Centre for Sustainability and Corporate Governance Research

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WEBINAR SUMMARY REPORT

Too Hot to Work and Too Poor to Rest: The Health and Economic Costs of Heat Stress for Informal Workers in South Asia

September 16, 2026





by



Ms. Ritu Bharadwaj
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In conversation with
Prof. Namrata Chindarkar and Prof. Anish Sugathan
Faculty, IIMA

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Research Webinar

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Table of Contents

About the Speaker 01
About the Moderator 02
Abstract 03
Introduction 04
Seminar Summary 05
Q&A and Panel Discussion 10
Key Takeaways & Conclusion 14
Acknowledgements 15
References 16

About the Speaker



Ms. Ritu Bharadwaj

Ms. Ritu Bharadwaj is Director of Climate Resilience, Finance and Loss & Damage at the International Institute for Environment and Development (IIED), where she leads the ALL ACT initiative on locally led loss and damage action. Her work covers climate finance, loss and damage, social protection, migration, and resilience in least developed countries and small island states, and she developed the Comprehensive Climate Impact Quantification (C-CIQ) methodology for quantifying the economic and non-economic costs of climate impacts. She is a Lead Author for the IPCC Sixth Assessment Report (AR6) Working Group II chapter on responses to losses and damages.

About the Moderators



Prof. Namrata Chindarkar

Prof. Namrata Chindarkar is a faculty member at the JSW School of Public Policy (JSW-SPP), Indian Institute of Management Ahmedabad, and serves as Chairperson of the Faculty Development Programme (FDP) at IIMA. She is a Fellow of the Initiative for Sustainable Energy Policy (ISEP) at the Johns Hopkins School of Advanced International Studies. Previously, she was an Assistant Professor at the Lee Kuan Yew School of Public Policy, National University of Singapore (NUS), and a faculty associate at the Institute of Water Policy, NUS. She holds a PhD in Policy Studies from the University of Maryland – College Park, an MPhil in Social Sciences from the Tata Institute of Social Sciences, and a Master's in Development Studies from the University of Manchester. Her research addresses questions at the intersection of sustainable development and social policy, with three key themes: access to basic infrastructure (energy, water and sanitation); individual and household welfare (poverty, inequality and subjective wellbeing); and gender and development. Her methodological approach draws on quantitative analysis and policy impact evaluation using primary, secondary and administrative data.



Prof. Anish Sugathan

Prof. Anish Sugathan is a faculty member in the Strategy Area and the Chairperson of the Centre for Sustainability and Corporate Governance Research (CSCG) at the Indian Institute of Management, Ahmedabad. He pursued his PhD (FPM) from the Indian Institute of Management Bangalore (IIMB), a post-doctoral fellowship from the Harvard Kennedy School of Government, and is a visiting research fellow of the 2022 'Sustainable Futures' programme at Princeton University. He serves as a member of the expert committee appointed by the Honourable National Green Tribunal of India for environmental impact assessment and evaluation. He is also a member of the Sectional Committee for Sustainable Finance of the Bureau of Indian Standards. He has served on the board of the state-owned electricity distribution utility UGVCL, Government of Gujarat, as an independent director. He advises several start-ups in the energy tech, impact investment and innovative governance sectors. Prof. Sugathan's research interests focus on the institutional and governance infrastructure of emerging economies, with a particular emphasis on sustainable development and corporate sustainability in India. His research has been published in reputable international journals as well as numerous national and international newspapers. His research has received several prestigious awards, including the SAP Labs India doctoral scholarship at IIMB, the Giorgio Ruffolo post-doctoral research fellowship at Harvard, and the Fung Global Fellowship at Princeton. His current research work is supported by BP UK through the PROSPER programme, Evidence in Governance and Politics (EGAP) at the University of California, Berkeley, and Google through the Geo-for-Good research grant.

Abstract

This report presents the key insights from a webinar by Ms. Ritu Bharadwaj, Director of Climate Resilience, Finance and Loss and Damage at the International Institute for Environment and Development (IIED), titled "Too Hot to Work, Too Poor to Rest", focusing on the health and economic costs of heat stress for informal workers in South Asia. The webinar was jointly organised by the Centre for Sustainability and Corporate Governance Research (CSCG) and the IIMA-PwC ESG Forum at IIM Ahmedabad.

