
Just Transitions within Sectors
and Industries Globally

Just-in-Time Transition?

*Industrial sustainability, decent work, and the
production of climate precarity in the Cambodian
garment industry*

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About Just Transitions within Sectors and Industries Globally

The programme examines how just transitions whilst tackling climate change and biodiversity is key to supporting inclusive economies and societies in the future. Through the programme, the Academy awarded funding to nine research projects exploring the actions required in sectors and industries globally across supply and value chains, with a focus on key economic emitters or areas of society that will help reduce and/or eliminate greenhouse gas emissions. The programme was funded by the UK's Department for Business, Energy and Industrial Strategy.

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Executive summary

Climate change is no longer a future problem. It is force reshaping the terms of the global workplace, reordering social relationships,¹ reducing productivity,² and worsening worker health.³ Yet in the drive towards industrial decarbonisation, the everyday struggles of workers in global supply chains battling worsening economic and physical conditions have received little attention, whilst worker voices have been marginalised. In climate change terminology, a focus on adaptation has taken a back seat to mitigation measures. Yet as the evidence of ongoing climate change impacts builds, this imbalance of focus is resulting in workers absorbing the pressures of climate change without support.

This report exemplifies this issue through the global garment sector: one of the world's most polluting and carbon intensive industries, as well as one of its biggest employers. Reflecting growing interest in sustainability in garment supply chains, industrial decarbonisation programs are increasingly prevalent and well-funded in the global garment industry. Yet these initiatives focus overwhelmingly on carbon mitigation within the primary supply chain, leaving the impact of climate change on garment sector workers largely absent from policy in the sector.

Within the global garment industry, Cambodia represents a typical “cut-make-trim” intermediary in the global value chain. With the UK one of its primary export destinations, the Cambodian garment industry's labour conditions have been rigorously scrutinised through the ILO's Better Work program. Yet despite the Cambodian government's target of ‘pursuing resource efficiency and sustainability by implementing the principle of sustainable consumption and production’,⁴ this vital climate change-labour nexus is largely absent from the industrial policy and governance of Cambodia's decarbonisation transition. In addition, despite widespread awareness of local environmental impacts such as flooding and excess heat linked to climate change, neither factories nor unions have yet formulated a coordinated policy linking the growing risk of climate change to local environmental impacts already being experienced in the workplace.

This report finds that climate change is a pressing issue for workers in Cambodia's garment industry. The majority of garment workers (67%) are aware of climate change, of which 74% reported feeling concerned. Crucially, moreover, climate change is not a future problem for garment workers, but one which is already impacting garment workers' lives, with over two thirds (67%) currently experiencing climate change impacts. This report combines quantitative climate perception and survey data with qualitative accounts from workers, union representatives, industry figures, government and monitoring bodies to explore the experience of climate change-linked environmental impacts within the Cambodian garment industry. Its overarching goal is to highlight how the structural characteristics of the global garment industry shape and intensify the impacts of climate change for workers. Specifically, it highlights three dimensions of garment worker vulnerability to climate change.

1 Natarajan and Parsons, 2021
2 ILO, 2019
3 ILO, 2019
4 Royal Government of Cambodia, 2021: 12

First, it examines garment workers' perceptions of climate change **within the workplace**, where the majority of garment workers (55.5%) report experiencing at least one environmental impact within their factory in the last 12 months, with the most common one being air pollution at 30.5%, followed by extreme heat (25.5%), flooding (9%), fires (6%), pests (3.5%) and water pollution (2%). A key finding presented in this section is that workers on fixed term contracts are substantially more likely to perceive temperature changes than workers on unlimited duration contracts (85% versus 47%).

This highlights an important potential connection between industrial and worker flexibilization and vulnerability to climate change amongst the industrial workforce. Further underscoring this, the data indicate a significant impact in terms of workplace productivity and attendance. In total, 22% of workers experiencing heat stress reported that it compromised their ability to work, whilst a further 6% stated that they had missed days of work as a result of excess heat. This translates to a 2.75% reduction in overall productivity across the survey, which extrapolated to the country as a whole, would translate to an average annual reduction in the value of good exported of 290 million USD.

The report secondly explores how worker livelihoods are being affected **outside the workplace**. In total, 29% of workers reported experiencing extreme weather or other disasters at their accommodation in the last 12 months. Of those who did, the most commonly reported issues were flooding at 63% and extreme heat at 42% of workers. The most common result of flooded accommodation was health problems, reported by 38% of workers. In addition, 42% of workers experiencing excess heat in their accommodation reported health problems, with 67% of those reporting heat stress in their accommodation stating that it had affected their health, compared to 53% inside the factory.

The third section of the report explores **the translocal connections between rural and urban climate change impacts**. Economic linkages provided by remittance flows spreads risk across rural-urban networks, and with it the impacts of climate change. Rural impacts on agricultural activities mean increased remittance payments from garment workers, heightening pressure on their livelihoods. Urban impacts, such as the economic losses incurred through excess heat or flooding, conversely result in diminished remittance payments, placing additional strain on rural livelihoods already struggling to adapt to the changing climate. A key finding is that garment worker households perceive climate change differently to non-garment worker households. In 14 out of 15 climate change indicators, households containing garment workers are more likely to perceive changes in the climate.

As such, the data allude to a wider underlying logic linking the experience of climate change to garment work. Agricultural practices undertaken by garment workers' rural households, are more likely to centre on capital-intensive, often environmentally destructive, practices such as chemical fertiliser use. Consequently, the growing investments necessary to sustain agriculture under conditions of growing environmental risk and diminishing soil fertility may result in heightened pressures on garment workers to remit, even as climate change renders their income less stable and their workplaces less healthy.

Taken together, these three dimensions of climate change in the garment industry reflect a complex and multi-faceted issue. On the one hand, high pressures on cost and turnover for factories are frequently passed on to workers. On the other, limited oversight of the environment in which work takes place allows low levels of investment in mitigation measures such as fans, ventilation and drainage to persist. Viewed from this perspective, the flexible, unintegrated, just-in-time structure of the industry as it stands presents a major barrier to effective industrial adaptation to the growing pressures of climate change. In this report, we argue that centring worker voices in Cambodia's and the wider industry's response to climate change, is key to ensuring that the costs and risks of climate change are not borne overwhelmingly by workers and thus to achieving a just transition in the garment industry.

1.0 Introduction: Just-in-time transition

“The way we make, use and throw away our clothes is unsustainable” reads the UK Parliament’s call to action on clothing consumption and sustainability.⁵ Garment production “contributes more to climate change than international aviation and shipping combined, consumes lake-sized volumes of fresh water and creates chemical and plastic pollution”. At the same time, whilst providing employment for 75 million workers globally, garment production is recognised as a source of indecent work: characterised by low wages, long hours, dangerous conditions, and workplace harassment and bullying. Sustainable Development Goals 8 & 13 target Decent Work and Climate Action, creating an imperative for research and policy to address the twin labour and environment challenges posed by global garments manufacturing. Yet it remains a key gap in theory and policy.

To date, corporate sustainability programmes, regulatory experiments, and consumer action have directed significant investment towards both ‘fashioning justice’ through labour standards⁶ and ‘transitioning to a sustainable fashion industry’.⁷ The ILO/IFC’s Better Work, for example, monitors labour standards in 1700 factories globally, whilst major buyers such as H&M are investing millions to reduce carbon footprints. Nevertheless, despite this dual interest, these schemes tend to view the labour and environment aspects of garment sustainability as discrete, relating to emissions mitigation on the one hand, and working conditions on the other. This separation of the labour and environmental dimensions of global supply chains obscures a crucial dimension of climate change: the impact of the industrial workplace on workers’ experience of the changing climate.

This is equally true in the context of Cambodia. Despite the Cambodian government’s target of ‘pursuing resource efficiency and sustainability by implementing the principle of sustainable consumption and production’⁸, this vital climate change-labour nexus is largely absent from the industrial policy and governance of Cambodia’s decarbonisation transition. The result is twofold. First, the local impacts of climate change on worker livelihoods are rarely considered, leaving workers increasingly subject to ‘climatic precarity’⁹ shaped by combined environmental and workplace pressures. Secondly, the local environmental impacts of industry are neglected in favour of headline decarbonisation figures, allowing environmental degradation such as water overuse, liquid and airborne effluents and deforestation to intensify the impacts of climate change for workers and their rural households.¹⁰ In neglecting the economic security of workers in this way, therefore, garment sector sustainability initiatives preside over a ‘just-in-time’ transition, leaving workers subject to climatic precarity at the nexus of low wages and intensified environmental risk.

5 Environmental Audit Committee, 2019:3

6 Clean Clothes Campaign, 2021

7 UNIDO, 2020

8 Royal Government of Cambodia, 2017: 12

9 Natarajan et al., 2019

10 Parsons et al., 2021

As outlined in this report, this just-in-time transition results from a widespread onus of corporate sustainability programming towards “lean and green” production:¹¹ the widespread consensus in scholarship and policy that more efficient and flexible production processes are an effective route towards supply chains that are both low-carbon and low-cost. As a result, sustainability initiatives enacted by brands sit in parallel to wider processes of disintegration and flexibilisation of labour and production management. Yet as this report aims to show, this approach neglects the crucial aspect of climate change impacts on the industrial workforce. In Cambodia, a context reflective of multiple intermediary producer sites in the global South, these impacts are significant, affecting worker health, livelihoods and productivity. Yet they reflect a wider, industry-wide, issue derives from the disintegrated relation between producer factories and global buyers. With producer profit margins low, capital stocks depleted by the COVID-19 pandemic, flexible contracts meaning future relationships with a buyer are not guaranteed, and a high proportion of the industrial built infrastructure being rented rather than owned, there is a substantial structural disincentive for factories to invest in environmental management.

