Climate Change Impacts on the RMG, Leather, Leathergoods and Footwear Sectors

Implications for Workers and Industry with Pathways to a Just Transition

Mondiaal FNV
Bangladesh Labour Foundation

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Disclaimer

Preface

Climate change is no longer a distant concern rather it is a present and growing challenge that is already affecting industries, workers, and communities across Bangladesh. Among the most affected are the Ready-Made Garment (RMG) and Leather sectors, which are key contributors to the national economy and major sources of employment, particularly for women and internal climate migrants. These industries are highly vulnerable to environmental stress, yet there is still limited understanding of how climate change is impacting workers' health, safety, and livelihoods.

In this context, the study titled *"Climate Change Impacts on the RMG, Leather, Leathergoods and Footwear Sectors: Implications for Workers and Industry with Pathways to a Just Transition"* was carried out by the Department of Public Health and Informatics at Jahangirnagar University, Bangladesh. The project was supported by the Bangladesh Labour Foundation (BLF), to generate evidence to support climate-responsive planning that protects both workers and industries.

The main objectives of the study were: (a) to assess the current environmental, health, economic and social impacts of climate change on RMG and Leather sector workers; (b) to identify the challenges and opportunities that arise for workers, communities, and employers; (c) to examine the level of readiness of factories and stakeholders to adopt sustainable and climate-resilient practices; and (d) to provide recommendations for designing a worker-centered Just Transition Framework.

To meet these objectives, the present study applied a mixed-methods approach. Quantitative data were collected through surveys from 700 workers across Dhaka, Gazipur, Savar, and Hemayetpur regions in Bangladesh. Additionally, in-depth qualitative insights were gathered from 44 Key Informant Interviews (KIIs), 7 Focus Group Discussions (FGDs), and 8 worker case stories. The research involved diverse participants, including workers, factory managers, trade union leaders, government officials, civil society representatives, business association personnel, and technical experts.

This report is intended to inform government ministries, industry associations, brands, trade unions, civil society organizations, and development partners on how to better support workers in adapting to climate challenges while ensuring social justice and inclusive growth. It highlights the urgent need for cooperation among all stakeholders to develop effective policies, build institutional capacity, and promote fair, green, and sustainable industrial development. By contributing to the national and global discourse on Just Transition, this study aligns with the broader goals of the Sustainable Development Agenda, particularly SDGs 3 (Good Health and Well-being), 5 (Gender Equality), 8 (Decent Work and Economic Growth), 10 (Reduced Inequalities), and 13 (Climate Action).

With Thanks

AKM Ashraf Uddin
Executive Director, BLF

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Our heartfelt thanks go to the workers and communities who generously shared their time, experiences, and insights through surveys, focus group discussions, interviews, and case stories. Their voices are central to this report, and we deeply value their trust and cooperation. We also extend sincere thanks to the factory owners and management teams who opened their facilities and supported the research process. The support of representatives from BGMEA, BKMEA, BTA, BFLLFEA, and other business associations greatly helped in capturing industry perspectives.

We are particularly grateful to the field researchers, data enumerators, and field supervisors, whose dedication and hard work under challenging field conditions made this research possible. We also acknowledge the support of government officials, trade union leaders, and civil society experts who participated in key informant interviews and shared important insights.

Finally, we appreciate the contributions of our project associates (Afsana Yasmin, Sanjida Ahmed & Rakib Hossain), research assistants (Saikat Reza & Md. Naeem Islam), data analysts, transcribers, editors, and reviewers (M M Makfur Hassan, Shah Sakib Sadman Pranto & Nusrat Binte Nasir) for their professionalism and commitment in completing this report to the highest standard.

This study is the result of a collective effort, and we humbly acknowledge every individual and institution whose support and contributions have shaped it. We hope the findings will serve as a useful resource for driving meaningful changes and ensuring a fair and inclusive transition for workers in the face of climate change.

Research Team

Jahangirnagar University, September 2025

Fact Sheet

Climate Change Impacts on the RMG, Leather, Leathergoods and Footwear Sectors: Implications for Workers and Industry with Pathways to a Just Transition

Direct and indirect impacts of climate change | Understanding of climate change and Just Transition | Preparedness against climate vulnerability | Barriers to green transition and policy recommendations

700 F2F | 44 KIIs | 07 FGDs | 08 CSs | 400 F2F | 150 F2F | 150 F2F

Findings

Average **monthly income is BDT 13,208** (only BDT 17,780 with overtime), which leads to over **60% of households facing severe financial strain** directly linked to **climate disruptions**

52.1% of workers spend **BDT 200–999/month** on **illness-related costs**

91.5% of workers are internal migrants, with **10.3% reporting climate-driven displacement**. A further **38%** believe climate change increases their **risk of future displacement**

1 in 3 facing **stress or anxiety** linked to **financial strain and job loss fear**

82.7% of workers face increased cost of living due to climate change, contributing to significant **wage/income loss (43.7%)**

Over **1 in 4** workers deliberately **reduces water consumption** to avoid unsafe toilets

Nearly 1 in 5 workers supports a large family (≥6 members), with **94.2%** of migrants **living in overcrowded or poorly ventilated rooms**

1 in 4 female workers faces **menstrual irregularities** linked to heat and chemical exposure

82.1% of workers experience **heat stress**, leading to **48.6%** **suffering chronic headaches** from **heat, dehydration, and poor ventilation**