Drawing on two recent IIED reports on India and Bangladesh, the webinar examined heat stress as a slow-onset form of climate-related loss and damage whose impacts are often not quantified in the same way as those of floods or cyclones. The underlying study drew on a survey of around 700 households from two countries: Delhi, Ajmer and Agra in India, and Dhaka in Bangladesh. It used IIED's Comprehensive Climate Impact Quantification (C-CIQ) toolkit and its framework of predisposing, precipitating, and protective factors. The study covered both indoor and outdoor workers, heat exposure at home as well as at the workplace, and both economic and non-economic losses.

The findings described poor housing and sanitation conditions, low uptake of existing social protection entitlements, high rates of heat-related illness symptoms with low rates of treatment-seeking, and a significant risk of kidney injury and chronic kidney disease. The study estimated that heat-related losses amount to around 1.99 per cent of GDP in India and around 1.3 to 1.4 per cent in Bangladesh. As a way to reduce both the economic losses and the health damage that workers suffer, Ms. Bharadwaj recommended heat-triggered cash transfers equivalent to paid wages on extreme heat days, with insurance used only as a top-up in record heat years. She also proposed better access to existing health and food entitlements, and changes to India's new occupational safety and health code. The question-and-answer session addressed the balance between mitigation and support for households, the study's methodology, the design of insurance, integration with existing programmes, gendered impacts and protections for MSMEs.

Introduction

Extreme heat is a serious and growing occupational hazard worldwide. According to the International Labour Organization (ILO), at least 2.41 billion workers, or 71 per cent of the working population, are exposed to excessive heat. In 2020, this exposure was linked to 22.85 million non-fatal injuries and 18,970 deaths. South Asia is among the regions most affected. The ILO projects that, under a 1.5°C global warming scenario, South Asia will lose 5.3 per cent of its working hours in 2030 to heat stress, equivalent to around 43 million full-time jobs. In India, the Lancet Countdown estimates that heat exposure in 2024 caused the loss of 247 billion potential labour hours, with agriculture accounting for 66 per cent and construction for 20 per cent of these losses. The associated potential loss of income from reduced labour capacity was US$194 billion.

These pressures fall on a workforce that is largely informal, since nearly 90 per cent of workers in India are informally employed. The ILO notes that workers are among those most exposed to temperature extremes, yet frequently have no choice but to continue working despite the risks. It identifies migrant and informal workers, indoor workers in unventilated environments, and those doing physically demanding outdoor work as being at higher risk. The health effects also extend beyond the immediate illness. Recurrent heat exposure combined with physical exertion and inadequate hydration can lead to chronic kidney disease that is distinct from kidney disease caused by diabetes, hypertension or glomerulonephritis. In 2020, around 26.2 million people worldwide were living with chronic kidney disease attributable to heat stress at work.

Heat stress also poses particular challenges for the assessment of loss and damage. Under the United Nations Framework Convention on Climate Change (UNFCCC), increasing temperature is classed as a slow onset event, alongside processes such as desertification, sea level rise and salinisation. The UNFCCC also recognises non-economic losses, which are losses that are not easily quantifiable in economic terms, such as loss of life and degraded health.

It was against this background that the Centre for Sustainability and Corporate Governance Research (CSCG) and the IIMA-PwC ESG Forum at IIM Ahmedabad hosted a webinar by Ms. Ritu Bharadwaj of the International Institute for Environment and Development (IIED). The webinar examined the health and economic costs of heat stress for informal workers in South Asia.

Seminar Summary

Framing: Heat Stress as a Slow-Onset Form of Loss and Damage

Ms. Ritu Bharadwaj opened the session by explaining that the research set out to quantify both the economic and non-economic loss and damage caused by heat stress among informal workers. She began by distinguishing between rapid-onset and slow-onset climate events. Rapid-onset events such as floods and cyclones arrive as distinct events, and their impacts, such as damaged houses or lost crops, can be assessed soon after they occur. Slow-onset hazards such as heat stress do not arrive as a single event. She described heat as a "slow poison" whose impact is no less real but builds up gradually. She noted that such impacts are often not quantified in the same way as rapid-onset events, and that households therefore bear much of the burden silently.