As we argue in this report, this disintegrated mode of production represents the most substantial obstacle to achieving adequate adaptation measures and mechanisms for workers in the garment sector, obfuscating responsibility and disincentivising investment in environmental management. The result is that the local environmental impacts of climate change are being borne overwhelmingly by workers, many of whom are experiencing substantial economic and health problems as a result. Our results suggest on the one hand that disintegration of production processes and flexibilization of labour within global supply chains work in direct opposition to worker wellbeing under climate change. On the other, they highlight the potential role of organised labour in improving these conditions and making global production safer and healthier for workers.

2.0 Climate change, labour and the garment sector in Cambodia: towards a just-in-time transition?

2.1 Just Transitions and just-in-time production: an unexplored nexus

Scholarly research into the intersection between climate change and labour is sparse, with environmental studies tending to ignore labour issues, and labour studies paying little attention to climate change issues.¹² This mirrored attitudes in the practitioner and activist world, with trade unions ‘typically represented as standing in the way of climate change measures’ and ‘environmental movements [being] slow to recognise the legitimacy of workers’ interests’.¹³ Thankfully, both are now changing, with increasing amounts of research into the relationship between labour and the environment^{14 15} and issues of climate justice and a just transition rapidly moving up trade unions’ agendas.¹⁶

Indeed, following its coinage by the global trade union movement in the 1980s, the concept of “Just Transition” has developed into a leading role in environmental strategy, foregrounding the role of “green jobs” as part of decarbonisation strategy.¹⁷ Defined as ‘a fair and equitable process of moving towards a post-carbon society’, the concept at base aims to ensure the concepts of equity and justice have a place within these processes of decarbonisation.¹⁸ Yet the breadth of the term has seen it interpreted in diverse and sometimes disconnected ways,¹⁹ often with limited engagement as to the wider political-economic dimensions at play.²⁰

Growing interest in the labour dimensions of environmental change in global supply chains remains at odds with the wider logic of global production.

More broadly, growing interest in the labour dimensions of environmental change in global supply chains remains at odds with the wider logic of global production, where interest in environmental sustainability has coalesced in recent years around

12 Rathzel and Uzzell, 2011: 1215
13 Rathzel and Uzzell, 2011: 1216
14 Natarajan and Parsons, 2021
15 Rathzel, Stevis, and Uzzell, 2021
16 ITUC, n.d.
17 McCauley and Heffron, 2018
18 McCauley and Heffron, 2018
19 McCauley and Heffron, 2018
20 Newell and Mulvaney, 2013

the concept of ‘green production’, emphasising ‘lean and green production concepts’ focused on waste reduction and efficiency as a means to achieve sustainability goals.²¹ This sustainability formulation has come rapidly to dominate scholarship on sustainable production, with the literature now evidencing an overwhelming consensus that ‘lean leads to green, and even more, that it facilitates a cultural organizational background that drives the formulation and achievement of green objectives like waste elimination and pollution prevention’.²² This drive towards “lean and green” approach to decarbonised production underway in the global garment industry has direct implications for the context in which workers (and their workplaces) face climate change, yet it constitutes a significant gap in literature and policy.

2.2 Work and climate change in Cambodia

Work in Cambodia’s garment sector is characterised by low wages, poor conditions, and precarious employment. In recent years, annual wages have been very low and below inflation. The minimum wage is currently \$194 per month and employment is insecure. Employers frequently keep workers on short term, fixed duration contracts (FDCs), in many cases using loopholes to allow them to do so for longer than the legally permitted time, or firing workers before they would be legally required to move onto undetermined duration contracts (UDCs). Fixed-durations contracts further discourage worker organising,²³ in a context where freedom of association and collective mobilisation are already impeded by weak and fragmented unions. Moreover, labour and trade union rights are continually eroded by reforms to labour and trade union laws.²⁴

In addition to the day-to-day economic pressures they face, garment worker livelihoods are additionally undermined by the growing urban impacts of climate change. Cambodia has in recent decades observed an increasing frequency and intensity of climate change-linked environmental impacts.²⁵ Urban flooding has become increasingly common, increasing in the Phnom Penh area by 7.2% between 1990 and 2005 and a further 14.9% between 2005 and 2020 due to a combination of climate change, rapid urban development, and the loss of wetlands and water bodies.²⁶ At the same time, rural droughts are also becoming more common due to a combination of changing rainfall patterns,^{27 28} and reduced Mekong River flow due to upstream damming.²⁹ Mekong river levels during the last decade dipped well below long term average levels,³⁰ reaching only 46% of long-term average in 2019, with huge consequences for agriculture.

21 Dieste et al., 2019: 120

22 Dieste et al., 2019: 127

23 Salmivaara, 2021

24 Lawreniuk, 2020a

25 Eckstein et al., 2020

26 Nguyen et al., 2021

27 Mekong River Commission, 2022

28 Doch et al., 2015

29 Eyler et al., 2020

30 Eyler et al., 2020

Underpinning these changes, long term temperature averages in Cambodia mirror global and regional trends. Cambodia already experiences some of the highest temperatures in the world, with an estimated national average of 64 days per year when the maximum temperature exceeds 35°C.³¹ Temperatures in Cambodia are now around 1°C higher than in 1960,³² leading the number of hot days to increase by up to 46 days per year.³³ Within factories themselves, garment worker environmental health is compromised by a lack of detailed health and safety legislation. The core of Cambodian labour legislation is still based on the 1997 labour law, which provides little detailed specification in terms of employer responsibility under climate change.

External environmental scrutiny is also limited.³⁴ Environmental impact assessments have ‘been treated as a mere requirement for initial project approval, not a tool for environmental management’.³⁵ The ILO’s international Better Work program does not include environmental indicators and corporate environmental programs have not addressed widespread infringements of international buyers’ stated sustainability policies. Indeed, as highlighted in both government documents³⁶ and academic research,³⁷ the impact of the industry on water and air quality is substantial and rapidly rising.

Cambodia is therefore a site undergoing two parallel transitions: the pursuit of labour justice by workers and the pursuit of sustainability by industry. As the accounts foregrounded in this report show, however, these two struggles are more closely related than policy on either side reflects. Industrial sustainability cannot be meaningfully achieved without integrating worker voices into sustainability planning. Fair work is a crucial part of sustainable production.

31 World Bank, 2021
32 World Bank, 2021
33 USAID, 2019
34 ILO, 2021
35 ILO, 2021:35
36 Royal Government of Cambodia, 2021
37 Parsons et al., 2021

3.0 Methodology

To explore how industrial production and sustainability transitions shape both worker vulnerability to climate change in Cambodia's garment sector, and environmental feedbacks to these transitions, we employed a multi-sited, mixed-methods research approach to capture data from garment workers and industry stakeholders along the garments value chain. The selection of sites was intended to capture an overview of vulnerability in the garment industry, by delivering the survey in four geographically distinct factory locations and three rural locations.

Eight factory sites were selected to reflect the diverse geography of the industry, with two factories selected in each of four sites: the capital city Phnom Penh; the province immediately surrounding Phnom Penh, Kandal, where the majority of the garment industry is located; the drought-prone central province of Kampong Speu, where a high proportion of rural garment factories are located; and the coastal province of Sihanoukville (Kampong Saom), the cooler coastal province located close to the main international port. Within these areas, specific factories were selected by union partners *Coalition of Cambodian Apparel Workers' Democratic Union* (CCAWDU), *Cambodian Alliance of Trade Unions* (CATU), *Cambodian Union of the Movement of Workers* (CUMW) and *Free Trade Union* (FTU), via project partners Solidarity Centre.

During the second phase of the project, the quantitative data set generated in phase 1 was analysed to identify key sender-side locations connected to the factory sites already explored, following a "tracking out" methodology developed in the course of previous research on translocal connections in Cambodia.^{38 39 40} From the dataset of 200 respondents, the three districts cited most commonly by the informants were selected as rural study sites. The sites identified were Svay, in the Eastern province of Svay Rieng; Cheik, in the central province of Kampong Speu; and Poum, in the Southwestern province of Kampot. Across the three villages, a total of 200 informants were randomly selected for the rural interview schedule, divided into 100 rural informants whose household included garment workers, and 100 informants whose household did not include garment workers. Rural informants were not selected on the basis of a specific linkages to the urban survey.

Having completed phases two and three, the fourth phase of stakeholder mapping and interviews comprised two parts. First, qualitative data were obtained from garment workers and union representatives who had already participated in the survey. Second, the key informants able to speak to the wider garment industry, including stakeholders involved in the business of the industry, industrial monitoring, government, and non-government sources.

During the final phase of the project, stakeholders were consulted during two workshops held to disseminate and reflect on results, as well as generating new data. The first of these workshops was held in Siem Reap, where 18 union leaders representing seven unions participated in a full day workshop to discuss recommendations for the industry. These now form part of the data in this report. A second preview event was held later in Phnom Penh, where results were discussed with the Ministry of Labour and other members of an invited audience.

