



ILR Global Labor Institute

HIGHER GROUND?

Fashion's Climate Breakdown and its Effect for Workers

English Workers Brief

Introduction

Rising heat and intense flooding are connected with climate change all over the world, including in Bangladesh, Cambodia, Pakistan, and Vietnam. They interrupt apparel [garment] workers' lives and can cause illness. They also interrupt or slow down work in apparel factories. High heat and flooding will cost employers and workers hundreds of billions of dollars in lost earnings and millions of jobs by 2030 and 2050.

In this report from Cornell University Global Labor Institute and Schroders—a global investment firm—our top question is: What are the risks for apparel workers from climate change and how much economic damage will it do?

To answer this, we compare estimates for future temperatures and flooding in 30 apparel production centers around the world. Second, we look closely at the impacts for apparel workers in four countries: Bangladesh, Cambodia, Pakistan and Vietnam. And we look at how climate breakdown is already affecting garment workers. Then we compare laws and regulations about heat, sick leave, and social protections in these four countries. Finally, we suggest changes that unions, employers, governments, apparel buyers and investors should make now to protect workers and apparel manufacturing from high heat and intense floods.

1.0 Impacts of extreme heat and flooding

High heat and humidity combine to make work and life difficult for workers. They can cut deeply into [reduce] productivity at work and workers' earnings, and they can harm the health of workers and their families. 'Heat stress' in a garment or footwear factory can lead to exhaustion, fainting and even heat stroke. The 'wet-bulb globe temperature' (WBGT) combines heat and humidity in one number. Wet-bulb numbers are usually lower than regular temperatures but a wet-bulb temperature of 30 C and higher means higher heat-stress for workers. At around 30 C WBGT, the experts say that apparel workers should rest for 30 minutes in each hour. At 35 C WBGT and higher, workers can have serious health problems even if they are doing very little work.¹

The table [graph, numbers] below compare how many days in 2030 the heat stress (with WBGT above 30.5 C) will be high for workers in cities that produce garments and footwear. Karachi will have the most days with high heat and humidity: 190 days in 2030 and 203 days in 2050. Other cities in our report will also be high: Dhaka, Chittagong, Ho Chi Minh City and Phnom Penh.

Table 1. High heat stress days, 2030 and 2050, by city.

Apparel production cities		How many days per year of high heat stress?	
City	Country	2030*	2050
Karachi	Pakistan	190	203
Colombo	Sri Lanka	145	158
Managua	Nicaragua	133	151
Port Louis	Mauritius	104	104
Dhaka	Bangladesh	65	105
Yangon	Myanmar	59	92
Delhi	India	55	75
Ho Chi Minh	Vietnam	55	98
Chittagong	Bangladesh	50	85
San Salvador	El Salvador	42	57
Bangkok	Thailand	42	75
Phnom Penh	Cambodia	41	75

We have ILO data from the Better Work program in Cambodia. The ILO audits all exporting apparel and footwear factories and checks temperatures and ventilation in the early afternoon when it is hottest. A temperature above 32 C in the factory is too high—a violation. From 3,000 ILO visits to Cambodian apparel factories between 2015 and 2022, we see that:

- Workers in one in five factories during this seven-year period worked on days when the indoor temperature was over 35 C.

¹ Our estimates are based on the SSP 2-4.5 climate scenario. This future scenario is 'middle-of-the-road'—not optimistic and not pessimistic—and assumes that global temperatures will rise slightly higher than the limits set at the Paris COP negotiations in 2016.

- Nearly two-thirds (64 percent) of factories had indoor temperatures above the ILO's heat standard and 69 percent of those factories had temperatures inside the factory that were higher than the temperatures outside the factory.