Barriers to Green Transition

About **24.1%** of workers **feel job insecurity** due to climate change, peaking in the Leather (**35.3%**) and Footwear (**32%**)

Lack of alternative job opportunities (64.3%); Low wages (49.3%); Lack of skills and training for green jobs (47.5%); Poor enforcement of labour laws (43.6%), and Inadequate government support (37%)

39.7% of workers report having **no social protection benefits** at all. Only **10.5%** have **health insurance** and a mere **2.5%** are entitled to **injury compensation**

60% of workers believe **climate change affects their productivity.** The highest overall disruption reported is increased **absenteeism (39.9%)**

77.7% of factories adopted heat-stress mitigation, 56.2% of factories have some form of flood protection, material reuse remains limited (16.9%), and 13.3% have adopted renewable energy

Priorities

Higher wages (74%) | Reskilling (88.2%) | Health insurance (62.7%) | Better cooling & ventilation (74%)

Demand for stronger labour rights (49%) | Entrepreneurship or alternative livelihoods (71.3%)

Key Recommendations

- Strengthen monitoring and compliance by DIFE, and develop a sectoral climate transition roadmap
- Promote reskilling and alternative employment opportunities for climate and automation displacement
- Invest in climate-resilient infrastructure and promote sustainable and green production practices
- Ensure ethical sourcing and responsible purchasing practices, adhering to the HRDD framework
- Expand social protection coverage and establish universal health insurance for all workers
- Facilitate multi-stakeholder dialogue platforms to shape inclusive and evidence-based policy development

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List Of Abbreviation

9001 QMS	9001 Quality Management System
AC	Air Conditioner
BCCSAP	Bangladesh Climate Change Strategy and Action Plan
BDT	Bangladeshi Taka
BEPZA	Bangladesh Export Processing Zones Authority
BEZA	Bangladesh Economic Zones Authority
BFLLFEA	Bangladesh Finished Leather, Leathergoods and Footwear Exporters Association
BGMEA	Bangladesh Garment Manufacturers and Exporters Association
BKMEA	Bangladesh Knitwear Manufacturers and Exporters Association
BLF	Bangladesh Labour Foundation
BSCIC	Bangladesh Small and Cottage Industries Corporation
BTA	Bangladesh Tanners Association
CCP	Competency-based Certification Program
CETP	Central Effluent Treatment Plant
CSO	Civil Society Organization
DIFE	Department of Inspection for Factories and Establishments
DNCC	Dhaka North City Corporation
DoE	Department of Environment
EPZ	Export Processing Zone
ETP	Effluent Treatment Plant
FGD	Focus Group Discussion
FY	Fiscal Year
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIZ	German Corporation for International Cooperation
GoB	Government of Bangladesh
HSC	Higher Secondary Certificate
ILO	International Labour Organization
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
KII	Key Informant Interview
LEED	Leadership in Energy and Environmental Design
LWG	Leather Working Group
MoCom	Ministry of Commerce
MoEFCC	Ministry of Environment, Forest and Climate Change
MoFEA	Ministry of Finance & Economic Affairs
MoInd	Ministry of Industries
MoJT	Ministry of Jute and Textiles
MoLE	Ministry of Labour and Employment
NAP	National Adaptation Plan

NDC	Nationally Determined Contributions
NEAP	National Early Action Protocol
NGOs	Non-Governmental Organizations
NSDA	National Skills Development Authority
OSHE	Occupational Safety, Health and Environment
PPE	Personal Protective Equipment
RISDA	Rural Integrated Services for Development and Advancement
RMG	Ready-Made Garment
RSC	Ready-Made Garment Sustainability Council
SPSS	Statistical Package for the Social Sciences
SSC	Secondary School Certificate
SSI	Semi-Structured Interview
STIs	Sexually Transmitted Infections
SUSNEX	Sustainability Nexus
SWD	Social Welfare Department
Tannery	Leather
TWU	Tannery Workers Union
UTI	Urinary Tract Infection
WASH	Water, Sanitation, and Hygiene

Glossary

Adaptation (Climate Adaptation): Adjustments and taking action in human and industrial systems to reduce harm from climate impacts, such as disaster preparedness and resilient infrastructure.

Carbon Tax: A tax levied on the carbon emissions from producing goods and services, aimed at encouraging industries to reduce fossil fuel use and adopt cleaner energy practices. It is also counted as social cost.

Circular Economy: An economic model that minimizes waste and maximizes resource use through recycling, reuse, and sustainable production processes. For RMG and Leather, this involves reusing fabric scraps, recycling wastewater, adopting eco-friendly tanning methods, and designing garments or footwear for longer durability to reduce waste and pollution.

Circular Textiles: A system within the garment sector that focuses on recycling fabric, reusing materials, and designing garments for durability and waste reduction. In Bangladesh, this means turning garment waste (jhut) into new yarn and fabrics, extending the life cycle of materials, and reducing dependence on imported raw cotton or hides.

Climate Change: Long-term (30 years interval) alteration of Earth's weather patterns, particularly shifts in temperature, rainfall, wind, and weather extremes, largely driven by human activities such as burning fossil fuels, deforestation, and industrial processes. For RMG and Leather industries, climate change manifests through rising temperatures, increased flooding, raw material disruptions, and higher energy costs, all of which affect worker productivity, occupational health, and industry competitiveness.