38 Lawreniuk and Parsons, 2020

39 Lawreniuk and Parsons, 2017

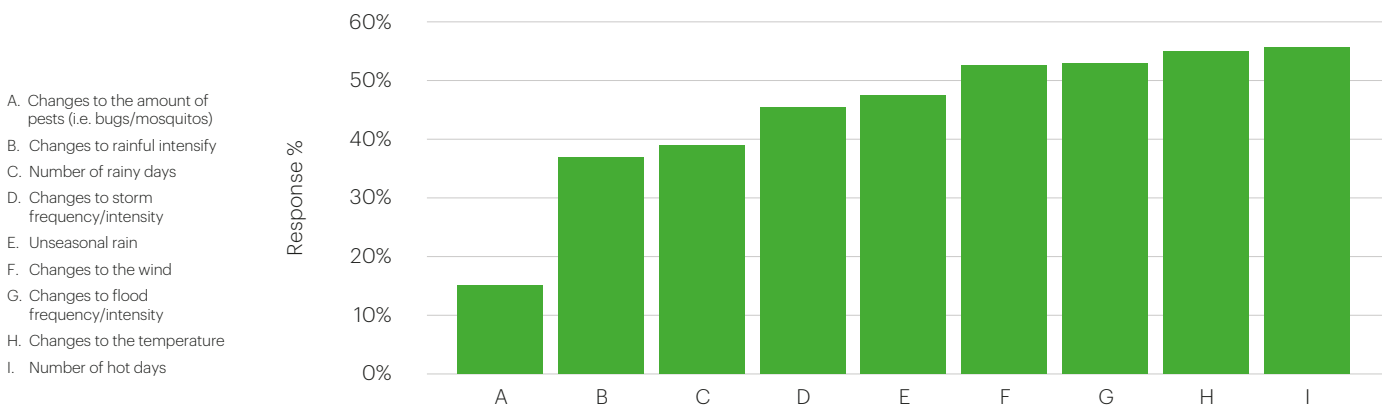
40 Parsons, 2016

4.0 Garment work under climate change

Climate change is already affecting garment workers in multiple ways. In the cities in which many live, floods are becoming more frequent: a problem that low paid migrant workers like garment workers are especially exposed to. In Phnom Penh, for example, 42% of urban poor residents are affected by flooding from polluted bodies of water,⁴¹ and 23% live near riverbanks,⁴² often in poor quality housing.⁴³ Since garments workers are amongst the most likely to live in these ‘peripheral, hazard prone areas’, where these risks are highest,⁴⁴ they are at the forefront of Cambodia’s urban vulnerability to climate change. Heat, similarly, is a major issue, with the number of very hot days increasing by 46 per year since 1960⁴⁵ and garment workers, once again, are amongst the most exposed to it. Within factories themselves, workers face dangerously high levels of heat. A recent small-scale study, for example⁴⁶ found that during hot season certain workers faced average wet bulb temperatures⁴⁷ of over 32°C, placing them in the “extreme caution” category of heat exposure, wherein severe illness such as heat cramps, heat exhaustion and heat stroke are likely with prolonged exposure.

Whilst by no means unique to the garment industry, the heightened exposure to climate change faced by garment workers makes them especially aware of the impacts of climate change. The proportion of workers experiencing climate change impacts is generally above national average.⁴⁸ Indeed, as shown in Figure 1, garment workers regularly experience a range of climate change impacts.

Figure 1. Climate change impacts experienced by garment workers in the last 10 years



Source: Just-in-time transition urban survey data, 2021.

41 STT, 2014: 31
 42 PPM, 2012: 10
 43 PIN, 2014
 44 Flower et al., 2015
 45 USAID, 2019
 46 Kinnaeth, 2019
 47 Wet bulb temperature is the lowest temperature to which air can be cooled by the evaporation of water into the air at a constant pressure. It is therefore measured by wrapping a wet wick around the bulb of a thermometer and the measured temperature corresponds to the wet bulb temperature (Razak, 2007)
 48 NCSD and MoE, 2020

More compelling still than the numbers, however, were workers own accounts of their experience. Worker testimonies repeatedly stressed the prevalence and severity of these impacts, stating that conditions ‘are getting worse. It is warmer than before and floods are more frequent’ (Bopha, union representative in a Kampong Speu Factory). Reflecting the quantitative data above, workers also stressed their attribution of these impacts to climate change, stating for example that ‘I am not sure but [I think] it is related to climate change. That is my opinion. Before, there was no rain in August and September. Now it has changed. Before, there it rained lightly. There was no flooding, but it is often flooding nowadays’ (Peakhadey, union representative in a Phnom Penh factory). As a second worker confirmed:

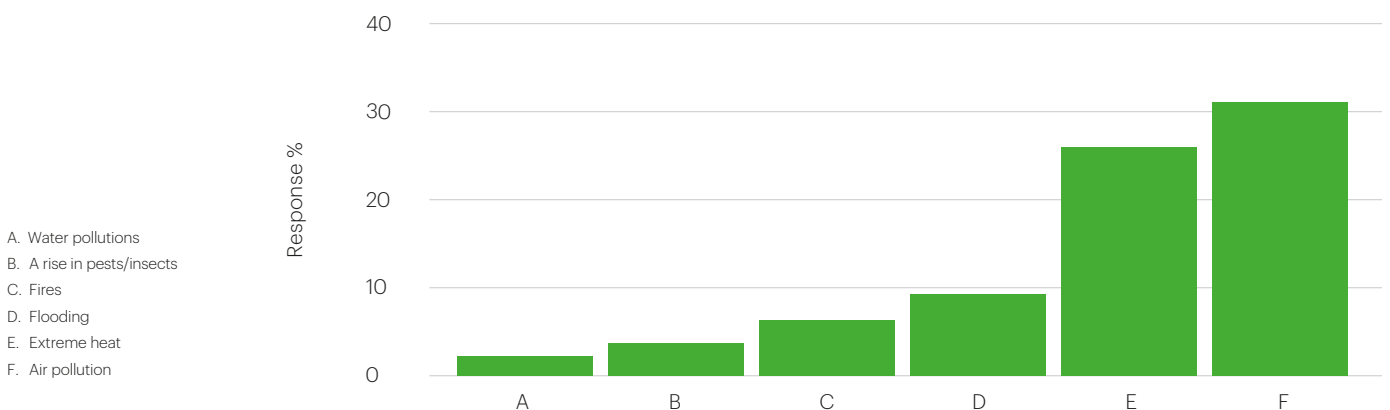
“It was not sizzling like this in the past, 10 years ago. Nowadays, it is burning from 9am. In Cambodia, we have flooding and many other things... the weather has changed dramatically. In my opinion, it is because of climate change”

Sarath, union representative in a Kandal factory

Many workers also possessed a solid grasp of the drivers of climate change, ascribing ‘so much air pollution from the factories, a lot of smoke from the generators and some people cutting down the trees’ as underlying their own experiences (Bora, union representative in a Kandal factory). Workers also suggested coherent strategies to mitigate these impacts. As one suggested: ‘in my opinion, we should [also] cut down on using gasoline and diesel. We can change to using sunlight instead. It is just my opinion [but I think] it will reduce some natural disasters’ (Dara, union representative at a Kandal factory).

As outlined in Figure 2, most garment workers (55.5%) have experienced at least one environmental impact inside the factory in the last 12 months, with the most common being air pollution at 30.5%, followed by extreme heat (25.5%), flooding (9%), fires (6%), pests (3.5%) and water pollution (2%). What follows will highlight the impacts on workers of the three most common environmental impacts experienced.

Figure 2. Environmental impacts experienced in garment factories



Source: Just-in-time transition urban survey data, 2021.

Air pollution

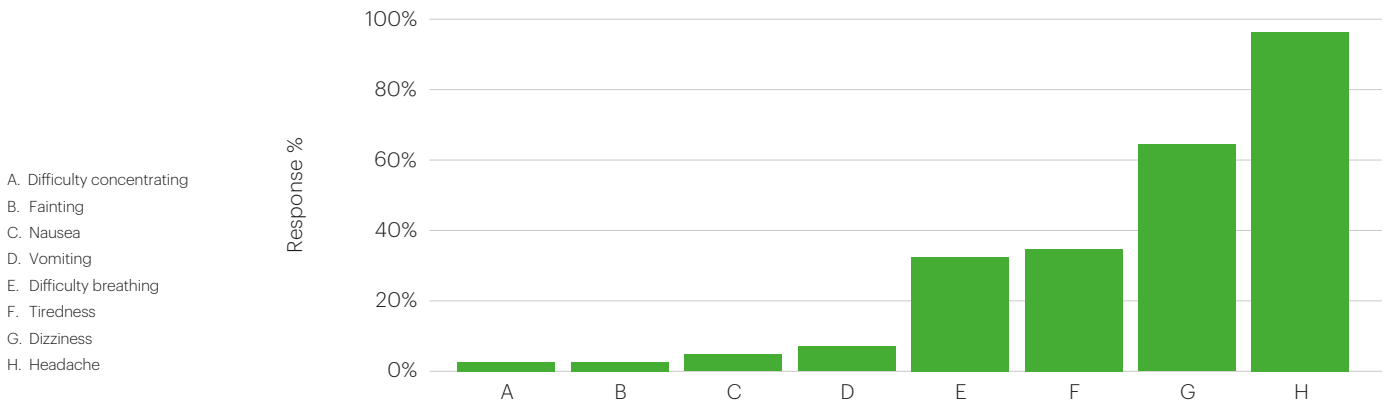
Many garment workers reported health problems from these environmental issues. As shown in Figure 3, a substantial majority (77%) of workers who experienced air pollution in the workplace – itself almost half of the population surveyed – reported becoming unwell as a result. As a pharmacist working at a clinic adjacent to multiple garment factories in the Veng Sreng district of Phnom Penh – and linked to the National Social Security Fund (NSSF) which provides free healthcare to garment workers – explained, exposure to airborne pollutants such as these, in combination with other factors, has a substantial impact on garment worker health:

“I think [the factory] can lack oxygen. So, this is the factor of them for the hard of breathing. They feel stressed. They always have a headache and when our brain lacks oxygen, we will always have a headache...”