She acknowledged that heat stress is already widely discussed and that one of the assessment reports of the Intergovernmental Panel on Climate Change (IPCC) includes a dedicated chapter on cities that covers heat in considerable depth. However, she argued that certain aspects remained unexplored, and the study was designed to address three of them. The first is that discussions of heat and work usually focus on outdoor workers. Indoor workers who perform physical labour in cramped rooms or poorly ventilated factories also suffer dehydration and the effects of extreme heat. Second, heat exposure is usually considered only during working hours.

Yet workers return to homes where they should be recovering before the next day's work, and conditions at home affect that recovery. Third, the study sought to quantify non-economic impacts such as anxiety, irritability, and depression, which are often left out because suitable methods to measure them are lacking.

Study Design: Four Cities, Around 700 Households and the 3P Framework

The study covered two countries. In Bangladesh, the survey was conducted in Dhaka, and in India it covered Delhi, Ajmer and Agra. Ms. Bharadwaj explained that these cities were chosen for three reasons: they are among the most heat-exposed, they allowed the study to cover both indoor and outdoor workers, and the research team had strong local partners there. The team worked with partners who follow do-no-harm principles. In total, around 700 households were surveyed across the locations.

The study used IIED's Comprehensive Climate Impact Quantification (C-CIQ) toolkit, which is built on a "3P" framework of predisposing, precipitating and protective factors. Ms. Bharadwaj explained that the same toolkit is used to assess floods, droughts and other climate impacts, because climate risks do not operate in isolation. They act on top of existing vulnerabilities and forms of marginalisation. If only the precipitating factor, in this case heat exposure, were examined, the study could not explain why different households in the same area experience the same heat differently.

The framework therefore examines how predisposing factors interact with the precipitating factor, and how the absence of protective factors increases vulnerability while their presence can reduce it. The predisposing factors considered included housing, water, sanitation, demographic characteristics, and employment conditions. The precipitating factor was assessed through weather and climatic data.

The Precipitating Factor: Rising Temperatures

On the precipitating factor, Ms. Bharadwaj presented temperature data for India from 1900 onwards. India's annual mean temperature has risen by about 0.95°C over this period, which is close to one degree. She stressed that the change in temperature anomalies was even more important. From around 1990 onwards, anomalies in annual mean temperature have increasingly been on the higher side. Anomalies in annual maximum temperature, which reflect the highest heat a worker experiences during the day, have also increased in recent times.

The peak years in the data corresponded to years in which India experienced El Niño. She noted that although El Niño is a weather phenomenon, its effects are felt more strongly because of the underlying effects of climate change. She added that this applies to the El Niño effects expected in the current and the coming year.

Predisposing Factors: Migration, Housing and Basic Services

Ms. Bharadwaj described predisposing factors as the underlying vulnerabilities that shape how much heat a worker is exposed to. The study first examined migration, because migrant workers arriving in cities are usually not permanent residents and typically settle in informal settlements. She contrasted this with people who move to cities with resources or with a job already secured, citing her own move from Bihar to Delhi and later to London for work. Close to 90% of outdoor workers and close to 77% of indoor workers in the sample were migrants, and most had begun migrating only within the last five years. She added a finding that was not on her slides: in eight out of ten cases, the factor that pushed households into migration was climate-related, such as lost crops, lost productivity, or lost land back home.

To assess predisposing factors, the team constructed a set of indices and valued them. One of these was a housing heat exposure index, based on roof type, roof height, per capita housing area, and heat intensity inside the house. Most workers were tenants, which meant they had little reason or ability to invest in improving their homes. Most outdoor workers lived under roofs of asbestos, tin sheets, tarpaulin, or gunny bags. These materials trap heat, so conditions inside the home resemble those outdoors. Roofs were low, under eight feet in most cases, so the living area remained exposed to the heat trapped beneath them. Most households lived in a single room shared by seven or eight people, usually with only one fan and no other means of cooling. Refrigerators were almost absent among outdoor worker households.

These conditions affected food and water security. Households reported going without adequate food for around 11 days. Both food shortages and food wastage increased during the peak summer months, because cooked food spoiled quickly without refrigeration. Water availability was also a problem, and toilet facilities were very poor. A single toilet served a large number of households, and there was not enough water to flush it. Because toilets were so limited, workers reduced their water intake, which in turn affected their ability to regulate their body temperature.