Climate Stress: The physical, mental, social, or economic pressure that people, communities, or systems experience as a result of the impacts of climate change

Climate Vulnerability: The degree to which a system, community, or worker is exposed, sensitive, and unable to cope with the adverse effects of climate change.

Climate-Resilient: The ability to prepare for, cope with, and recover from the impacts of climate change in a way that reduces damage and helps communities, systems, or industries continue to function.

Effluent Treatment Plant (ETP): A system designed to treat industrial wastewater, removing pollutants before discharge, essential in tanneries and textile factories for environmental compliance.

Central Effluent Treatment Plant (CETP): A Common Effluent Treatment Plant that treats wastewater from multiple industrial units or factories.

Energy Efficient Tools: Any device, machine, or equipment designed to perform its function while using less energy compared to standard or conventional alternatives.

Green Jobs: Jobs that contribute to environmental protection, such as preserving the natural environment, restoring ecosystems, reducing waste, and conserving natural resources.

Heat Index: Measures how hot it truly feels to the human body by combining the actual air temperature with the relative humidity. It is also known as 'feels like'.

Heat Stress: Includes a series of conditions where the body is under stress from overheating. Within RMG factories, heat stress is caused by poor ventilation, high-density workspaces, and rising external temperatures; in Leather factories, it is compounded by chemical exposure and humidity, reducing productivity and increasing health risks for workers.

Just Transition: The process of shifting to a low-carbon economy in a way that is fair and inclusive for all people, ensuring that vulnerable groups are protected, supported and no one should be left behind during a transition.

Migrant Worker (Climate Induced Migrant): Workers relocating from climate-affected areas to industrial hubs due to displacement, poverty, or environmental disasters. Workers who have moved from climate-affected coastal or riverbank regions to Dhaka, Gazipur, Savar, or Hemayetpur for jobs in RMG and Leather factories, often facing insecure housing, low wages, and high vulnerability due to displacement.

Mitigation (Climate Mitigation): Actions to reduce greenhouse gas emissions, including energy efficiency, renewable energy, and pollution control in industries which can affect Climate Change.

Occupational Exposure: The contact workers have with hazardous agents (chemicals, heat, dust, or pollutants) in the workplace, which may cause short- or long-term health effects.

Occupational Health and Safety (OSH): Protection and promotion of workers' physical, mental, and social well-being, with emphasis on risks linked to climate change such as heat, pollution, and chemical exposure.

Ready-Made Garment (RMG): Bangladesh's largest industrial sector, employing millions mostly women and contributing significantly to exports and GDP, but highly vulnerable to climate and market shocks.

Reproductive Health: State of well-being related to reproductive processes, with female workers facing risks like infections and maternal complications under poor workplace and climatic conditions.

Resilience (Worker/Industry Resilience): The ability of workers, communities, and industries to withstand and recover from climate shocks while sustaining livelihoods and productivity.

Social Protection: Social protection refers to public policies and programs that prevent and protect people from poverty, vulnerability, and social exclusion across their life cycles, offering income support, health care, and social services. In this report's context, social protection refers to workplace health benefits, maternity care, accident insurance, and unemployment safety nets for RMG and Leather workers who are disproportionately affected by climate shocks and economic disruptions.

Tripartite Social Dialogue: Dialogue among government, employers, and workers to develop fair labour, climate, and industrial policies. In Bangladesh, this means structured collaboration between the Ministry of Labour and Employment, employers' associations (i.e., BGMEA, BKMEA, BTA, BFLLFEA, LFMEAB), and trade unions to jointly address climate adaptation, occupational health, and worker rights in these industries.

Executive Summary

Bangladesh's RMG, Leather, Leathergoods and Footwear sectors are pivotal to the national economy, driving Gross Domestic Product (GDP) and export earnings, and providing employment for millions, particularly women. However, these sectors face escalating vulnerability due to the impacts of climate change, including rising temperatures, increased flooding, and extreme weather events. Such risks severely disrupt industrial productivity, compromise supply chains, and endanger workers' health. Women, in particular, face additional reproductive health challenges. This vulnerability is compounded by the dual burden of environmental pollution, outdated technologies, and poor infrastructure, which expose workers to occupational hazards such as heat stress, respiratory diseases, and toxic chemical exposure.

Keywords: RMG, Leather, Leathergoods and Footwear, Climate Vulnerability, Climate-Induced Migration, Industry Readiness, Sustainability Measures, Just Transition

Despite their economic significance, research on climate impacts across these industries remains fragmented. Crucially, it often fails to explore the interconnected dimensions of climate resilience, occupational health, gender equity, and socio-economic security. The concept of a Just Transition which mandates an inclusive and fair shift towards low-carbon, climate-resilient industrialization but remains significantly underexplored. Against this backdrop, this study critically examines the effects of climate change on the RMG, Leather, Leathergoods, and Footwear sectors through a rigorous mixed-methods approach. It highlights challenges and opportunities for businesses, communities, and workers. By generating evidence-based insights, the study aims to inform policies and practices that promote climate resilience, safeguard worker well-being, and advance pathways for a Just Transition, thereby ensuring long-term sustainability, inclusivity, and industrial competitiveness.