...When they work in factories with this kind of environment for a long time, they will have a high risk of tuberculosis and pulmonary fibrosis. Since they have to breathe in chemicals day by day. It is the same with people who smoke, they will have a high risk to their lungs, with unhealthy lungs in the future. They cannot have the normal gas exchange in their lungs, so they will have the symptoms of breathlessness, feeling tired, and looking pale...”

Pisey, Pharmacist in Cham Chao, Phnom Penh

Figure 3. Symptoms reported as a result of garment factory air pollution



Source: Just-in-time transition urban survey data, 2021.

Heat

Excess heat is one of the garment industry’s most commonplace, yet dangerous environmental issues. Many workers experience health problems from heat stress so severe that they become unwell, miss days of work, or simply work well below their normal capacity. As shown in Figure 4, across the sample, 22% of workers experiencing heat stress reported that it compromised their ability to work, whilst a further 6% stated that they had missed days of work as a result of excess heat. Workers attributed the causes of excess heat in the workplace in large part to the weather itself, which they feel has become hotter and hotter in recent years. As one worker put it, ‘when the weather is hot, the environment in the factory is burning as well’ (Bopha, Union Representative in a Kampong Speu Factory).

Figure 4. Impacts of heat stress in the workplace



Source: Just-in-Time Transition urban survey data, 2021.

As a second worker explained, ‘before, the temperature was only 36 degrees Celsius. Nowadays, the weather is hotter than before. So, it affects our health. We catch a cold and feel sick most of the time’ (Peakhadey, union representative in a Phnom Penh factory). Moreover, the impact of this extreme heat has a tangible and sometimes dramatic impact on worker health. Workers complain that ‘the weather has been irregular recently. It has changed from hot to cold. I always catch a cold and have a cough nowadays. Most of the factory workers have the same issues’ (Bora, union representative in a Kandal factory). Moreover, more serious health problems still are becoming common:

“[The temperature] has changed so much. It seems like we cannot accept this change... Sometimes, [workers] pass out. A garment worker passed out since it was sizzling, and then they had a convulsion.”

Dara, union representative at a Kandal factory

These impacts were explained by a local pharmacist as follows:

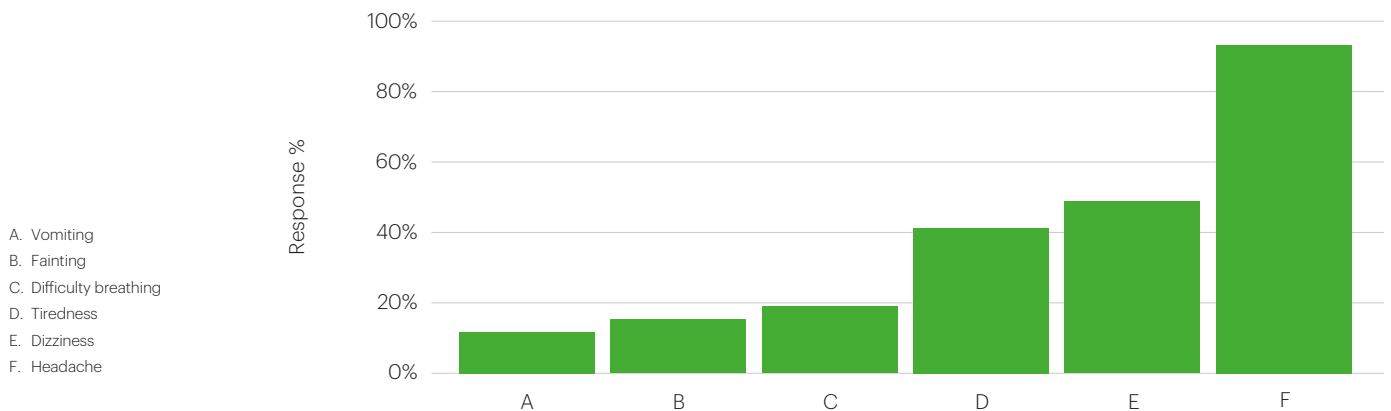
“Normally, when we are working in hot place, the amount of oxygen in the blood will be reduced. Normally, when there are low oxygen levels in your blood, it will be hard for you to breathe, and sometimes you get faint due to low blood sugar levels. Generally, workers who own an N.S.S. card go to provincial hospital for treatment.”

Veasna, pharmacist in Kampong Speu

If these figures are extrapolated to the 8.8 billion USD of exports from Cambodia in the first 10 months of 2021, this would indicate an average annual reduction in the value of goods exported of 290 million USD

Union leaders emphasized how common heat stress is now becoming in the industry. As one leader put it, ‘now we’ve got complaints from nearly every factory. It’s so hot and [workers] also get fever and faint. Also when we travel to work, it’s so hot!’ (Union Leader). Combined with the proportion of workers highlighting missed days and reduced workplace productivity as a result of heat stress, outlined in Figure 5, these data evidence the growing importance of heat as a feature of worker wellbeing and industrial output under climate change.

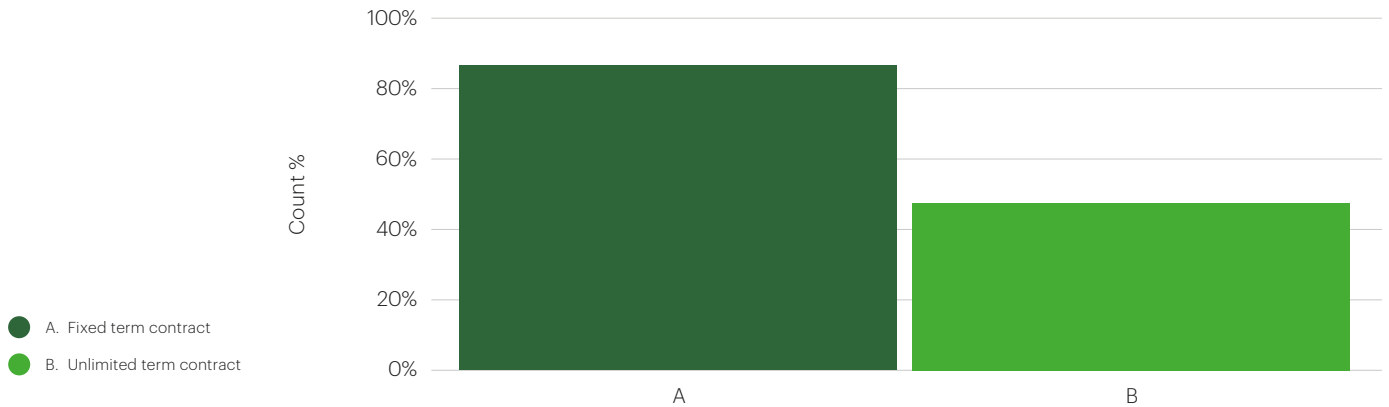
Figure 5. Health impacts of excess heat in the workplace



Source: Just-in-time transition urban survey data, 2021.

Despite the high proportion of workers reporting heat stress overall, informants did note significant variation in exposure to heat stress depending upon factory roles. In particular, ironing sections were identified as the hottest areas of the factory, as one worker explained, ‘some of the other jobs experience the effect [of heat] more than me. They are the steamer and I’m just sewing. The workers who work at the steaming station are getting hot’ (Sun and Serey, young garment worker couple in Phnom Penh).

Moreover, in addition to this variation within factory roles, an unexpected but strong relationship was found with contract status. As shown in Figure 6, 85% of workers on fixed duration contracts reported perceiving changes to the temperature, compared to only 47% of workers on unlimited duration contracts. The full rationale for this large difference is not immediately clear, but underlying geographical reasons – i.e. the location of the factory – may be ruled out due to the lack of a significant difference. On the basis of the evidence as a whole throughout the study, the difference is likely to be explained by the correlation in attitudes towards environmental and social protection measures on the part of factory management, i.e. factories with staff on unlimited contracts are likely to both be longer established and take a longer term view of investment in factory wellbeing.

Figure 6. Percentage experiencing temperature changes by contract status

Source: Just-in-time transition urban survey data, 2021.

Viewed in this way, heat stress presents in garment factories emerges as not just a physiological issue, but also an economic one, with 2% of total working hours to be lost each year by 2030, either because it is too hot to work at all or because work must continue at a slower pace.⁴⁹ Though generated via self-reporting, the data here closely mirror the findings of the ILO, with the sample of workers reporting reduced productivity generating a mean 12.5% estimation of lost output. Scaled up to the workplace as a whole, these 22% of workers reporting diminished productivity from excess heat produce an estimated 2.75% reduction in industrial output. If these figures are extrapolated to the 8.8 billion USD of exports from Cambodia in the first 10 months of 2021,⁵⁰ the latest figures available, this would indicate an average annual reduction in the value of good exported of 290 million USD.⁵¹

Flooding

As Phnom Penh becomes ever more vulnerable to flooding,⁵² workplaces – and workforces – are beginning to feel a growing risk to their operations and livelihoods. Flooding was the third most commonly experienced climate-linked impact reported by garment workers, cited by 9% of those surveyed. Many workers viewed this as an issue of increasing importance, arguing that ‘it is getting worse. It is warmer than before and floods are more frequent’ (Bopha, union representative in a Kampong Speu factory).

As with excess heat, though, the economic and physical dimensions of flooding are closely intertwined. Phnom Penh’s growing flooding problem is associated numerous health problems, including skin irritation, rashes, infections, and stomach upsets,⁵³ but the economic impacts of flooding are as, if not more, important. As shown in Figure 7, those affected in this way reported an average 36% reduction in their productivity, whilst 78% of workers in this category reported reduced wages on the days affected. For those experiencing full closure of the factory, workers reported an average 80% deduction in their earnings on those days. As outlined by one worker whose factory had recently experienced a two-week flood:

49 ILO, 2019

50 GMAC reported in Phnom Penh Post, 2021

51 Figure calculated by assuming value of exported goods to remain constant in final two months of 2021 (8.8 bn/10*12 = 10.26 bn for 2021 calendar year).