Protective Factors: Social Protection Entitlements and Workplace Conditions

Turning to protective factors, Ms. Bharadwaj said that, as someone who works extensively on social protection, she considers India's social protection system one of the best in the world. India has the Public Distribution System (PDS), with ration shops across the country. It was among the first countries to introduce One Nation One Ration Card, which makes food entitlements portable so that migrant households should be able to access food grains at their destination. For health, Ayushman Bharat provides cashless treatment at both government and private hospitals. There is also a labour welfare scheme for construction workers funded by the construction cess, and the e-Shram portal for informal workers.

However, the survey found that uptake of these medical facilities was weak. Many workers did not know about Ayushman Bharat. Among those who were enrolled, use was limited, partly because daily wage workers were unwilling to lose two or three days of work to seek treatment. Most workers were not enrolled in the labour welfare scheme, and many had not heard of the e-Shram portal.

The team also constructed a workplace facility index to assess conditions and heat exposure at work. Outdoor workers worked around 9.3 hours a day and indoor workers around 9.7 hours a day. Yet cool drinking water, electrolytes, and shaded rest areas fell well short of what was needed. The index also covered access to first aid and medical check-up camps at the workplace. Ms. Bharadwaj explained why such camps matter. Even a quick check-up can reveal that a worker has acute kidney injury or chronic kidney disease, so that treatment can begin in time. Without one, workers often learn of their condition only once it has reached a very serious stage.

Heat-protective work practices, such as a ban on midday work or job rotation, were very limited in most places. The quality of toilets at the workplace also determined how much water workers drank and how many breaks they could take. Finally, the team developed an index of the coping strategies workers adopted on their own. These included taking a cool bath after work, shifting work to early morning hours, covering their heads, resting in shade at the workplace, and carrying water with them.

Health Impacts: From Heat Cramps to Heat Stroke and Kidney Disease

Ms. Bharadwaj then presented the main findings. Five doctors were part of the research team and helped design the questionnaire and analyse the data. Clarifying that she is not a medical expert, she explained the three progressive stages of heat-related illness as described by the doctors.

The first stage is heat cramps. The body normally regulates its temperature by sweating, but sweating causes the loss of water and salt, and excessive loss produces painful muscle cramps. The doctors described these cramps as an early warning sign that the body is experiencing an adverse effect of heat. The second stage is heat exhaustion. Here, the body loses more water and salt and can no longer regulate its temperature at the pace at which it is being exposed to heat, which typically results in weakness, dizziness, and heavy sweating. The third and most serious stage is heat stroke, which can be fatal and occurs when body temperature rises above 40°C. At this stage, the body is exposed to acute kidney injury, which can develop into Chronic Kidney Disease (CKD) with continued exposure to heat.

For each stage, the team constructed a prevalence index on a scale of ten, based on the number of symptoms reported in the questionnaire. They compared summer and non-summer months for both indoor and outdoor workers. For heat cramps, workers reported very heavy sweating in the summer months. For heat exhaustion, symptoms included diarrhoea, nausea, fatigue and dizziness, and only around one third of affected workers sought medical treatment. For heat stroke, symptoms included reduced and very dark urine, a rapid and strong pulse, and loss of consciousness. Ms. Bharadwaj described the heat stroke findings as quite alarming. Even at this critical stage, only around 20% of affected workers sought medical treatment. The heat stroke prevalence index stood at around 5.4 out of 10.

The team also used a regression model to identify the drivers of each stage. Heat cramps were mainly associated with the intensity of physical labour and a lack of coping actions by workers.

Heat stroke, in contrast, emerged when workers were exposed to all the factors together. These included heat exposure, high body temperature, intense physical labour, and poor workplace facilities.

Non-Economic Impacts: Psychological Stress and Long-Term Effects

The study measured non-economic impacts through a psychological stress index, covering indicators such as difficulty in concentrating, irritability, anger, and anxiety. A video documentation team worked alongside the researchers. In the resulting documentary, many workers said that they become very angry during the summer and do not want to talk to anyone because they lack the energy.