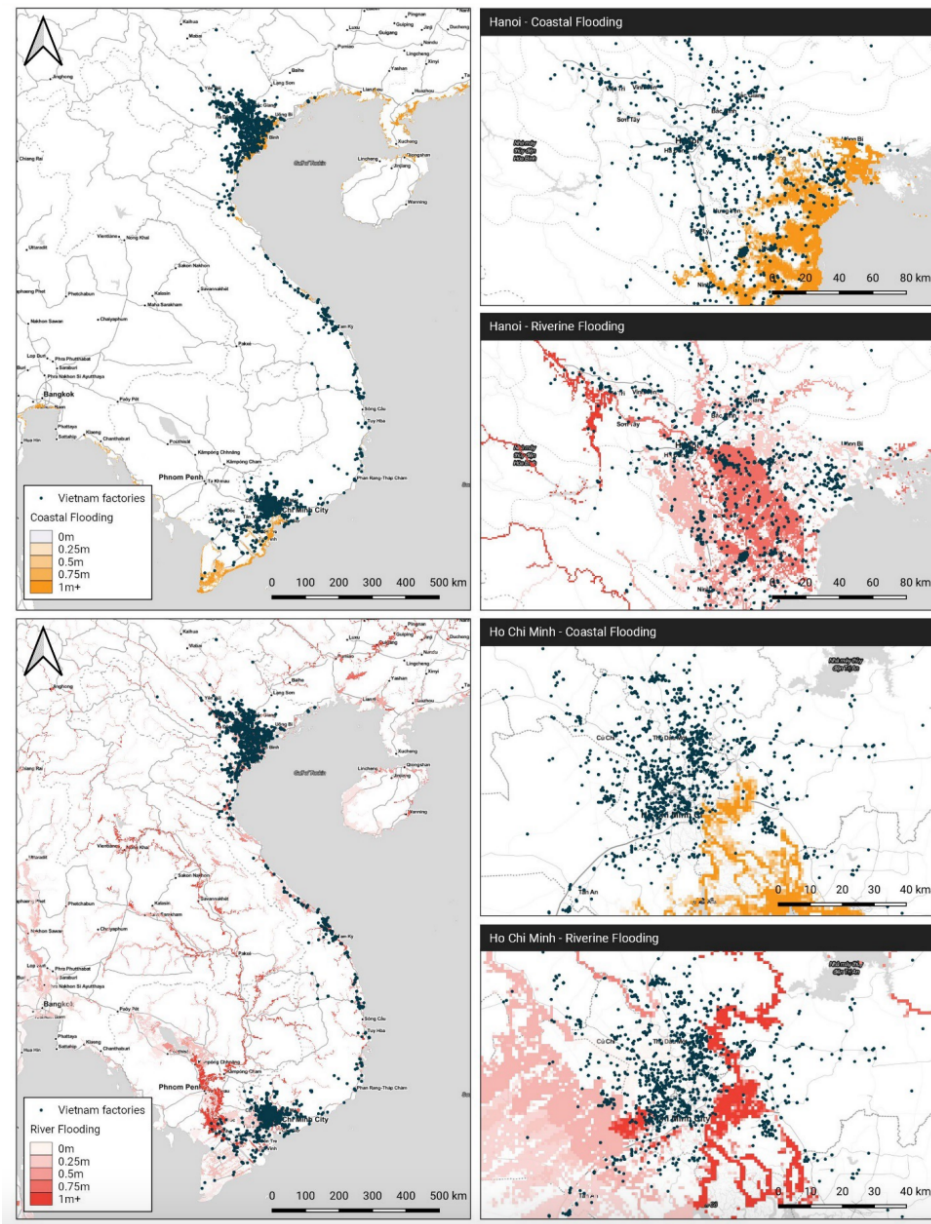
The data show that Cambodian factories are getting better over time, but slowly. But the ILO is not collecting this data in factories in the Better Work programs in Bangladesh, Pakistan and Vietnam.

In our report, we estimate the impact of high heat for workers in apparel factories in 2030 and 2050. If factories are not cooled on hot days, workers' productivity falls. Workers can produce 1 – 2 percent less for every 1 C WBGT increase in the temperature. For example, a 32 C WBGT means that workers produce 7 – 14 percent less on that day. This lowers earnings for the employer and workers. The apparel industry will grow at a slower rate and create fewer new jobs. For Bangladesh, Cambodia, Pakistan and Vietnam, we calculated how much income (export earnings) and jobs the industry will lose if workers and factories are not protected from high heat and humidity.

Flooding will also be higher in the future. In our report, we estimate how many days of work will be lost for floods in 2030 and 2050 in the four countries. In the map below, we show how many factories (blue dots) in Vietnam will be affected in a significant flood from rainfall and high rivers (red) sea flooding (gold) in 2030.



Figure 1. River, rainfall, and sea flooding in Hanoi and Ho Chi Minh City, Vietnam, in 2030.



A bad flood year in Bangladesh could mean that 32 percent of all garment-exporting factories could be disrupted for many days from river and sea-coast flooding of 0.5 meters or more. In Vietnam, 31 percent of factories are at risk. In Cambodia, the risk is lower: 11 percent of factories. In Pakistan, it is the lowest: 5 percent.