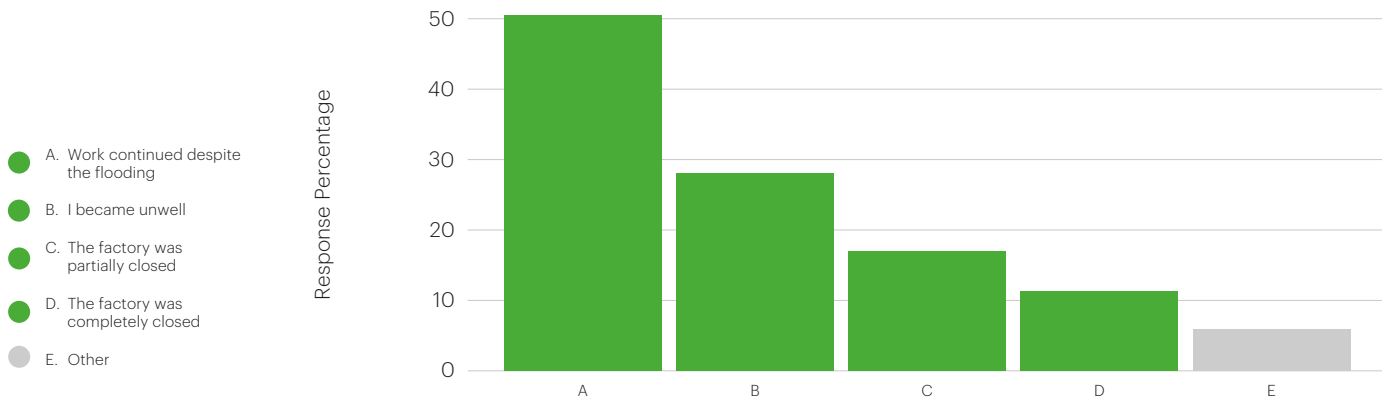
52 Nguyen et al., 2021

53 Saulnier, 2019

“It was flooding for 2 weeks. The factory announced to close the factory for 2 weeks. And I still could help the factory by moving some clothes to the other building. And then, delayed for 1 more weeks. And then, after cleaning up, we prepared our working place again. And for the salary, they gave 30% of the salary... Only 30% of the salary. They paid the workers on a daily basis. It was 1 to 2\$ per day. They gave 30% to workers who were absent during flooding.”

Pheakdey, union representative in a Phnom Penh factory

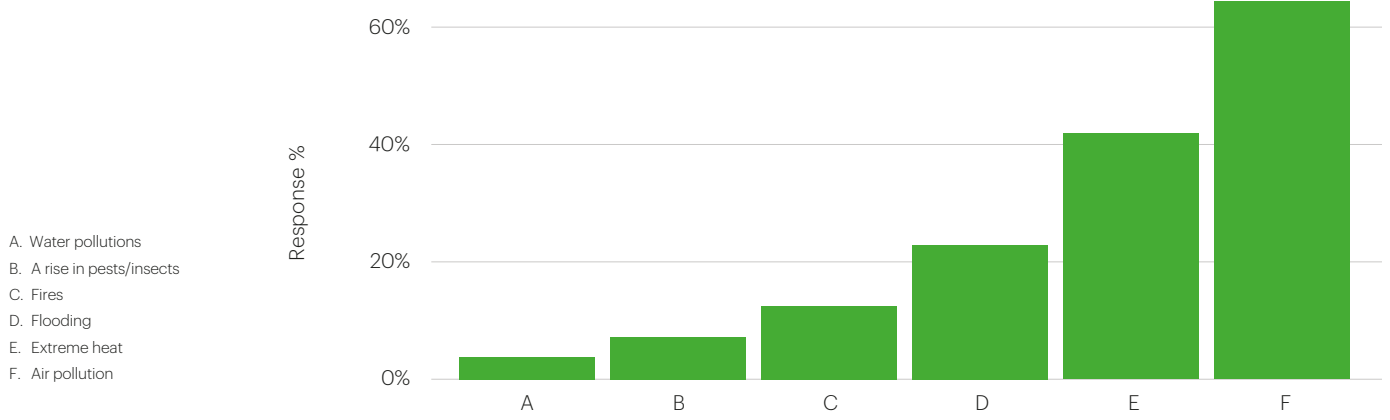
Figure 7. Workers’ experience of flooding in the factory



Source: Just-in-time transition urban survey data, 2021.

To understand the full impact of flooding, it is necessary to place garment work in its full urban context. As shown in Figure 8, the impact of flooding in worker accommodation outside of the factory was more frequent than inside the factory and had a bigger impact on workers’ health. As one worker who had recently experienced this explained, the flooding at her accommodation reached ‘my foot’s height [and] the flood smelled so badly... I had a fever. I always caught a cold and I took medicines very often’ (Srey Mom, garment worker in Phnom Penh). As well as general illness, workers reported secondary impacts, such as the increased presence of snakes in the flood water that flowed into their homes. In the words of one worker, ‘it was hard to live during the flooding... We killed some small snakes, but we still feel afraid of it. When it rains, the snakes come around’ (Bopha, union representative in a Kampong Speu factory).

Figure 8. Climate change impacts experienced by workers in their accommodation



Source: Just-in-time transition urban survey data, 2021.

There is a flood from the toilet because the sewers are filled with water during heavy rain. We stand and wait until the rain stops and the water in my room completely flows out into the sewer.

5.0 Linked rural-urban climate change impacts

Climate change is recognised as playing an increasingly significant role in both rural and urban livelihoods. Yet despite this, these two areas of work have rarely communicated. The literature on urban impacts – segregated as it has tended to be into urban disaster risk posed by floods and droughts on the one hand, and workplace climate impacts such as heat on the other – has tended to remain separate from the literature on rural impacts, focused predominantly on agriculture, and in Cambodia especially on floods and droughts.

Yet this does not reflect the intertwined realities of work in Cambodia. Workers are highly mobile, often moving between rural and urban areas multiple times and this is no less true in the garment industry, where average duration of work remains well under five years.⁵⁴ The linkages and mutual obligations that workers retain with their rural households – indeed, many continue to live with their parents – mean that rural and urban environmental risk are tightly intertwined.

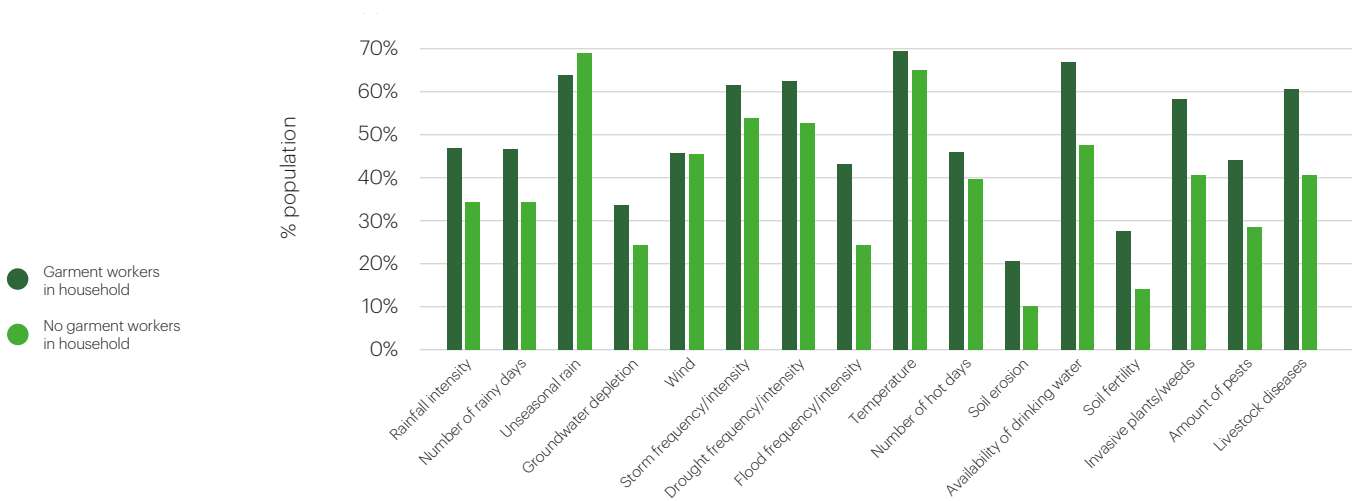
“When I was young, farming was very profitable because there was enough water. Ten years ago, seasons were regular, but now the weather has changed dramatically. Sometimes, there is less rain in rainy season. Farmers are facing a lot of trouble because of climate change.”

Garment worker, Phnom Penh

Economic and social obligations through remittance flows spreads risk across rural-urban networks, and thus spreads the impacts of climate change. Rural impacts on agricultural activities mean increased remittance payments from garment workers, heightening pressure on their livelihoods. Urban impacts, such as the economic losses incurred through excess heat or flooding, conversely result in diminished remittance payments, placing additional strain on rural livelihoods already struggling to adapt to the changing climate. As outlined in the below data, this interlinkage shapes not only adaptive capacity, but also perceptions of, and vulnerability to, climate change, generating clear distinctions between those households connected to the garment sector and those without such connections.