Ms. Bharadwaj explained that IIED applies the C-CIQ toolkit to cyclones, hurricanes, and other climate impacts as well as to heat. The toolkit classifies impacts into four categories. Impacts may be tangible or intangible, and they may also be functional or intrinsic. Functional impacts affect workers' efficiency and livelihoods. Intrinsic impacts affect people's minds and health even where society or the economy places no value on them. The toolkit also considers the temporal and spatial dimensions of impacts, including how they change between the short and the long term.

Kidney disease illustrates why the temporal dimension matters. A worker who develops CKD is affected now, but will also be unable to earn a livelihood in the future, so both current and future impacts must be quantified. The study therefore assessed longer-term wage losses and the impact of heat-related kidney disease.

Quantifying the Losses: Kidney Disease, Workdays, Wages and GDP

Bringing these strands together, Ms. Bharadwaj presented the quantified losses for both countries, noting that Bangladesh showed trends broadly similar to India. Close to 18% of surveyed workers in India and 23% in Bangladesh showed symptoms of acute kidney injury. An estimated 4.8% of workers in India and around 6% in Bangladesh were expected to progress to chronic kidney disease, at which point they would sooner or later require dialysis.

The team then extrapolated these findings to the indoor and outdoor workforce in India's most heat-exposed states, using a methodology it offered to share. On this basis, around 26 million Indian workers could be exposed to CKD, and around 4,500 million workdays could be lost because of it. Wage earnings lost to CKD were estimated at around 0.58% of GDP in India and 0.47% in Bangladesh. She explained that these figures were meant to show the government the cost of inaction. As India pursues growth through initiatives such as Make in India, allowing its working population to fall sick would harm the economy.

The study also quantified the workdays and wages lost during periods of extreme heat. These losses arose from heat-related illness, insufficient work, and the closure of worksites. In India, outdoor worker households missed around 24 workdays and indoor worker households around 14.8 workdays. Ms. Bharadwaj clarified that the unit of analysis was the household rather than the individual worker. Over the full heat stress period, an outdoor worker household lost close to

USD 151 in wages and an indoor worker household around USD 89. She observed that the loss for indoor workers, though smaller, was far from negligible.

These workers already earn less than a living wage, and the wages lost to heat widen this living wage deficit further. The study combined the health-related impacts with the loss of workdays and the loss of efficiency from working in extreme heat. On that basis, the share of GDP lost was estimated at around 1.99% in India and around 1.3 to 1.4% in Bangladesh.

Policy Recommendations: Heat-Triggered Cash Transfers and the Role of Insurance

Ms. Bharadwaj then presented the study's recommendations, which the team has shared closely with the National Disaster Management Authority (NDMA) and other agencies. The losses are concentrated mainly in 13 Indian states with high heat intensity. Around 350 million workers in these states are engaged in heat-exposed physical labour. When the wage losses are extrapolated to all these workers, they amount to close to $36 billion a year.

Because not all years are equally hot, the study modelled three scenarios. She noted that India, particularly northern India, is a hot region, and that IMD data show around five to seven days of extreme heat stress even in a normal year. The team therefore used six days for a normal year, 12 days for a hot year and up to 18 days for a record year. She suggested that the coming year could be a record year for India, because a possible super El Niño would combine with the effects of climate change.

The core proposal is a heat-triggered cash transfer that pays workers their wages for the days of extreme heat, so that they do not have to go out and work. She acknowledged that some would object to paying workers for days on which they do not work. However, she argued that this is far more economical than allowing workers to suffer lasting damage to their bodies. The resulting disease burden would ultimately fall on the government, either through treatment under schemes such as Ayushman Bharat or through the loss of working-age population. Six days of paid wages in a normal year would cost around $ 0.66 billion, which is only 1.8% of the losses workers are already suffering. Twelve days in a hot year would cost around 3.7 billion. In a record year, the government would pay for up to 12 days, and the remaining days would be covered through insurance.

She explained that insurance is not suitable for the normal and hot-year scenarios, because heat stress of that level occurs every year. Using insurance for events that recur annually would drive premiums up sharply and make it less cost-effective. She also noted that almost every insurance company attended the national heat conference organised by

the Government of India earlier in the year. She commented on the frequently discussed SEWA insurance model, saying that it is a good model, but its payout does not equal even a single day's wage. As a result, it does not deter workers from working in extreme heat. In her view, compensation must be large enough that workers do not go out and harm their bodies. The study therefore compared direct cash transfers with a parametric insurance model. It recommended using insurance as a top-up in exceptionally hot years rather than every year.