Methodology

This study employed a pragmatist, mixed-method approach to examine the multidimensional impacts of climate change. Data were collected between April and June 2025 across key industrial zones, including Ashulia, Savar, and Gazipur. The primary data sources included a structured survey of 700 workers, complemented by 44 Key Informant Interviews (KIIs), 7 Focus Group Discussions (FGDs), and 8 case stories. This design facilitated the triangulation of quantitative analysis (conducted using SPSS) with rich qualitative insights, ensuring a robust evidence base regarding worker vulnerability and industrial readiness. The research strictly adhered to rigorous ethical standards, ensuring informed consent and confidentiality.

Demographic Profile

The analysis reveals a predominantly young and economically fragile workforce, with an average age of 25.1 years. While the overall gender distribution is nearly balanced, RMG remains heavily female dominated, contrasting with the overwhelmingly male Leather sector. A high dependency burden is noted, with 80.7% of workers married and a fifth supporting large households (≥6 members), amplifying financial pressures. Educational attainment is low, with only 10.5% achieving higher secondary or equivalent qualifications. The average monthly wage is modest (BDT 13,208, rising to BDT 17,780 with overtime), while leather workers earn the least despite facing higher risks, pointing to systemic inequities. Geographic concentration in flood-prone and polluted industrial zones such as Savar, Gazipur, Ashulia, and Hemayetpur further compounds the climate and health vulnerabilities for these workers.

Working Information and Conditions

The working conditions of RMG, Leather, Leathergoods and Footwear workers in Bangladesh reveal systemic overwork, sectoral disparities, and heightened climate vulnerability. In RMG, most workers (59.3%) are concentrated in sewing, an intensive role prone to heat stress and musculoskeletal strain, while Leather production is diversified, with 38% in finishing and 15.3% in tanning, where high heat and exposure to toxic chemicals are common. On the other hand, Footwear roles focus on sewing (44.7%), lasting (17.3%), and cutting (14.7%), involving prolonged standing in poor indoor conditions.

Workforce stability varies, with RMG showing high turnover (47.5% with ≤3 years' experience), while Leather (82% with ≥2 years) and Footwear (76.7% with ≥3 years) demonstrate greater retention due to technical skills. Working time patterns underscore systemic exploitation: nearly half of all workers (49.2%) work 9–11 hours daily, and 25.5% exceed 11 hours. RMG is most affected during peak seasons, while 30% of Leather workers endure 12+ hours. Only a quarter comply with the legal 8-hour limit. Weekly rest is equally uneven; while most report a six-day week, over half in Leather (53.3%) work all seven days, denying recovery time and compounding fatigue.

These patterns demonstrate how excessive hours, lack of rest, chemical exposure, and high turnover not only violate labour standards but also magnify workers' vulnerability to climate induced stressors such as heat, poor air quality, and physical exhaustion.

Climate-induced Migration Status

Bangladesh's high climate vulnerability, driven by floods, cyclones, river erosion, and rising heat, is intensifying climate-induced migration from rural to urban and industrial zones, with profound implications for the export sectors. An estimated 91.5% of workers are internal migrants, while only 10.3% reported climate-driven displacement including RMG (10.8%), Leather (6.6%), Leathergoods and Footwear (12.6%), originating mainly from northern and coastal districts such as Rangpur, Mymensingh, and Noakhali. Migration exacerbates exposure to hazardous working conditions, overcrowded housing, and inadequate social protection. In terms of post-migration, workers struggle with finding stable employment, low wages, poor housing, social isolation, discrimination, and health risks from combined occupational hazards and environmental stress. They also face multiple barriers, including ineligibility for government incentives due to non-permanent residence, communication barriers, social isolation leading to mental health issues, and a housing crisis with higher living costs than their hometowns.

These vulnerabilities are compounded by large household responsibilities, limited savings, and reliance on precarious incomes, reinforcing cycles of economic insecurity and climate risk. Despite minimal wages, larger household sizes (19.7% with ≥6 members) mean workers struggle to survive. Women and other marginalised groups are disproportionately affected, experiencing heightened exposure to heat stress, unsafe conditions, and reduced social mobility.

The systemic gaps in housing, social support, and labour protections leave migrant workers highly susceptible to exploitation and climate shocks. This highlights the urgent need for targeted Just Transition policies, inclusive urban planning, and worker-centric climate adaptation measures.

Climate-Induced Disruptions to Livelihoods and Well-Being

Climate-induced disruptions are reshaping the livelihoods, well-being, and resilience of workers across all sectors. Climate-driven migration which is triggered by floods, cyclones, salinity intrusion, and erosion, often results in insecure housing, limited sanitation, and weak social networks, amplifying vulnerability to heat stress and occupational hazards. Over 60% of households report severe financial strain due to climate shocks where RMG workers experience financial burden (84%), with 48.3% in debt. Leather workers face economic strain (78.7%), alongside health challenges (60%). Over 80% of Footwear workers endure wage cuts (82%), increased medical costs (82.2%), and rising living costs (83.3%).

Sectoral disparities exist in housing and essential services as such housing quality is lowest in the Leather sector, with 12.7% living in tin sheds and 42% in semi-pucca homes. Safe drinking water access ranges from 68% in Leather to 90% in RMG and Footwear, with 46% of Leather workers relying on tube wells vulnerable to arsenic. The availability of safe water sources is further reduced during natural calamities.