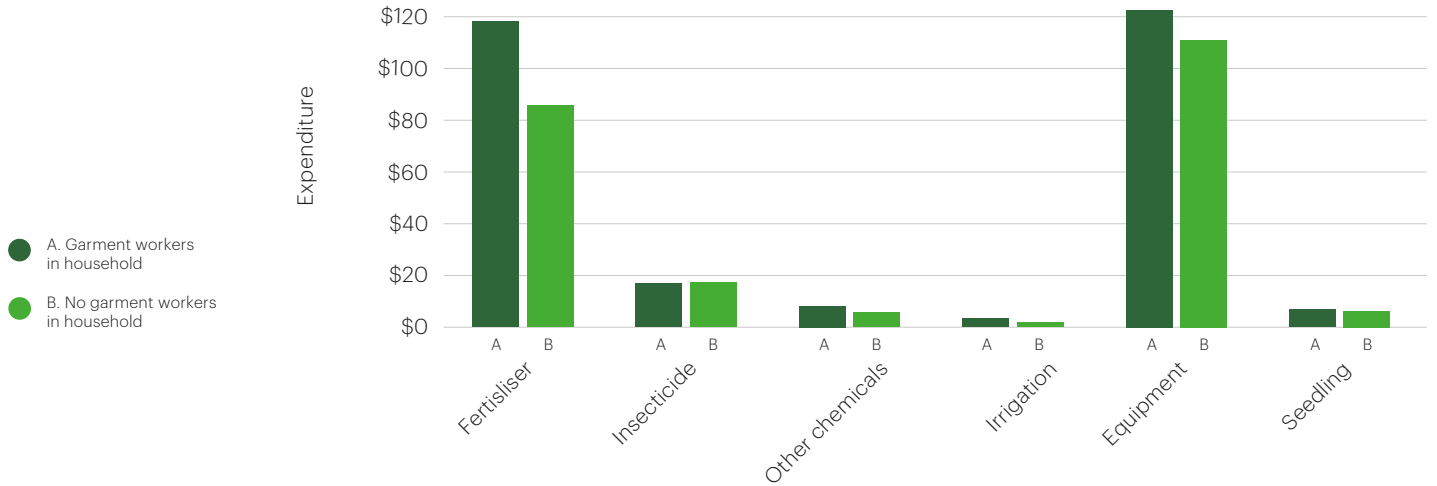
Indeed, as shown in Figure 9, the rural families of garment worker and non-garment worker households report substantially different levels of perceptions of every climate change indicator. As evidenced in the data, it may be seen that households containing garment workers are more likely than those without garment workers to perceive each type of impact in all but one case: unseasonal rain. In each of the other 15 indicators, households containing garment workers are more likely to perceive changes in the climate.

Figure 9. Perceptions of climate change impacts in households with and without garment workers



Source: Just-in-time transition rural survey data, 2022.

The reason for this difference is the crucial importance of remittance flows from the garment industry in the contemporary rural economy. Mean annual expenses on agriculture across all of the three villages is substantial. In Svay, also the village with the lowest incoming remittances, mean agricultural spend is 177 USD. In Poum, mean agricultural spend is 187 USD, whilst Cheik, the village receiving the highest average level of remittances, also evidenced the highest level of agricultural expenditure, at 396 USD. Despite the different overall levels, however, the distribution across the three villages is broadly similar, with fertiliser and agricultural equipment constituting the mainstay of costs in each case, followed by insecticide, as the third highest cost. As shown in Figure 10, many of these agricultural investments are closely connected to garment sector remittances. Households containing garment workers – and thus those that receive the regular remittances they provide – farm differently than those who do not. They spend more money on agricultural inputs on average, participating in capital-intensive agricultural practices such as chemical fertiliser use, and mechanised farming.

Figure 10. Agricultural expenditure amongst garment worker and non-garment worker households

Source: Just-in-time transition rural survey data, 2022.

The result is that rural and urban are extremely closely linked, with shocks on one side affecting household economies on the other. Garment workers report cutting back on all but the barest of necessities in order to send as much money as possible to their rural households and during periods of acute rural need, even taking on additional jobs beyond the long hours they spend in the garment factories themselves:

“[Rural pressures] affect the garment workers. When there was a drought, they had to send more money to their hometown. The garment workers have to work harder, [but they] cannot get much salary [so] they cannot support their family much at all. That’s why some garment workers have to find part-time jobs, working in a shop or any restaurant.

They work in a factory for 8 to 10 hours per day. It affects their health, [but] it is about what is needed in their family. They have no choice, so they have to work [even] harder to support their family. They are weak. They work hard at the factory and then at the beer garden. They can drink some alcohol [whilst working there] and this makes them weak. Their health conditions are not good at all. Generally, they often have a headache, so when they cannot stand it, they ask for permission for a half-day. They take some medicines [but] they have to be very patient and hardworking, to support their family in the hometown.”

Bora, union representative in a Kandal factory

Rural and urban climate impacts are thus closely interlinked. When rural shocks such as floods and droughts hit the family farm, garment worker livelihoods are squeezed further. On the other hand, when garment workers are unable to work due to climate-linked shocks such as floods or heat exhaustion, this lost income is often felt as much on the rural as the urban side of household livelihoods. As the impacts of climate change intensify, therefore, the pressures of garment worker livelihoods are being stretched in two directions simultaneously.

6.0 Just-in-time transition: structural factors shaping vulnerability to climate change in the garment industry

Speaking to workers in Cambodia's garment factories reveals how deeply embedded environmental risks are within our global systems of production. Yet it also reveals a varied landscape. Some factories are much hotter than others, some much more prone to flooding, some workers within any given factory more exposed to workplace risks and some less able to cope with them due to the scale of their rural obligations. Understanding this landscape of vulnerability means recognising that it does not emerge from individuals, but from multiple aspects of the global garment industry working in combination.

For example, a key feature of the Cambodian garment industry's vulnerability to climate change derives from the history of the industry. Unlike industries such as Ethiopia or Bangladesh, which have been purpose built to a far greater extent, Cambodia's garment industry has emerged largely ad hoc. Such regulation and oversight as currently exists has largely emerged in more recent times and is applied only partially by a combination of government departments, the factory monitoring body Better Factories Cambodia, and certain brands. The result is that many exporting factories are not structurally appropriate for the role they now undertake. As a source in Cambodia outlined:

“The buildings aren't even designed generally. As a factory, the design is a warehouse and they often have a permit as a warehouse and not factory. So, they're not even built for purpose, right? And if they're not for purpose, then you're going have issues around what they're actually designed for...”

This country, it's blisteringly hot. Maybe it's not the best place for a garment sector in this country, you know! But it happens. There's also a side thing as well, which is not a side thing: that investment into changing these factories costs a lot of money. I would imagine it's a lot of money not only to design something that works, but then the electricity bill, which would... be pretty prohibitive, I would have thought. And then what's the return on investment for, for that? Does it outweigh the actual cost that's sunk already? What I mean and I think the answer is that it's not worth it. And that people are probably more expendable than having to pay a huge sum. I think that's it. It's not good, but I think that's the reality.”

Senior representative at an industry monitoring organisation, Phnom Penh

Given the substantial work required by many factories to effectively comply with the labour law on excess heat, standards set by brands and best practice frameworks set by monitoring bodies such as better factories, this lack of a clear return on investment is a key constrain on improving standards in the industry. As an environmental program specialist for a major brand noted, this is due not to a reluctance to consider interventions, but by pressures on other aspects of the industry, which serve to crowd out environmental interventions:

'Factories are not focusing on heat because there are other things that they are focusing on... The social requirements are a lot easier for them to understand because there is a tangible impact. Workers might join a union and go on strike, which would affect productivity. Heat productivity loss, even 2.7% is seen as something minor'

Environmental representative at a major clothing brand, Phnom Penh

Further underscoring the reluctance to invest in improving the built infrastructure of the industry is the contractual flexibility and capital mobility built into the system. Factories frequently own only the machines employed in the production process, and sometimes not even those, whilst buildings themselves are rented. Significant investment in improving the built infrastructure of the industry is therefore viewed by many owners as a sunk cost, rather than a capital investment. From the perspective of the building owners, moreover, the incentive to provide an environmentally complaint factory space is superseded by the often-competing incentive to secure repeated rental contracts, as outlined by a source representing an industrial monitor:

"Most factories are rented. So, if you are thinking about where to put a factory, cause you want to attract a rent, it's different to where you might build a factory. If you want to build like an optimal factory, like your workforce. So, if you are going to build a warehouse to rent it as a factory, you're going probably put it at the side of road, which prevents them from doing those basic things."

Senior representative at an industry monitoring organisation, Phnom Penh

Moreover, undermining the incentive of factories to make concerted improvements to the conditions faced by their workforces is the relatively low capacity of the state to monitor factories, even where legal frameworks do exist. Government sources refer to their role 'as a parent workers, looking after health issues, we never don't think about our own children' (Senior Advisor, Ministry of Labour), This capacity issue is known and acknowledged by brands themselves, who note, for example that 'it's easy to say that the government should be dealing with it, but in reality, the capacity is limited' (Environmental representative at a major clothing brand, Phnom Penh). Although the Ministry of Labour itself undertakes some factory visits, it does not undertake periodic inspections, relying instead on workers to report the conditions directly to the Ministry, as outlined by a senior member of staff at the ministry:

“We often go to check out the working conditions in the factories. When we have found out any inappropriate mistakes related to the unusual temperature, we have to punish the employers. We have to advise them to change their work conditions that affect the workers. That is the first thing. We need to investigate and get enough complaints from the workers so that we will go to check out the factories directly. Some workers are not aware of this point, so we have the campaign to educate and promote their rights, duty, and other working conditions. The workers can sue and complain to the Ministry of Labour, in which case we will be responsible for it. And we will check out and survey their workplace. The workers can come directly to us. They can inform us via Telegram, Facebook and hotlines”

Senior representative, Occupational Safety and Health Department, Ministry of Labour

Nevertheless, over and above factory management or government regulators, worker testimonies consistently highlighted the capacity of brands help alleviate the environmental vulnerability they face. Many workers had grown frustrated with a perceived lack of presence and responsiveness from factories themselves, but retained faith in the capacity of brands to generate improvements in these conditions. One union rep put forward his opinion that ‘based on my observation, I see that buyers understand workers’ challenges. If it is so hot inside the factory, workers will definitely feel tired and faint. And the factory will absolutely face slow progress. That’s why the factory has to cope with the problem promptly’ (Pisey, union representative in a Kampong Speu factory). As a second worker explained, ‘I had never seen even the factory owner. But there were frequent visits of buyer’s assistant or QC (quality control). They didn’t have any obligation to talk to the workers. They just came to the factory to check the working process’ (Suni and Serey, young garment worker couple in Phnom Penh).