Strengthening Existing Systems and the Cost of Inaction

Alongside heat-triggered cash transfers, the study recommends improving access to Ayushman Bharat through awareness drives, quick enrolment, and paid leave that allows workers to seek treatment. It also recommends raising awareness of the PDS so that workers can use entitlements they already have.

Ms. Bharadwaj then described how the team presents the case to the government. An extreme heat event of the kind expected once in 20 years could cause damage of around 11 billion USD in India. An early investment in resilience of around 2 billion could prevent this loss. If the event is instead allowed to unfold, India could end up spending close to 50 to 60 billion. On this basis, every dollar invested in early resilience would yield a benefit of USD 5.17. She emphasised that these estimates are based on grounded, grassroots data.

Regulatory Gaps in the New Occupational Safety and Health Code

Her final slide addressed India's new occupational safety and health code, which she said came out in May 2026 and combined around 13 earlier rules and laws. She welcomed the consolidation but identified three gaps.

First, the new code does not include any heat-related thresholds. Tamil Nadu, Maharashtra and Gujarat previously had their own rules setting a wet-bulb globe temperature threshold beyond which work was stopped, and these thresholds are absent from the new code. Second, the code applies only to establishments above a certain number of workers. This leaves smaller workplaces, street vendors and delivery workers without protection, even though smaller workplaces are sometimes more exposed to heat and need more support. Third, heat stroke and heat-related illness are not recognised as occupational diseases under the Employees' State Insurance scheme.

She argued that because heat stress in India is only going to increase, these are simple changes that should be made. The team has presented this case to the Ministry of Finance, arguing that implementing the recommendations would be far more cost-efficient than supporting workers after they have fallen ill.

Q&A and Panel Discussion

After the presentation, Prof. Namrata Chindarkar opened the panel discussion with the following questions.

Q. Governments have to decide where to direct limited resources. Should they compensate households or individuals for heat-related losses, or should they address the underlying causes of heat stress, such as emissions? In your engagement with the Ministry of Finance, has the thinking been to do both simultaneously, or to prioritise immediate impacts and deal with abatement later?

A. Ms. Bharadwaj described this as a pressing question globally. She framed it as the challenge of averting, minimising and addressing loss and damage all at the same time. On mitigation, she said she has mixed feelings about the current debate. India has argued in climate negotiations that developed countries caused global warming through their historical emissions and should take responsibility for it. More recently, the focus has shifted towards India and China as among the largest current emitters. She said that historical emissions cannot be ruled out.

She argued that alongside discussions about decolonising development, there is also a need to "decolonise the carbon space." Bringing populations in countries like India up to basic Sustainable Development Goal benchmarks means providing clean electricity, clean water, sanitation and a living wage. This requires development, including industries, factories and infrastructure, and development comes with emissions. At present, a large share of the global carbon space has been taken up by the Americas and Europe, whose per capita emissions are much higher. These regions therefore need to reduce their emissions substantially so that other countries can grow. At the same time, she cautioned that if India and China used this argument as a reason to keep polluting, everyone would be worse off. India needs room to grow, but it should grow responsibly, reduce emissions where possible and invest in cleaner technologies. She noted that India has already set large renewable energy targets.

She also highlighted super pollutants, such as black carbon and methane from municipal solid waste. She explained that carbon dioxide takes a long time to have an effect on temperatures once emissions are reduced, whereas reducing super pollutants brings down heat much faster. She cited the estimate, which she attributed to the Paris Agreement context, that reducing super pollutants could lower global temperatures by 0.5°C. She described this as a significant opportunity that can be achieved, and one that India should push for, since it would also reduce the heat stress workers currently face.

On household-level support, she drew an analogy with MGNREGA, which guarantees 100 days of wage employment to rural households. The scheme was created because agricultural employment is seasonal and does not provide work throughout the year. Without it, rural workers would migrate to cities that are not equipped to absorb them, and the scheme also helps build rural infrastructure. Schemes on health, public distribution and rural livelihoods were likewise created in response to development needs. Climate risk, she said, is now a new challenge of the same kind. Responsibility for it has often been pushed onto global climate funds, but India cannot wait for international finance to arrive while its workers are suffering. The losses that workers individually bear, in their bodies and in their wages, are far greater than what it would cost to support them. Supporting them therefore makes economic sense, because the burden will ultimately fall on governments themselves.

