

Adapting to the impacts of extreme heat on Bangladesh's labour force

Annex:

1. References

2. Overview of existing policies

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1. References

- Bach AJE, Palutikof JP, Tonmoy FN, Smallcombe JW, Rutherford S, Joarder AR, Hossain M, Jay O (2023) Retrofitting passive cooling strategies to combat heat stress in the face of climate change: A case study of a ready-made garment factory in Dhaka, Bangladesh. *Energy and Buildings*, 286, 112954. [DOI: 10.1016/J.ENBUILD.2023.112954]
- Burkart K, Breitner S, Schneider A, Khan MMH, Krämer A, Endlicher W (2014) An analysis of heat effects in different subpopulations of Bangladesh. *International Journal of Biometeorology*, 58, 227–237. [DOI: 10.1007/s00484-013-0668-5]
- Chowdhury S, Hamada Y, Ahmed KS (2017) Prediction and comparison of monthly indoor heat stress (WBGT and PHS) for RMG production spaces in Dhaka, Bangladesh. *Sustainable Cities and Society*, 29, 41–57. [DOI: 10.1016/j.scs.2016.11.012]
- Dasgupta S, van Maanen N, Gosling SN, Piontek F, Otto C, Schleussner CF (2021) Effects of climate change on combined labour productivity and supply: an empirical, multi-model study. *The Lancet Planetary Health*, 5(7), e455–e465. [DOI: 10.1016/S2542-5196(21)00170-4]
- Day E, Fankhauser S, Kingsmill N, Costa H, Mavrogianni A (2018) Upholding labour productivity under climate change: an assessment of adaptation options. *Climate Policy*, 19(3), 367–385. [DOI: 10.1080/14693062.2018.1517640]
- Diffenbaugh NS, Burke M (2019) Global warming has increased global economic inequality. *Proceedings of the National Academy of Sciences of the United States of America*, 116(20), 9808–9813. [URL: <https://www.pnas.org/doi/abs/10.1073/pnas.1816020116>]
- FAO (2016) The role of mechanization in agricultural sustainability. [URL: <https://www.fao.org/sustainability/news/detail/en/c/460221/>]
- Guttikunda SK, Khaliquzzaman M (2014) Health benefits of adapting cleaner brick manufacturing technologies in Dhaka, Bangladesh. *Air Quality, Atmosphere and Health*, 7, 103–112. [DOI: 10.1007/s11869-013-0213-z]
- Hossain SS, Delin H, Mingying M (2022) Aftermath of climate change on Bangladesh economy: an analysis of the dynamic computable general equilibrium model. *Journal of Water and Climate Change*, 13(7), 2597–2609. [DOI: 10.2166/wcc.2022.412]
- International Labour Organization (2022, March 22) Child Labour: Bangladesh ratifies the Minimum Age Convention. [URL: https://www.ilo.org/global/standards/subjects-covered-by-international-labour-standards/child-labour/WCMS_840125/lang--en/index.htm]
- International Trade Union Confederation (ITUC) (2022) 2022 ITUC Global Rights Index. [URL: https://files.mutualcdn.com/ituc/files/2022-ITUC-Rights-Index-Exec-Summ-EN_2022-08-10-062736.pdf]
- Jaren LS, Leya RS, Mondal MS (2022) Investigation of Gender-Differentiated Impacts of Water Poverty on Different Livelihood Groups in Peri-Urban Areas around Dhaka, Bangladesh. *Water* 2022, Vol. 14, Page 1167, 14(7), 1167. [DOI: 10.3390/W14071167]
- Kahn ME, Mohaddes K, Ng RN, Pesaran MH, Raissi M, Yang JC (2021) Long-term macroeconomic effects of climate change: A cross-country analysis. *Energy Economics*, 104, 105624. [DOI: 10.1016/j.eneco.2021.105624]
- Kapsos S (2008) The gender wage gap in Bangladesh Regional Office for Asia and the Pacific. [URL: https://www.ilo.org/asia/publications/WCMS_098063/lang--en/index.ht]
- Kjellstrom T, Briggs D, Freyberg C, Lemke B, Otto M, Hyatt O (2016) Heat, Human Performance, and Occupational Health: A Key Issue for the Assessment of Global Climate Change Impacts. *Annual Review of Public Health*, 37, 97–112. [DOI: 10.1146/annurev-publhealth-032315-021740]