Senior union leaders echoed their members’ comments on the lack of responsiveness to issues raised by workers. As they ‘it’s really hot there for our workers. We have asked the employer to do something to keep the temperature down as the heat is unbearable at this point. We have asked for different types of fans. But all the requests go unheard at this point’ (Federation leader, Independent Trade Union Federation). Brand staff broadly echoed this view, but emphasised the need for a broader “coalition” of NGOs, government and the private sector, in order to achieve the sustained improvements desired by workers:

“To an extent it is our responsibility to build the capacity of the factory. We don’t only start relationships with factories that have the same environmental standards that we do. It’s easy to say that the government should be dealing with it, but in reality the capacity is limited in a developing country, so there is room for a private sector response. There is definitely room for collective action, given the size of the industry and the number of NGOs.”

Environmental representative at a major clothing brand, Phnom Penh

Supporting this perspective, union leaders echoed their support for a collective solution based around the tripartite framework of government, brands and unions. As federation leader in the Cambodian Union of the Movement of Workers [CUMW] argued, this combination is crucial to ensuring that solutions progress beyond the local interventions they have been advocating up to this point. As he put it, ‘the truth is we have not done anything collectively about climate change in the garment sector, but the union is addressing the individual campaigns of the garment workers. So personally, we’ve done a fair amount on addressing [the problem]’. As he continued:

“I think the government is important, but don’t forget the buyer as well. They are instrumental. They usually have their environmental principles. So, I think if we want to do something collectively, we need buyer involvement. They have the leverage to push for timely change. And the tripartite platform is something we should do but immediately what we can do is talk to factory and talk to buyer.”

Federation leader, Cambodian Union of the Movement of Workers

Nevertheless, despite willingness on all sides to work towards collaborative solutions, industrial monitors emphasised the structural obstacles to brand-led improvements in workers’ environmental vulnerability. Instead, industrial monitoring staff highlighted the substantial imbalance of power that exists between brands and factories and in particular, the industry-wide insecurity faced by factories in relation to global buyers. As a source from an industrial monitor argued, this presents a crucial additional disincentive for factories to make specific investments, resulting instead in factories unable to comply shutting down.

“Why would you want to be a factory owner or a factory manager? What’s the incentive? There’s no financial incentive, tiny margins. We got no, there’s no recourse in terms of bargaining power with a brand. There’s no way to: it’s 95 to 5% in terms of power imbalance. So, what are you, what are you actually going for? What, and you see this, what’s happening is that there’s consolidation of factories and a closing down of those small ones that don’t work.

If you have the systems in place and then you have consistent orders from brands, then maybe you’ve got an environment which you can look at things that will make you more attractive to brands: which strategy works better, which of the heat risk initiatives. But maybe that’s a very slow path, right?”

Senior representative at an industry monitoring organisation, Phnom Penh

Further slowing the development of environmental regulation are three linked structural factories. First, ‘a brand can be very selective in where it work in terms of interventions or CSR stuff, which sometimes means just putting band aid over a surgical wound’ (Senior representative at an industry monitoring organisation, Phnom Penh). Connected to this is the problem of ‘phoenix factories’, which illustrate the capacity of factories themselves to circumvent environmental standard and reputational problems by shutting down and later reopening, or otherwise put, ‘lo and behold it’s a brand-new factory with a new name [but] it’s the same payroll. Same’ (Senior representative at an industry monitoring organisation, Phnom Penh). Third, is the ongoing pressures placed on factories to meet order targets, over and above their compliance with environmental health standards, which incentivises both brands and factories either seeking loopholes, or pursuing optics over meaningful change. This is an issue recognised by the Ministry of Labour, who argued that:

“Regarding the brands, they have to be respectful and venerable. The brands cannot break the rules of the Ministry of Labour. The brands need to be understandable in this case. The brands must not force the factories to do illegal things. The employers need to obey the rules in the country and negotiate with the brands as well. To promote the well-being of the factory workers. When the factory workers have any problem, it can be an issue to the employers and continue to the brands. They all need to be responsible.”

Senior representative, Occupational Safety and Health Department, Ministry of Labour

Beyond these chronic structural issues, an acute impediment to industrial adaptation in the garment sector is the shock of COVID-19, which has had two major impacts on the industry. In the first instance, it has greatly reduced the operating capital available to the industry. Many factories have shut down and those that remain have recently had to shut for several months, in some cases without goods already produced being paid for by buyers.⁵⁵ Secondly, the sudden shock to the global garment supply chain enacted by COVID-19 has underscored the precarity of the arrangements within which garment factories operate,⁵⁶ further disincentivising long term investment on the part of factories themselves. Indeed, the unwillingness of factories to engage in adaptation investment in the wake of the pandemic is something highlighted by an environmental program manager at a major brand:

“This is a new one for us to consider these adaptation aspects. Heat stress and flooding are the major short term and long-term impacts on how factories operate and we are looking at how to tackle it. It a new one for us to start looking at. It can be challenging for decarbonisation, let alone future proofing... There are so many things that factories have to sort in the present moment: water efficiency, boiler efficiency, etc. So when we are talking about things that haven’t happened – that’s something that they tend to be reluctant to do... Factories are not focusing on heat because there are other things that they are focusing on.”

Environmental representative at a major clothing brand, Phnom Penh

Rather than spurring action to mitigate future climate-linked risks to production, therefore, reports from across the industry suggest that the pandemic has disincentivised investment in measures that mitigate worker vulnerability in the workplace. Notably, this is a discourse used to justify lack of investment in such measures both upwards and downwards: to brands and to workers themselves. As one union leader explained

“What I’ve seen is that it’s getting hotter, yet there is no preventative measure or accommodation for this heat and rain. Usually, the factory will say we can’t think about that because of Covid so the heat... affects their health and the health of the workers - and economically too! This is something that is the employer’s obligation. I’ve heard a lot that lately there’s no mitigation against the heat, so workers faint. If they stay home, they have to lose their wage. So that’s what requests from workers have been to us – to do something and talk to the employer.”

Federation leader

On the one hand, this discourse from factory management reflects the fact that factories have borne the brunt of industrial losses incurred throughout the COVID-19 pandemic, yet it also highlights more broadly the structure of vulnerabilities throughout the industry. Risk, of multiple types, is unevenly distributed throughout the garment industry, whilst responsibility is distributed widely, inhibiting significant investment in protective measures. Viewed from this perspective, the flexible, unintegrated, just-in-time structure of the industry as it stands presents a major barrier to effective industrial adaptation to the growing pressures of climate change. Short term, flexible industrial arrangements disincentivise long-term investment in industrial adaptation measures, leading workers to experience higher levels of exposure to the impacts of climate change. The substantially higher levels of perceived temperature change by workers on short term contracts is one immediately tangible example of this, but it overall just one part of a wide structural

55 Lawreniuk, 2020b

56 Lawreniuk, 2020b

transition towards economic arrangements that make workers more, rather than less, vulnerable to the impacts of climate change.

In the absence of a coherent body of OSH legislation, this structural incentive effectively side-lines industrial adaptation within the landscape of priorities faced by the sector. Garment workers are currently – and increasingly – vulnerable to climate change impacts and keen for investment to be increased in this area. However, whether or not factories are willing in principle to undertake this kind of investment, the need to prioritise other aspects of their environmental performance, such as energy use and waste disposal, leaves little capacity to do so. On the buyer side, the lack of strong legal regulation of OSH in Cambodia, combined with a sectoral trajectory towards supply chain flexibilization is likely to see these issues of incentive further heightened over time. Worker vulnerability to climate change in the Cambodian garment sector is therefore likely to increase along two parallel, but opposite trends: increasing risk of climatic hazards, and diminishing investment in environmental protection for workers.

7.0 Conclusion and recommendations: transitioning from mitigation to adaptation in the garment and footwear industry

Recommendation 1. Incorporating worker voices into industrial climate change and sustainability planning

As outlined in the Paris Climate Agreement, worker voices must be central to action on climate change. This is set out explicitly in the following clause, which outlines that industrial and development strategy must place workers and worker priorities centrally within its planning:

“Taking into account the imperatives of a Just Transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities.”

Paris Agreement (2015)

To implement the Paris Agreement, therefore, governments must ensure that employment-related aspects of climate policies are part of their decarbonisation and economic diversification pathways. This requires the establishment of formal social dialogue mechanisms so that just transition strategies can be designed at all levels – community, region, company and sector, and country. These formal mechanisms should build on and learn from existing local, regional and sectoral initiatives. In Cambodia, this should include the creation of country- and sector-level tripartite forums, as well as the inclusion of climate policies in enterprise-level collective bargaining and agreements.