On the other hand, sanitation is uneven; only 18.7% of Leather workers have access to sewer-connected toilets. Job security is threatened by climate-related wage cuts, unpaid leave, and production disruptions affecting 35.3% of Leather, 32% of Footwear, and 17% of RMG workers. These findings underscore the urgent need for climate-resilient housing and infrastructure, equitable social protection, and targeted interventions to support migrant, low-income, and female workers, enabling a just and adaptive transition.

Climate-Induced Disruptions to Productivity

Climate change is increasingly disrupting working conditions and productivity across the all sectors. Extreme heat, poor ventilation, waterlogging, and chemical exposure are the primary stressors, affecting health, absenteeism, and income. Approximately 82.1% of all workers report significant heat stress. RMG (87%), Leather (79.3%), and Footwear (72%) are particularly affected due to dense or chemically intensive workspaces. Only about half of all workplaces report adequate, yet often inefficient, cooling or ventilation. Chemical exposure is intensified under high temperatures, impacting over 50% of Leather and Footwear workers.

Overall, 60% of workers perceive climate change as reducing productivity. Footwear reports the highest impact (64%), followed by RMG (58.3%) and Leather (39.3%). Rigid targets and heat-induced fatigue reduce output, elevate medical costs, and compromise worker livelihoods.

Sector-specific disruptions highlight the varying vulnerabilities of each industry. In the RMG sector, absenteeism (37%), production delays (23.5%), and heat-related wage impacts (26.25%) are widespread, especially in sewing sections. In Leather sector, workers face challenges from climate-sensitive raw material supply chains (64.2% report quality declines and 62.7% supply delays), along with high absenteeism (43.3%) and workflow disruptions, amplified by waterlogging in 52% of factories. In Leathergoods and Footwear sector, workers experience the highest efficiency losses (89.2%), absenteeism (44.1%), and heat-related illnesses (41.9%), with reduced working hours (29%) further undermining output. These findings demonstrate that climate change threatens both immediate productivity and long-term industry viability, underscoring the urgent need for climate-resilient infrastructure, adaptive work practices, and sector-specific interventions.

Climate-Induced Impacts on Workers' Health

The study concludes that climate change is driving a severe and multidimensional health crisis for workers in all sectors. Escalating heat, unsafe workplaces, and weak occupational health systems have left workers vulnerable to physical, mental, and reproductive health risks, while imposing heavy financial burdens.

It is found that about 53.4% of all workers report excessive heat stress or fatigue, while 36% of them suffer dizziness or dehydration, and 2.3% have experienced heatstroke. In this case, Leather workers face the highest dehydration (66.7%) due to insufficient water intake and RMG workers report the broadest range of symptoms (73.3% feel unwell due to heat).

Regarding occupational and chronic illnesses, about 48.6% of all workers report chronic headaches, 40% of leather workers suffer skin diseases, and 31.3% report respiratory problems linked to toxic chemical exposure. In addition to this, mental health impacts are widespread, affecting over 55% of all workers. Footwear workers are the most severely affected, with 58.7% reporting mental health issues and 86.8% citing stress and anxiety linked to job insecurity.

Vulnerabilities among women workers are also alarming which identified that 26.4% of the women workers face menstrual irregularities with 10.6–19% report miscarriage risks, and up to 14.3% of leather workers suffer from infertility due to combined heat and chemical exposure.

Health service access and sanitation are deeply unequal. While 88.5% of RMG workplaces report having health facilities, only 23% of leather workplaces do. Unsafe sanitation further compounds risk: 40% of leather workers, 23.8% of RMG workers, and 21.3% of footwear workers deliberately restrict water intake to avoid unhygienic or distant toilets, heightening risks of dehydration and heatstroke.

The financial toll is heavy. Two-thirds (66%) of workers spend at least BDT 500 per month on healthcare (30–50% of their net income), with nearly one-third (29.3%) of leather workers spending more than BDT 3,000 per month, forcing debt and food insecurity. Formal sick leave, while available to 85.7%, is often unused due to fears of wage loss or production pressures.

These findings confirm that climate change is a profound threat to occupational health, gender equality, and social justice. They call for urgent investment in climate-resilient workplace adaptation, stronger occupational safety enforcement, improved health and sanitation access, gender-responsive health protections, and a Just Transition framework.

Perspectives on Climate Change and Just Transition

The study highlights that climate change is already shaping the daily realities of workers, though awareness and mitigation action remain low. Initial awareness of the Just Transition concept is low (fewer than 20% of workers). However, once explained, 82% view it as a hopeful pathway to safer jobs, fair wages, and new skill development opportunities. Regarding stakeholder perception, Trade Unions show moderate awareness; with 60% workers identify climate change as weakening labour rights, and 68% of them see a Just Transition as a tool to strengthen worker protections. Employers recognise climate risks through productivity losses (57%), but only 40% see greener practices as beneficial, while government actors display high policy awareness (70%+) but weak enforcement (35%). On the other hand, Civil Society Organisations emerge as the most informed; and they frame climate change as a justice issue (85%), and focus promoting a Just Transition as a rights-based approach (78%).

Climate-related vulnerabilities are eroding workers' health, incomes, and security. Yet, a Just Transition offers structured pathways to adaptation through reskilling, worker participation, social protection, and green innovation. Examples such as solar energy adoption, eco-friendly vegetable tanning, and environmental certifications (e.g., LWG) demonstrate how targeted measures can link global standards with local resilience.