We calculate the possible losses in export earnings (in US dollars) for the apparel industry in each country below for two years: 2030 and 2050.

Table 2. Apparel export earnings ‘losses’ by country, 2030 and 2050.

Country	Year	‘Losses’ in earnings without adaptation (USD)	Change (percent)
Bangladesh	2030	-26.8 b.	-21.95%
	2050	-711.3 b.	-68.51%
Cambodia	2030	-6.8 b.	-18.94%
	2050	-156.3 b.	-66.40%
Pakistan	2030	-7.6 b.	-30.94%
	2050	-180.7 b.	-80.52%
Vietnam	2030	-24.8 b.	-21.20%
	2050	-378.3 b.	-65.74%

The earnings ‘lost’ in the future because of high heat and flooding are USD 65.89 billion in 2030 for all four countries added together. That is 22 percent lower than export earnings would be if the apparel industry invested quickly to protect workers from high heat and flooding with factory cooling systems, better air-flow and defenses against flooding, for example. These ‘adaptation’ investments would help employers, workers and their families cope with the losses and damage from climate change.

Table 3. Apparel jobs ‘losses’ by country, 2030 and 2050.

Country	Year	‘Losses’ in jobs without adaptation	Change (percent)
Bangladesh	2030	-255,067	-5.29%
	2050	-1,272,594	-20.17%
Cambodia	2030	-52,944	-5.63%
	2050	-556,545	-32.76%
Pakistan	2030	-296,915	-8.65%
	2050	-1,854,537	-34.56%
Vietnam	2030	-353,301	-7.53%
	2050	-4,957,201	-42.38%

The number of jobs lost in the four countries will be 958,227 in 2030.

The losses for 2050 will be much higher as temperatures rise and floods are more severe. Apparel exports in these four countries will be 69 percent lower and there will be 8.6 million fewer jobs if the employers, governments and buyers do not make investments in climate adaptation.

2.0 What does climate breakdown mean for workers?

Floods in workers’ neighborhoods can cause delays in getting to work. Some workers in Dhaka and Chittagong use boats to get to work. Lost hours for workers means lost wages. And flooding can lead to illnesses: rashes, diarrhea and dengue. High heat can lead to headaches, dehydration, dizziness, even fainting. This can mean higher medical costs, and lost wages.

In Dhaka, Bangladesh, BRAC University researchers met with workers and factory managers to hear about the heat and flooding problems. Workers’ biggest worry in all of the group meetings was lost wages and many said they ‘just push through’ the months of May, June and July when temperatures and humidity are high and the city is flooding.

Workers also described struggling to meet daily production targets which were not adjusted to allow for the high heat. Workers reported that they were docked pay (marked late) even if they were a few minutes late due to flooding or were denied paid leave if they fell sick. And workers reported missing three full days of work per month due to illness from heat and flooding in the hottest and rainiest months of the year. This means lost wages of BDT 1,200 – 1,500 (USD 11 – 14) per month, or more than 10 percent of their income.

Finally, workers in Bangladesh estimated that they spend BDT 3,500 (USD 31) for medicine and BDT 2,000 (USD 18) for electricity at home in the hottest months when they use fans constantly to help them to sleep. Workers reported borrowing against their personal belongings and paying high interest rates to afford electricity and medicines in May, June and July.

Employers generally downplayed the extent to which temperature affected workers. All of the managers of Dhaka-area factories interviewed reported taking measures to cool factories, and eight of ten managers interviewed said that there were no complaints about heat from workers or unions.

Surveys of Cambodian workers show that at least 25 percent (of 200 workers interviewed) reported higher heat stress in 2022 and 22 percent of workers said that heat stress affected their ability to work. In Karachi, Pakistan, heat waves are becoming more dangerous. An ambulance company there reported that more than half of the people who died during a 2018 heatwave were factory workers living in poor neighborhoods around Karachi.

3.0. Do labor laws protect workers from climate breakdown?

How strong are the laws that protect workers from high heat and flooding in Bangladesh, Cambodia, Pakistan and Vietnam? Indoor heat limits for factories do not exist in the laws in Bangladesh, Cambodia and Pakistan. Cambodia's labor law is the weakest in the group: there is no indoor heat limit and there are no requirements for paid breaks, paid sick leave, paid work stoppages, or rights during work stoppages, allowing employers to avoid paying some severance obligations.