In addition, it must involve workers in the development of national environmental and regulatory frameworks and the necessary monitoring and enforcement to encourage transformative investment in long-term environmental sustainability.⁵⁷ Transformative environmental policy addresses on-going processes of societal change and utilizes them for achieving environmental sustainability. It assumes that governments react slowly to societal change and that there is a need for the development, support and innovation that have the most potential of redirecting societal trends towards sustainability.⁵⁸ Workers should play a key role in developing this.

57

ILO, 2021a

58

Schot and Steinmueller, 2018

Finally, the evidence of this report suggests that the concept of a just transition requires further expansion to incorporate a stronger emphasis on industrial adaptation. This will mean greater dialogue with policy and scholarship on decent work under climate change, whilst also incorporating those aspects of Occupational Safety and Health which are likely to become more challenging. Strengthening this dialogue between sustainability planning and OSH will be key to improving work in a warmer world.

Recommendation 2. Adapting to rising temperatures

Cambodia has experienced a rise in mean annual temperature of over 0.8°C since 1960. Current projections suggest an acceleration of this trend in the future, indicating that temperatures across the country will rise by 0.7-2.7°C by 2060 and 1.4-4.3°C by 2090. Irrespective of the success of efforts to mitigate further change, the effects of the existing increase are already exhibiting significant impact among the workers in the garment and footwear industry. A rise in the average number of hot days, observed by more than half of the sample (55%), is shown here to be the most significant climate change impact perceived by the sector's workforce. This is keenly felt foremost within the factory environment, where 26% of the surveyed garment sector workforce report extreme heat as a workplace impact of the changing climate.

Levels of heat within the factory are noted as a cause for concern among industry stakeholders more widely. Each year in its annual reports, Better Factories Cambodia, which audits and reviews labour standards through independent factory inspections, records excessive workplace temperatures as among the most common points of non-compliance with labour standards across a broad range of categories. In 2018, for example, the last year that data were recorded before a hiatus during the COVID-19 pandemic, 65% of factories were found to have unacceptable temperatures at the time of workplace inspections.⁵⁹ The level of non-compliance has remained roughly constant over previous rounds of reporting (cf. 71% in 2017 and 69% in 2016), indicating a lack of progress on this stubborn issue despite widespread acknowledgment of the problem.

The Cambodia Climate Change Strategic Plan (CCCSP) now recognises that “adaptation activities currently neglect the importance of heat stress on labour productivity”,⁶⁰ including in industry. However, as shown here, heat stress is also having notable impacts on worker's welfare and health. Whilst 22% of respondents in our study reported that extreme heat has impacted their ability to work, a greater share at 53% observed its impacts as illness or injury. Exposure to heat in the workplace has been long associated with a range of specific conditions, from the more severe heat stroke and heat exhaustion, to milder conditions like heat cramps and heat rash. The symptoms described by respondents, from headaches (reported by 98% of those experiencing extreme heat) and dizziness (48%), to vomiting (11%) and fainting (15%), indicate that some proportion of workers endure conditions on the more serious and complex end of the spectrum of heat exposure disorders (HSE 2013).

59 BFC, 2018

60 MEF, 2018

This demands urgent action for a heat illness protection program in the garment and footwear industry to guarantee workplace health and safety. Recommended actions to remove or reduce the sources of heat include:⁶¹

- **Control the temperature** by trialling engineering solutions such as building materials that reduce exposure to radiant heat or cooling devices like fans and air-conditioning.
- **Regulate the length of exposure** to hot environments by modifying work schedules to respond to temperature variability and include periodic rests.
- **Prevent dehydration** by providing cool water and encouraging workers to regularly drink before, during and after work.
- **Provide training** workers on the risks of heat stress associated with their work, including symptoms of heat illness, safe working practices, and emergency procedures.
- **Identify employees who are more susceptible to heat stress** through individual risk assessments, taking account of illnesses, conditions, or medications that heighten risk of heat stress.
- **Monitor the health of workers** who remain at residual risk despite control measures.

Although most of the expenditure on this will come from the private sector, the government also has an important role. Cambodia's garment sector is dominated by the "cut-make-trim" segment of the garment value chain, where the share of value added to the final output is relatively low. Factories in low-value added segments of the garment value chain operate on low profit margins, have short-term business horizons, and as such are incentivised to minimise investment. For example, two thirds of all factories in Cambodia are leased and not owned by the occupier.⁶² This creates a disincentive to invest in the necessary remedies for excessive heat, from improved engineering solutions to occupation health and human resources development. Given this, there is a need for regulatory measures by the government that establish minimum standards for heat protection, which may be incorporated into monitoring during buyer auditing and the Better Factories Cambodia program.

Recommendation 3. Building urban disaster risk resilience

Cambodia is considered one of the most disaster-prone countries in South-East Asia.⁶³ The country is regularly hit by natural disasters, especially floods and droughts, which are becoming increasingly frequent due to climate change. Although much of the focus of disaster risk reduction efforts to date focus on the manifestation and impacts of disasters in rural or agricultural locations and populations within the country, the data here show that these are being observed and felt in urban locations too. Among the surveyed sample of workers, 9% of workers had experienced flooding at their workplace and 20% had experienced flooding at their accommodation.

61 Adapted from HSE, 2013
62 GGGI, 2021
63 UNDRR, 2019

Garment workers are vulnerable to urban disaster risks because they often live in low-cost rented accommodation within peripheral, hazard-prone areas of cities or provincial towns, close to factories which must remain in locations within permitted bounds for industrial use. There is still no official building code in Cambodia⁶⁴ and many low-cost rented accommodation options are of low quality, typically found single room blocks with internal or external shared bathroom facilities. Poor quality housing, high population density, and lack of adequate water, hygiene and sanitation infrastructure – including absent or poorly maintained and serviced municipal systems for water, sewage, drainage, and household waste collection – exacerbate the vulnerability of low-income groups in already hazard-prone areas.⁶⁵ These systems often fail during episodes of urban flooding, creating contaminated waters, which carry increased risk of disease. Owing to this, as shown here, the health impacts of flooding are the most commonly experienced impacts of flooding at residential accommodation, reported by 38% of workers experiencing this type of climate impact.

The findings of the report therefore lend to recent calls for a renewed focus within disaster risk response programs in Cambodia on supporting low-income urban residents and communities to build resilience to disaster risk to protect the health and safety of workers at home as well as in the workplace. Recommended actions to build resilience to disaster risk in Cambodia include:⁶⁶

- **Mainstream DRR into holistic urban planning strategies** by integrating comprehensive, DRR-orientated planning regulations, including zoning and building codes, into urban master plans for permitted development.
- **Extend drainage and flood protection infrastructure to peri-urban areas** by investing to upgrade drainage and other core infrastructure, such as paved, raised roads, piped water, and flood defences.

In this case, the recommendations here target national and municipal authorities, however industry stakeholders must also play a role in ensuring that workers do not incur damages in the form of health problems or income losses from urban disaster occurrence. Where punitive leave-of-absence and punctuality policies fail to acknowledge the urban risk of disaster, they compel workers to sacrifice wellbeing to attend work or suffer income penalties. Improved human resource policies that afford workers empathy and flexibility are therefore necessary to ensure that workers do not risk illness or injury and retain an adequate level of income in times of crisis.

Recommendation 4. Enhancing climate resilience in rural communities

Approximately 70% of Cambodian households derive a significant proportion of their income from agriculture.⁶⁷ The majority of agricultural production is dependent on natural cycles, including the monsoon rain and the annual flooding and recession of the Tonle Sap Lake, which are being impacted by climate change.⁶⁸ The data here show that these impacts are keenly perceived by rural communities, where knowledge of climate change is much higher than in urban communities, where 94% of rural inhabitants compared to 67% of our factory worker sample were familiar with the term and concept.

64 Habitat for Humanity, 2021
65 Flower and Fortnum, 2015
66 Adapted from Flower and Fortnum, 2015
67 UNDP, 2015:1
68 Seiff, 2022

Climate change is therefore causing a significant impact on the livelihoods and welfare of rural Cambodians. It is reshaping rural identities and patterns of work, as “repeated environmental shocks and stresses over recent decades has contributed to a process of rural–urban migration, as smallholder farmers are compelled forced to find nonfarm work to sustain their livelihoods under changing conditions”. As Cambodia’s largest formal sector employer, the garment sector is an important destination for rural-urban migrants.

Such migration is “well established”⁶⁹ as a form of climate change adaptation in the literature, where remittance flows from the garment industry are crucial to the agricultural expenditures that now underpin the rural economy. As this study illustrates, however, the demands from rural households to subsidise ongoing farm production exert considerable financial pressure on the garment sector’s workforce and increase further at times of acute crisis. For workers, this means cutting back on the already fine margins of urban expenditure, as cost to personal health, security and wellbeing. As this report argues, therefore, the role of the garment industry as an adaptive pathway for rural households vulnerable to climate change is therefore complex, as workers are effectively sacrificing their own urban adaptation to fund rural adaptation, via remittances.

The findings of this report therefore redouble the importance of strengthening the resilience of local communities to the impacts of climate change on agriculture, as a means of protecting the welfare and wellbeing of both urban and rural communities alike. Recommended actions to enhance the resilience of rural communities to climate change include:

- **Improve social protection for marginalised groups** who are often particularly vulnerable to climate change and may have little recourse to alternative livelihoods. Reducing the reliance of elderly populations on subsistence or cash-crop production to self-finance old-age income and health care, for example, would relieve some of the burden on garment industry workers to continue to subsidise extended household farm production.

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