The study emphasises that workers are not passive victims but active stakeholders ready to engage in sustainable practices if institutional and policy support exists. Building a Just Transition framework in Bangladesh requires expanding green skills, strengthening labour rights, ensuring workplace adaptation, broadening social protection, and scaling green financing.

Industry Readiness against Climate Change

The readiness of Bangladesh's RMG, Leather, Leathergoods and Footwear sectors to confront climate change is uneven, marked by partial progress but significant structural gaps. Nationally, fewer than one in four factories comply with international sustainability standards, and only one-third operate effective waste management systems. Material reuse is limited (16.9%), and chemical reduction in leather production is negligible (3.3%).

From the sectoral view, RMG shows relatively better progress while 47.3% of the workers reported that factories have waste management systems and 34.3% reporting compliance with standards. Footwear demonstrates stronger uptake of solar and eco-machinery (37.3% and 36% respectively) but weak water management. Leather remains the most vulnerable, with 44.7% of factories reporting no pollution-reduction measures and widespread dependence on outdated practices.

Climate-resilient measures are concentrated in immediate, low-cost responses. Nationally, 77.7% of factories report heat-stress mitigation, but only 13.3% use renewable energy, and just 20% have functional water management despite recurrent floods. RMG leads on flood protection (76%) and structural reinforcement (77%), leather on building safety (85.3%) but lags in renewable energy (7.3%), while footwear is strongest in heat mitigation and ventilation (92%) each with moderate solar adoption (37.3%).

Worker governance structures show disparity, for instance, safety committees exist in 89.5% of RMG and 85% of Footwear factories but with limited climate integration. Management attitudes reinforce these divides as such only 36.5% of factory leaders nationally show readiness, with the lowest readiness in Leather (24.7%), moderate in RMG (34.8%), and highest in footwear (52.7%).

Social protection is the weakest pillar of industry readiness. About 39.7% of workers reported having no social protection benefits at all. Regarding sector-specific benefits, RMG is the highest in the health insurance (13.4%), pension plans (9.4%), disability benefits (10.7%) and maternity benefits (47.8%). While Leather sector is the slightly higher in the injury benefits with 5.6% but Leathergoods and Footwear is higher in the health insurance (6.7%), pension plans (3.8%) compared to leather sector. Out-of-pocket health expenses consume 30–50% of monthly wages, pushing families into debt and food insecurity, with women disproportionately harmed due to poor maternity and reproductive protections.

Sectoral Resilience Initiatives and Uneven Progress

RMG demonstrates the most advanced uptake, leveraging green finance schemes (e.g., Green Transformation Fund, PaCT programme) to achieve significant resource efficiency (e.g., 15 billion litres of water saved in 200+ factories). Adoption includes process optimisation, waste reduction, and renewable energy pilots, such as solar rooftops demonstrating substantial CO_2 savings. Worker-focused measures, including the Employment Injury Scheme pilot and internal heat stress mitigation protocols, are also being trialled, alongside the adoption of global standards (Higg FEM) and sustainable sourcing targets.

The Leather sector shows progress through centralised infrastructure (the Savar CETP), the emergence of individual Effluent Treatment Plants (ETPs), and increasing environmental certifications (LWG, ISO 14001). Innovation is visible in water recycling and zero-waste initiatives. The Leathergoods and Footwear sector is strengthening alignment with global compliance, with over 100 Small and Medium Enterprises (SMEs) adopting Sustainable Consumption and Production (SCP) practices, which has correlated with a reduction in medical leave. Investment in eco-packaging, recycled materials, and circular economy pilots signals an early transition toward low-carbon production.

However, the efficacy of these initiatives is limited by their concentration: advanced measures and global certifications (LEED, LWG) are disproportionately adopted by large, export-oriented factories, failing to reach the numerous small and informal units where the majority of vulnerable workers are employed.

Policy Ambition Versus Implementation Reality

Bangladesh possesses an extensive and ambitious national climate policy framework, reflecting its vulnerability and global leadership. Key instruments include the Bangladesh Climate Change Strategy and Action Plan (BCCSAP, 2009), the National Adaptation Plan (NAP, 2023–2050), and the Mujib Climate Prosperity Plan (MCPP, 2022–2041), supported by other frameworks such as the Nationally Determined Contributions (NDCs).

Despite this comprehensive architecture, the reality of implementation is visibly constrained. Significant gaps persist in institutional coordination, financing mechanisms, and local-level capacity. Crucially, while the policy landscape is forward-looking, workers are the most affected and vulnerable groups are not explicitly highlighted or integrated into policy formulation or decision-making processes.

Without immediately addressing these structural barriers, the well-designed policies risk remaining aspirational rather than delivering tangible resilience or ensuring a just and equitable transition. Strengthening institutional coordination, scaling renewable energy, improving social protection, and fundamentally embedding worker participation in climate governance are critical prerequisites for advancing the Just Transition and ensuring the long-term competitiveness of Bangladesh's export sectors.

Preparations for Just Transition Pathways

The findings reveal that workers are acutely aware of the risks posed by industrial transformation and articulate clear priorities for a fair transition. In general, workers mainly demanded for higher wages (74%), health insurance (57.3%), safer workplaces (57.3%), and job security (53.1%), reflecting everyday struggles with climate-induced income shocks and occupational hazards. While re-skilling (88.2%) emerges as the single most important safeguard, underscoring that workers view new skills as a survival strategy against displacement from automation, decarbonisation, and supply chain restructuring.