- Kompas T, Pham VH, Che TN (2018) The effects of climate change on GDP by country and the global economic gains from complying with the Paris Climate Accord. *Earth's Future*, 6, 1153–1173. [DOI: 10.1029/2018EF000922]
- Liu MY, Shamdasani Y, Taraz V (2021) Climate Change and Labor Reallocation: Evidence from Six Decades of the Indian Census. *SSRN Electronic Journal*. [DOI: 10.2139/SSRN.3905985]
- Mahmud F (2023, June 8) Bangladesh suffers long power cuts amid worst heatwave in decades. *Al Jazeera*. [URL: <https://www.aljazeera.com/news/2023/6/8/bangladesh-suffers-long-power-cuts-amid-worst-heatwave-in-decades>]
- Rahman MM, Ali MR, Oliver MMH, Hanif MA, Uddin MZ, Tamim-UI-Hasan, Saha KK, Islam H, Moniruzzaman M (2021) Farm mechanization in Bangladesh: A review of the status, roles, policy, and potentials. *Journal of Agriculture and Food Research*, 6, 100225. [DOI: 10.1016/J.JAFR.2021.100225]
- Reza AK, Islam S, Shimu AA (2017) Green Industry in Bangladesh: An Overview Article in Environmental Management and Sustainable Development. *Environmental Management and Sustainable Development*, 6(2), 124–143. [DOI: 10.5296/emsd.v6i2.11027]
- Simpson C, Hosking JS, Mitchell D, Betts RA, Shuckburgh E (2021) Regional disparities and seasonal differences in climate risk to rice labour. *Environmental Research Letters*, 16(12), 124004. [DOI: 10.1088/1748-9326/AC3288]
- The World Bank (2022, October 6) Bangladesh Overview: Development news, research, data. [URL: <https://www.worldbank.org/en/country/bangladesh/overview>]
- The World Bank (2023) World Development Indicators [Data set]. [URL: <https://databank.worldbank.org/reports.aspx?source=World-Development-Indicators#>]
- Think Hazard (n.d.) Bangladesh – Extreme Heat. Retrieved March 31, 2023, from [URL: <https://thinkhazard.org/en/report/23-bangladesh/EH>]
- Titumir RAM (2021) Numbers and Narratives in Bangladesh's Economic Development. Singapore: Palgrave Macmillan. [DOI: 10.1007/978-981-16-0658-8]
- United Nations Industrial Development Organization (n.d.) Green Industry Initiative. [URL: <https://www.unido.org/our-focus-cross-cutting-services-green-industry/green-industry-initiative>]
- Uddin ASMS, Khan N, Islam ARM, Kamruzzaman M, Shahid S (2022) Changes in urbanization and urban heat island effect in Dhaka city. *Theoretical and Applied Climatology*, 147, 891–907. [DOI: 10.1007/s00704-021-03872-x]
- Wolf MJ, Emerson JW, Esty DC, de Sherbinin A, Wending ZA, et al. (2022) 2022 Environmental Performance Index. New Haven, CT: Yale Centre for Environmental Law & Policy.
- World Health Organization (2014) Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s. *World Health Organization*. [URL: <https://apps.who.int/iris/handle/10665/134014>]
- World Health Organization (2022) Sanitation. [URL: <https://www.who.int/news-room/fact-sheets/detail/sanitation>]
- Zhao M, Lee JKW, Kjellstrom T, Cai W (2021) Assessment of the economic impact of heat-related labor productivity loss: a systematic review. *Climatic Change*, 167, 22. [DOI: 10.1007/s10584-021-03160-7]

2. Overview of existing policies

Policy or plan	Year	Aim and activities
International Labour Organization (ILO) Conventions	1972, 1998, 2001, 2022	Bangladesh joined the ILO in 1972. It has ratified 8 out of 10 core conventions have, including legally binding standards on forced labour, the right to organise, discrimination, and child labour.
Bangladesh Labour Act (BLA)	2006 Amended in 2013 and 2018	<p>The Act replaced 25 existing Acts and has a broad coverage. It aims to introduce standards of labour rights in the recruitment process and labour-employer relationships, and it sets standards for minimum wages, wage payments, health, safety, occupational hazards, youth employment, maternity benefits, working hours, wages and payments, trade unions, working conditions etc.</p> <p>The first amendment in 2013 was passed after the collapse of the Rana Plaza complex, which brought safety and health issues to the fore.</p> <p>Both amendments contained an expansion of labour rights to move more towards International Labour Standards.</p> <p><i>Criticisms and unintended consequences:</i> The Labour Act has been criticised for not covering the informal sector and for failing to include some employees, particularly mid-level managers. It is also criticised for not promoting gender integration sufficiently and for not addressing sexual harassment in the workplace.</p> <p>The 2013 amendment was criticised by the ILO for falling short on several issues they had called for, particularly concerning the freedom of association.</p>
Bangladesh Labour Rules	2015 Amended in 2022	<p>Mandatory rules were introduced to enforce the implementation of the Labour Act. The amendment contained additional measures, e.g. on empowering trade unions and preventing sexual harassment at work.</p> <p><i>Criticisms and unintended consequences:</i> The aim of enforcing the Labour Act has not been achieved in several areas. E.g. it outlaws threatening or dismissing a worker for joining, wanting to join or persuading others to join a trade union but this is poorly enforced and there are widespread reports of harassment, threats, and people losing their jobs due to joining or attempting to form a trade union. Almost half of all union registration applications get rejected by the Department of Labour and union meetings are frequently banned by the police.</p> <p>The 2022 amendment has been criticised for largely ignoring the recommendations that had been called for by worker representatives and labour leaders.</p>
Labour Policy	1980 Latest update in 2012	The aim of the policy is to ensure a healthy, productive, non-discriminatory, and non-exploitative work environment for all. It provides a framework for labour rights and welfare, and decent work, and it determines minimum wages.

