find a regular place where I could tie a tarpaulin on my cart to protect myself from the hot sun falling directly on my head, it would be a great relief.

What's hot today?

It's Delhi!

Figure 9: Extreme Temperature Profile of Different Market Places in Delhi

Source: Delhi Times, 2024.

6.5

Street Vendor's Recommendations

The Supreme Court of India has recognised 'security' from extreme climatic events as a basic human right, and the state has to secure its citizens from climate change-induced disasters, such as heat waves and extreme temperatures (Ranjitsinh and Ors. Vs Union of India and Ors, 2024). A large majority (85.39%) feel the need for medically equipped heat shelters, showing a critical need for better infrastructure. Figure 10 shows the type of facilities sought by the street vendors in Delhi, which indicate that 97.6 % of street vendors want medical facilities in the marketplace place, and 95.9% also want washroom facilities. In many places, the street vendors community in Delhi lacks accessibility to localised pure drinking water, which becomes clearer by finding that 91.5% of vendors are seeking drinking water facilities in the marketplaces.

Moreover, one anecdote shared during the FGD exemplifies the spirit of solidarity and care as an adaptation measure. A middle-aged woman recounted an incident where she and fellow vendors in the street rushed a customer to the doctor as he fainted due to extreme heat. This demonstrates their quick thinking and willingness to assist those in need despite their struggles. Furthermore, in Delhi, street vendors provide emergency services, from water to household appliances; for example, street vendors often offer water and insist the customers have a seat in the scorching heat, recognising the importance of kindness and support as community driven adaptation.

Figure 10: Distribution of Facilities Seeking by the Street Vendors in Delhi

Source: Field Survey, 2024.

7. Conclusion: Deep Dive into the Socio-Environmental Life of Streets in Delhi

The observations and findings illuminate how street vendors experience extreme temperature conditions and showcase resilience in the face of rising temperatures and livelihood adversity. They are the ones who are badly impacted by the rising temperatures, whereas they are the least contributor to urban greenhouse gas emissions.

From the perspective of policy framing, we would like to argue that street vendors, often migrating from rural areas as economic refugees, come to cities with the hope of securing basic necessities for their families. Yet, rather than fostering a supportive environment, current government policies are eroding their livelihoods, reducing their incomes, and stifling their entrepreneurial efforts. It is imperative to ask what safety nets are being established for these rural migrants, especially given the increasing temperatures. In Delhi, street vendors frequently face forced displacement and harassment. To address this and promote sustainable economic growth, governments must adopt policies that provide stability and security. This includes offering essential amenities like restrooms. By creating an inclusive and supportive atmosphere, we can enable street vendors to flourish economically, thus contributing positively to the urban economy and improving their quality of life. Securing their safety and stability not only aids the vendors but also enhances the urban environment to which they significantly contribute.

8. RECOMMENDATIONS

- The National Disaster Management Authority (NDMA) should declare heatwaves as a national disaster in India. This recognition will ensure dedicated fund allocation for heatwave adaptation, mitigation and relief efforts, enabling effective preparedness and response mechanisms tailored to protect vulnerable populations like street vendors. The recognition of heatwaves as a national disaster provides an opportunity to advocate for evidence-based policies and interventions that prioritizes heatwave resilience and national and regional development agendas.

- The union government's heatwave and other climate adaptation policies must explicitly recognise street vendors as a highly vulnerable community and should be given special attention and protection. Moreover, the impact of heat is not gender-neutral and disproportionately affects women street vendors and other outdoor workers. Hence, these policies must account for these realities, addressing women's unique challenges to ensure their safety and well-being.

- The street vendors should be integrated into city-wide emergency response plans for heatwaves to ensure they receive timely warnings, information and support during extreme heat events. Additionally, workshops and training sessions should be conducted to educate vendors about heatwave preparedness, including recognizing symptoms of heat stress and taking preventive measures. This can be done by developing and disseminating easy-to-understand guidelines for vendors on what to do during extreme heat events.

- Primary health centres should be equipped to address heat-related risks effectively, with specific attention to women's needs. This includes providing adequate training to healthcare professionals on managing heat-related illness and ensuring the availability of necessary medical supplies and facilities to treat such conditions. Additionally, these centres should offer tailored support for women, considering factors such as pregnancy, menstrual health and childcare responsibilities, to ensure their unique needs are met during extreme heat conditions.

- 'Drinking Water Stations' should be strategically established throughout the markets and street vending areas to ensure street vendors have continuous access to clean and cool drinking water, reducing the risk of dehydration and heat-related illness.

- Clean and well-maintained washroom facilities must be installed in and around street vending areas to ensure that street vendors (especially women) have easy access to sanitation. These facilities should be equipped with adequate water supply, proper ventilation and regular maintenance to ensure hygiene and comfort, especially during extreme heat conditions.

- The central and state governments should provide street vendors with regular rations and electricity to protect them from working in peak heat conditions.

- Community Cooling Centres (CCC) can significantly benefit street vendors and outdoor workers by providing a cool and comfortable space during extreme heat exposure. These centres should be designed to be eco-friendly and inclusive by considering the needs of street vendors and other outdoor workers, ensuring the safety and accessibility of amenities tailored to their requirements.

- The street vendors community, the least emitter of greenhouse gasses in an urban setting, are highly affected by the urban heat island effect. Therefore, we recommend creating a dedicated loss and damage fund by the government to compensate outdoor vendors for work loss due to heatwaves and out-of-pocket expenses such as health, cooling, etc. This fund should comprehensively address the financial and non-financial burdens that heatwaves impose on them. Moreover, it is crucial for the government to incorporate the perspectives of other outdoor and informal workers in developing this loss and damage fund. Their insights and experiences are essential for creating an effective and equitable compensation mechanism that meets their needs.

- The government should adequately fund, consolidate and strengthen climate attribution science- both event and source attribution- with respect to heatwaves. This is crucial for designing and improving climate actions.

- Given the intertwined challenges of fossil fuel emissions and the urban heat island effect, which disproportionately impacts marginalized groups like street vendors and other outdoor workers who contribute minimally to these issues, we recommend a policy framework based on the polluter pays principle. This involves a phase out of fossil fuels, with major polluters funding adaptation related measures, renewable energy infrastructure, energy efficiency measures, and green building practices. Additionally, these polluters should finance the expansion of public transportation and the creation of urban green spaces. By ensuring that those responsible for the majority of emissions bear the costs of mitigation, we can promote a more equitable and sustainable urban environment.

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National Hawker Federation, Delhi

National Hawker Federation (NHF) Delhi Unit has been a steadfast advocate for the rights of street vendors' rights, reclaiming markets and securing livelihoods for over 5,000 families. Beyond this, they tackle social issues like climate change, plastic pollution, tax justice and inequality, aiming for a fairer society.

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