Vietnamese labor law is the clearest of the four countries. But in all four countries enforcement of the laws is weak according to workers and observers. This chart compares the parts of the laws that are important for climate change and especially heat.

For factory audits for brands, the ILO Better Work program has the clearest standards. But the fashion brand codes of conduct are weak on climate issues that affect workers.

	Bangladesh	Cambodia	Pakistan (Sindh)	Vietnam
Indoor heat	Temperature 'limited to a tolerable limit', with requirement for one thermometer per workroom.	'Work [must be] undertaken in a thermal environment that does not affect worker's health... Employer must take appropriate heat reduction measures.' Requirement for 'thermometers in the workplace.'	Maintain indoor temperatures for 'reasonable conditions of comfort and [prevention of] injury to health' with wall and roofs 'of such material and so designed that such temperature shall not be exceeded. 'Correct wet and dry bulb temperatures' recorded three times/day.	Indoor workplace temperatures should not exceed 34°C, 32°C and 30°C for light, medium and heavy work, respectively. Relative humidity should not exceed 80%. Employer contracts for assessment of temperature, humidity, etc.'
Indoor ventilation	A sufficient 'number of opposite facing windows in every workroom' for ventilation, and 'exhaust fans where ventilation is not possible.'	'Employer has to take measures to ensure appropriate air circulation.'	'Ventilating opening' in proportion to 'five square feet for each person' is required 'such as to admit a continuous supply of fresh air.'	'Clean air must be regulated [based on] quantity of people in a room, the demand for manual labor, workshop size, the emission of pollutants, thermal conditions, [and] the light must be sufficient.'
Clean drinking water	'Pure' and cool water for drinking by workers, 'changed at least once in a day' unless using 'modern purifying systems.'	'Workers must be supplied with water for all their needs, in every season.'	'Sufficient supply of wholesome drinking water' at less than 32 Celsius, 'free of charge', 'at the rate of 1 gallon per worker.'	Employer must provide 1.5 liters of clean, tested drinking water 'per person, per shift.'
Breaks	No more than 6 hours without rest of at least 1 hour. No more than 5 hours without rest of at least half an	No more than 8 hours per day for 'full-working period'. Working periods are set by each enterprise.	No more than 6 hours without rest of at least 1 hour. Or no more than 5 hours without rest of at least half an hour.	Six hours or more work shall include at least half an hour break and 45 minutes break for night work.

	hour.			
Paid breaks	No specific standard.	No specific standard.	No specific standard.	The legally required rest period is paid and counted as 'part of the working hours'.
Stop work in dangerous conditions	No specific standard.	No specific standard.	No specific standard.	'Workers [can] refuse to perform work or to leave a workplace that clearly presents an imminent and serious threat to life or health' and cannot be required to return/resume work until danger is eliminated.
Paid work stoppage	Workers must be paid for 1 – 3-day stoppages by 'fire, catastrophe, stoppage of power supply, and epidemics', but may be laid off for stoppages of more than 3 days.	No prior lay-off notice required for 'acts of God' or catastrophe causing material destruction and make it impossible to resume work for a long time.'	No specific standard.	Minimum wage, at least, must be paid for 'force majeure' or 'forced work stoppage'.
Paid sick leave	'Every worker shall be entitled to sick leave with full wages for 14 days' given a 'medical practitioner certifies that the worker is ill.'	No specific standard.	'Every worker shall be entitled to 16 days in a year sick leave on full pay.'	Paid sick leave up to 180 days per year with medical certification (based on level and period of social insurance contribution).

4.0 What do we do?

We have recommendations for 'adaptation' actions by governments, employers, brands and worker organizations. Three are especially important.

- The apparel industry should invest in adaptation, not 'cut and run' to countries where there are fewer climate risks.
- Higher wages and good social protection systems for workers can help workers and their families avoid the worst effects of climate breakdown.
- Unions and labor rights organizations should include protections from climate impacts such as heat and flooding in bargaining with employers and brands, and in social dialogue with government and industry associations.

Other recommendations include:

- Change work hours, effort levels, rest and hydration based on indoor wet- and dry-bulb standards
- Set rules for daily collection, reporting and action on temperature and humidity readings in the production areas of factories
- Treat heat and flood events as health hazards with paid leave for events and related illnesses, the right to stop work—all without penalty for workers
- Early warnings systems and mass campaigns for workers re heat-stress or flooding

The full reports from Cornell University and Schrodgers are available in English at <https://www.ilr.cornell.edu/global-labor-institute>.