Prof. Chindarkar observed that this is exactly the wider discussion, and even debate, taking place on the issue, before moving to participants' questions.

Q. How were the wage losses and GDP losses calculated, and were they based on survey data? What were the data sources for the benefit-cost ratio?

A. Ms. Bharadwaj explained that the losses were calculated from the study's survey data, which covered slightly more than 700 respondents across indoor and outdoor work. The team ensured that the sample included both groups. The findings were then extrapolated to heat-exposed workers to calculate the wage losses, the health impacts, and the resulting GDP losses. She said the full methodology is presented transparently in the reports. The C-CIQ toolkit, including the 3P approach and the steps for economic assessment, is also publicly available.

She added that IIED not only applies the methodology itself but also trains national and grassroots organisations to use it and is currently supporting close to 35 research organisations in different countries. The aim is for countries, particularly least developed countries, to generate their own evidence so that they can make a stronger case for climate finance.

The benefit-cost ratio, she clarified, came from a separate IIED study published the previous November. That study focused on social protection, making the case that governments need only add a small layer to existing social protection programmes. It compared what governments would pay if they did not act early with the benefits of acting now. To do this, the team ran 10,000 simulations to estimate loss exceedance probabilities, in a manner similar to that used by the insurance sector. She shared links to both the toolkit and this study in the chat.

Q. How can insurance-based policies be designed and implemented more fairly, particularly with reference to the SEWA model? What would a good insurance instrument for compensating heat-related losses look like?

A. Ms. Bharadwaj said that insurance is a financial safety net and is good to have, but it should be seen as one solution within a basket of solutions and not as a panacea. She recalled making the same point to an official from the National Disaster Management Authority at a heat stress workshop. Her concern is that insurance is increasingly being presented as the only solution. She gave the example that if a farmer loses crops to hailstorms every year, insurance is not the answer. Heat stress follows the same logic in countries like India, especially in the northern states, and southern states have also begun to experience heat stress in recent years.

In normal years, or years slightly hotter than normal, losses should be covered through government social protection. Insurance makes more sense for events with around a 5% loss exceedance probability, meaning events that occur roughly once in 10 or 20 years. If insurance were used to make payouts every year, premiums would rise so steeply that neither households nor governments could afford them.

She described IIED's work with small island developing states as an example of a different approach. Instead of insuring individual assets such as damaged infrastructure or collapsed buildings, the approach insures a country's GDP loss through a risk pool across 39 countries, at levels such as 20%, 50% or 100% of GDP loss. Because losses of that scale do not occur every year, perhaps once in five years, the premium works out far lower than the losses covered. When such a loss does occur, the insurance pays out and provides a financial safety net.

Q. Did the study distinguish workers by sector, for example agricultural versus manufacturing workers?

A. Ms. Bharadwaj replied that the study distinguished only between indoor and outdoor workers. However, IIED has separately collected extensive data on rural agricultural workers in Madhya Pradesh, Rajasthan and Uttar Pradesh. That study examines how heat stress affects these workers, including their working cycles and efficiency.

She explained that India's Schedule of Rates, which sets out the expected physical work for different agro-ecological zones and soil types, has not been revised for a very long time. As heat stress and other climate impacts increase, it needs to be updated. IIED has therefore requested the National Institute of Rural Development in Hyderabad, which has previously carried out time-and-motion studies for this purpose, to conduct a new one. The institute can draw on state government machinery to do so and revise the Schedule of Rates, which would raise wage rates. She noted that the data from this rural study have been collected but not yet published.

Q. Given that the C-CIQ methodology produces these estimates of earnings losses, why not integrate the findings into existing programmes rather than creating a new cash transfer or wage-loss compensation scheme? Existing programmes are already designed around other development goals, so layering onto them might be a better approach.

A. Ms. Bharadwaj said she supports the idea that new programmes should not be created where existing ones can be built upon. She pointed to IIED's Anticipatory Social Protection Index for Resilience (ASPIRE), the toolkit used in the benefit-cost study. It assesses 37 indicators at the policy and systems level, and 33 indicators at the delivery level, in order to identify small changes that can make existing social protection and development programmes work for climate resilience as well.