Highlighting the sectoral priorities, RMG workers emphasise job security (71.5%) and alternative livelihoods, expecting support from brands and the government, and Leather workers prioritise health needs, including chemical safety, health insurance (61.3%), and safer workplaces (67.3%). While Footwear workers are the most insecure, with 95.2% demanding re-skilling, reflecting fears of severe climate-driven job loss.

Regarding stakeholder roles in just transition, workers highlighted that employers (78.4%) are the primary duty-bearers over wages and conditions; Government (57.3%) is expected to provide financial aid and safety nets; and Brands (44.3%) are held responsible for reparative measures, particularly health insurance.

Evidence shows that workers are active stakeholders with clear expectations. However, weak institutional support and fragmented responsibilities leave them structurally disempowered. Addressing these demands requires embedding livelihood security, health protection, and re-skilling programmes at the core of industrial climate strategies to ensure a transition that is not only green but also socially just and worker-centred.

Challenges in Just Transition Pathways

The study reveals significant cross-sectoral barriers to transitioning toward green jobs in the RMG, Leather, Leathergoods and Footwear sectors. The most critical constraint is the lack of alternative job opportunities that is reported by 62.5% of RMG, 65.3% of Leather, and 68% of Footwear workers, underscoring the absence of pathways for workers to shift into sustainable livelihoods.

Financial insecurity compounds this, with low wages constraining workers' capacity to absorb transition risks. Furthermore, weak enforcement of labour laws and employer resistance to change highlight structural governance deficits. Skills and training deficits are a central barrier, particularly acute in Leather (61.3%) and Footwear (53.3%), reflecting workers' limited preparedness for green industrial shifts. Government support for climate adaptation is also perceived as inadequate across all sectors.

From the sectoral nuances, it is identified that RMG faces entrenched labour law weaknesses, while Leather is the most constrained by governance failures, employer unwillingness, and wage insecurity. On the other hand, Footwear is most affected by job scarcity, skills deficits, and weak institutional support.

These trends highlight deep labour market vulnerabilities, persistent policy gaps, and the urgent need for reskilling, regulatory enforcement, and inclusive planning to ensure a Just Transition that protects workers while advancing climate resilience.

Policy-Level Recommendations for a Just Transition

To address climate vulnerability, industry readiness, and just transition for RMG, Leather, Leathergoods and Footwear sectors, recommendations include investing in energy efficiency and renewable energy, developing circular economy models through waste management and recycling, implementing worker skills training for green jobs, strengthening social dialogue for fair policies, improving data collection and transparency on climate impacts, and establishing green funds for sector-specific investments. Bangladesh still doesn't have any Just Transition policy, and no concern is shown in Bangladesh to initiate a Just Transition policy. Even the awareness about Just Transition is very minimal in Bangladesh's labour force. This policy is so emergency for workers, but in this study findings, initially only 20% of workers heard this Just Transition before, rest of the 80% haven't heard this term before. All sectors should also advocate supportive policies, foster collaboration between stakeholders, and ensure workers' voices are integrated into decision-making processes.

Government

- Strengthen labour inspections and monitoring in industrial clusters to ensure compliance with labour rights, occupational safety, and social protection.
- Develop and implement alternative employment and livelihood programs for workers displaced by automation or climate-induced disruptions.
- Design fair transition strategies, including reskilling, financial support, and job placement services for workers entering green jobs.
- Provide financial incentives (green funds, tax breaks, subsidies) to promote renewable energy adoption, energy-efficient upgrades, and climate-resilient infrastructure.
- Introduce climate-responsive leave policies, including mandatory rest breaks during extreme heat and emergency leave during floods or cyclones.
- Develop integrated, gender-responsive climate adaptation and Just Transition policies, safeguarding youth and women workers.
- Prepare a sectoral climate transition roadmap for RMG, leather, leathergoods, and footwear, with clear targets and accountability mechanisms.
- Establish universal health insurance covering climate- and occupational-related risks, including heat stress, chemical exposure, reproductive health, and mental health.
- Map climate vulnerability at the worker level across major industrial clusters, including informal sectors, communities, and supply chains.

Employers / Employer Associations

- Establish worker-led climate safety committees with authority and resources to monitor heat stress, chemical risks, and workplace safety.
- Invest in climate-resilient infrastructure, including ventilation, cooling, flood protection, energy efficiency, and low-emission technologies.
- Promote sustainable practices such as renewable energy, circular economy models, cleaner production, and Zero Liquid Discharge (ZLD) systems.
- Integrate climate adaptation and Just Transition into core business operations and sustainability reporting, aligning with HREDD, EU CSDDD, GSP+, and LDC graduation requirements.
- Collaborate with international buyers/brands to co-invest in sustainable production, worker health, reskilling initiatives, and ensure fair purchasing practices.

International Buyers / Brands

- Ensure ethical sourcing and responsible purchasing practices that enable suppliers to provide living wages and social protection.
- Provide financial and technical support for suppliers to adopt climate-resilient and green production systems.
- Invest in workforce reskilling, green technology adoption, and Just Transition funds, with transparent reporting on outcomes (e.g., % insured, % trained, % represented in safety committees).
- Support a climate risk insurance pool through multi-stakeholder mechanisms, guaranteeing workers' wages during climate-induced factory shutdowns.
- Promote global regulatory compliance (HREDD, EU CSDDD, UK Modern Slavery Act, EU Forced Labour Regulation) to ensure supply chain transparency and labour rights protection.