National Child Labour Elimination Policy	2010	<p>This policy was introduced with the goal of eliminating risky child labour by 2021 and all other types of child labour by 2025.</p> <p><i>Criticisms and unintended consequences:</i> This policy is an important step but it has not been effective in reducing the number of working children in Bangladesh. According to the ILO, the number of working children aged between 5 and 11 increased by 16.8 million from 2016 to 2020 (ILO, 2022). One of the main challenges is the implementation of the policy in the informal sector, where the majority of working children are employed.</p>
National Occupational Safety and Health (OSH) Policy	2013	<p>The policy was adopted to ensure a safe and healthy working environment. Next to protecting workers, the aim was also to help increase industrial productivity. The policy applies to formal as well as informal sectors of the economy.</p> <p><i>Criticisms and unintended consequences:</i> The implementation of OSH standards is not sufficient in many areas. There are widespread reports of inadequate sanitation and water services in factories, which is particularly affecting the health of women in the garment sector. Accidents in the workplace are also frequent, especially in the construction and transport industries. The committees introduced to enforce workplace safety have been criticised for being largely powerless.</p>
Health National Adaptation Plan (HNAP)	2018	<p>This plan aims to provide guidance towards building resilience to the impacts of climate change on health. One of the key components of the plan is health of the workforce with a focus on strengthening the health system and promoting collaboration between health and other sectors.</p>
National Adaptation Programme of Action (NAPA)	2005 Updated 2009	<p>The NAPA was prepared following the COP7 UN climate conference. It attempts to incorporate responses to climate change into the overall objectives and development plans of Bangladesh. It identifies loss of life from increased heat stress as one of the main vulnerabilities.</p> <p><i>Criticisms and unintended consequences:</i> The programme was criticised by stakeholders for insufficiently addressing the impacts of climate change. As a result it was updated in 2009, building on new findings on climate impacts and vulnerabilities, but is seen by some to be too focused on international policy and financial incentives rather than domestic political will. Furthermore, the project-based approach fails to address adaptation comprehensively.</p>
Bangladesh Climate Change Strategy and Action Plan (BCCSAP)	2008 Updated 2009	<p>In support of the Bali Action Plan of COP13, this strategy to coordinate activities addressing climate change was designed. The BCCSAP includes programmes based on six pillars of intervention: food security, social protection, and health; comprehensive disaster management; infrastructure such as coastal and river embankments; research and knowledge management; mitigation; capacity building and institutional strengthening.</p> <p><i>Criticisms and unintended consequences:</i> The plan is said to lack people's engagement and participation and critics who found that the implementation of the proposed</p>

		actions were not successful called for a new plan to address climate change.
National Adaptation Plan of Bangladesh (NAP)	2023–2050	<p>The NAP is designed to comprehensively address climate change and it includes recommendations for regional and local level solutions as well as national strategies on adaptation actions. The main aim is to reduce vulnerability to the impacts of climate change and to protect the most marginalised communities. Extreme heat waves are identified as a major threat especially to urban areas and the loss of productivity is mentioned as one of the consequences. Eco-engineering and bioengineering measures, climate-resilient construction materials, expanding green and blue infrastructure, and renewable energy-based utility facilities are proposed as possible adaptation measures.</p> <p><i>Criticisms and unintended consequences:</i> The implementation of the NAP faces several challenges such as ineffective coordination, lack of transparency, and lack of capacity among government institutions. Furthermore, the planned adaptation actions require large investments, which need to come from the government as well as from the international community. The ability to access global funds and the effective use of secured funds remains a further challenge for Bangladesh.</p>
Nationally Determined Contribution of Bangladesh (NDC)	2015 Updated 2021	<p>The initial NDC was submitted to the UNFCCC in 2015 for the power, industry and transport sectors. The NDC proposed 12 million tons (5%) unconditional greenhouse gas reduction from business as usual by 2030 and 24 million tons (10%) conditional reduction with international support. An Action Plan to implement was prepared in 2018. The updated NDC, submitted in 2021, calls for further mitigation actions to limit emissions. Since some adaptation actions also benefit mitigation, Bangladesh’s NDC also includes adaptation priorities.</p> <p><i>Criticisms and unintended consequences:</i> Bangladesh’s NDC relies on natural gas as the main energy source to transition away from the more emissions-intensive sources of oil and coal. Using gas as a ‘bridge fuel’ allows Bangladesh to cut down emissions to some degree while maintaining economic growth. However, this has been criticised as being inconsistent with the Paris Agreement. Expanding renewable energy production would enable a greater reduction in emissions but would require vast investments in the grid system. A further criticism concerns the failure of the NDC to address loss and damage sufficiently. Considering the rising costs of climate hazards, Bangladesh’s response to climate change could be more effective by integrating loss and damage into its strategy.</p>