The difficulty in India, she explained, is that there is no existing cash transfer programme to build on. The team examined almost all existing schemes to see whether the proposal could be dovetailed with any of them. The only cash transfers India has had were a one-time transfer to women holding Jan Dhan accounts during the COVID-19 period and the PM-KISAN scheme. Building on PM-KISAN would limit support to farmers. If the rural study leads to recommendations, the team would probably suggest adding a layer to PM-KISAN, but landless labourers would also need to be considered. Where no base programme exists, something new has to be created.

She agreed that countries like India cannot afford to design programmes from scratch where existing ones can be used. This is why the study recommends dovetailing with the PDS and Ayushman Bharat, while proposing a new scheme only for the cash transfer.

Q. Did the study observe gendered impacts, particularly on women informal workers, and on the unpaid work that women do?

A. Ms. Bharadwaj said the gendered impacts are very large and that IIED plans a follow-up study focused specifically on them. Women often work under similar heat exposure, are paid

less for the same exposure, and then return home to cook in extreme heat. In her view, these impacts are far greater than those experienced by men. The team deliberately kept them out of the present reports because adding too much data can dilute the policy messages that need to be delivered clearly. She added that if others are researching this area, IIED would be glad to highlight their work.

Q. How can heat stress be addressed for MSMEs, given that the new occupational safety rules apply only to establishments above a minimum number of workers and no longer include temperature thresholds beyond which work must stop?

A. Ms. Bharadwaj said it was very disappointing that, after extensive deliberation, the new law had diluted these worker safety measures. IIED intends to work with labour unions, building and construction workers' bodies and other worker organisations to press for a wet-bulb globe temperature threshold beyond which work should stop. She said the organisation will need to advocate strongly with the Ministry of Labour, through unions and worker collectives, for these protections to be brought back.

She explained that work stoppages must be paired with cash compensation. When the team interviewed workers, they said that large construction sites close during heatwaves. Workers then have to walk further and take on more difficult work, which exposes them to even more heat. Stopping work without compensating lost wages could therefore push workers into work that is even more harmful to them.

At the same time, she acknowledged that MSMEs operate on very thin profit margins. Requiring them to stop work is easy to propose, but they would also need support so that they do not collapse as a result. All of these considerations, she said, need to be weighed carefully.

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Key Takeaways and Conclusion

The webinar presented heat stress as a serious but under-measured form of climate-related loss and damage. Ms. Bharadwaj described it as a "slow poison" that builds up gradually and is borne silently by households. The study addressed three aspects often left out of discussions on heat and work: the exposure of indoor workers, exposure at home after the working day, and non-economic impacts such as psychological stress. Using the 3P framework, it showed that heat acts on top of existing vulnerabilities. Most surveyed workers were migrants living in crowded, heat-trapping homes with scarce water and poor sanitation. Many were unaware of or not enrolled in social protection entitlements that already exist.

The health and economic findings were a central takeaway. Only about a third of workers with heat exhaustion symptoms, and around 20 per cent of those with heat stroke symptoms, sought treatment. A notable share showed symptoms of acute kidney injury, and some were on a path towards chronic kidney disease, which affects future as well as present earnings. Combining health-related and wage-related losses, the study estimated the share of GDP lost at around 1.99 per cent in India and 1.3 to 1.4 per cent in Bangladesh.

On policy, Ms. Bharadwaj proposed heat-triggered cash transfers that pay workers their wages on extreme heat days. Six days of paid wages in a normal year would cost around 0.66 billion, or 1.8 per cent of the losses workers already bear. She argued that insurance should serve only as a top-up in record heat years, and that existing schemes such as the PDS and Ayushman Bharat should be built upon rather than replaced. She also called for India's new occupational safety and health code to include heat thresholds, cover smaller workplaces and recognise heat-related illness as an occupational disease. At the same time, she acknowledged that MSMEs operating on thin margins would need support of their own.

The discussion also touched on the need for developed countries to cut emissions sharply and for India to grow responsibly, including by reducing super pollutants. She noted that gendered impacts of heat will be examined in a separate study. The overall message was that protecting informal workers from heat would cost far less than the losses they already absorb. With heat stress in India expected only to increase, she argued that governments should act now on grounded evidence rather than pay far more later.

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