Trade Unions

- Expand presence in both formal and informal sectors; strengthen capacity in climate literacy, occupational health, labour rights, and emerging global frameworks (HREDD, Just Transition, Forced Labour, Modern Slavery).
- Advocate for Just Transition policies to protect climate-vulnerable workers at government, brand, and supplier levels.
- Lead tripartite dialogues with government and employers on reskilling, social protection, and occupational safety.
- Raise awareness on climate-related health risks (heat stress, fatigue, sickness, heatstroke).
- Negotiate for climate-resilient workplaces, job security, reskilling, and stronger OSH measures through structured social dialogue.
- Advocate for climate vulnerability mapping and the development of national transition roadmaps.
- Push for stronger social safety nets, including pensions, sick leave, maternity benefits, injury compensation, and healthcare.

Civil Society Organisations (CSOs)

- Conduct awareness campaigns on workers' rights, climate risks, and Just Transition, enabling informed worker participation.
- Provide legal aid and support services to workers facing rights violations, workplace injury, or unfair dismissal.
- Facilitate multi-stakeholder dialogue platforms to shape inclusive and evidence-based policy development.
- Monitor and publish independent assessments of labour conditions, OSH compliance, and climate impacts.
- Advocate for gender-responsive adaptation measures, focusing on women workers' health, safety, and skill development.
- Pilot and scale community-based climate resilience programs, including mobile health clinics, green cooperatives, and vocational training.

Chapter 1 Introduction

1.1 Background

Climate change is one of the most pressing global challenges of the 21st century, with far-reaching implications for ecosystems, economies, and societies (Loucks, 2021). As global temperatures rise, the vulnerability of various sectors to climate-related risks becomes more apparent (Formetta & Feyen, 2019). Notably, the ready-made garment (RMG) and leather sectors face elevated risks in the affected industries. Their dependence on natural resources, labour-intensive production processes, and susceptibility to extreme weather events leave them especially vulnerable (Ahmed & Chowdhury, 2016; Nabi et al., 2023). The impacts of climate change threaten not only the economic stability of businesses but also the health and safety of workers, the well-being of local communities, and the broader environment (Tashmin & Islam, 2023).

Bangladesh is the world's second-largest RMG exporter after China, accounting for 8.52% of GDP and 81.49% of exports in fiscal year 2024-25. On the other hand, the leather sector is the country's second-largest export sector after RMG, accounting for approximately 2.37% of total exports (1.15 billion dollars) and 0.25% of GDP in FY 2024-25 (EPB, 2025).

However, climate change poses significant risks to Bangladesh's RMG, Leather, Leathergoods and Footwear sectors, which are critical to the national economy and provide vast employment, particularly for women (Nurul Islam, 2020). These sectors face environmental disruptions, including extreme weather, flooding, and temperature fluctuations, which threaten productivity, health, and supply chains (Akter, 2023; Banani, 2013). Workers, especially in low-income, unprotected environments, are vulnerable to health risks such as heat stress and respiratory issues, with women facing additional reproductive health challenges (Venugopal et al., 2016). Furthermore, inadequate infrastructure and climate resilience exacerbate these vulnerabilities, making climate adaptation a pressing issue (Saleh & Hashemian, 2022).

Studies show that the textile and RMG industries account for 67.8% of emissions, and the RMG sector, a major contributor to greenhouse gas emissions, is under pressure to innovate sustainably (Biswas et al., 2024). According to the World Economic Forum, climate events impact worker performance and pose a serious threat to multinational corporations. By 2030, heat stress from climate change may result in a 4.84% reduction in working hours (ILO, 2019). More than half of workers in this industry report damage and health problems associated with rising temperatures, indicating that climate-related disasters are increasingly impacting them (Nabi et al., 2023).

Climate change affects leather workers in various ways, including increased pollution, dangerous working conditions, and heat-related illnesses. The situation for tanning workers is already severe, with environmental pollution from industry posing serious health risks. For example, workers at tanneries experience high rates of skin disorders (31%), gastrointestinal issues (58%), and jaundice (19%) due to the large amounts of toxic waste they release, such as carcinogenic chromium (Rabbani et al., 2020). However, these health risks are worsened by outdated technologies and ineffective waste management systems. Consequently, leather workers face a dangerous situation because of the combined effects of industrial pollution and climate change. The alarming fact is that Bangladesh is the most vulnerable country to climate change, facing challenges in managing economic growth, environmental sustainability, and social justice. Addressing these issues requires the concept of a Just Transition, which ensures that shifting to a low-carbon economy is inclusive, fair, and beneficial for workers and communities dependent on carbon-intensive industries (McCauley & Heffron, 2018). This is especially relevant for the RMG, Leather, Leathergoods and Footwear industries, which support the country's economy and jobs but have a significant environmental impact. While climate change is recognized as a global challenge, there is a lack of focused research on its specific effects on Bangladesh's RMG, Leather, Leathergoods and Footwear sectors.

Most current studies focus broadly on climate change impacts, especially heat-related effects (Biswas et al., 2024; Iqbal et al., 2023; Nabi et al., 2023; Rabbani et al., 2020; Saleh & Hashemian, 2022). Additionally, there is limited comprehensive research on the impacts of climate change on workers, communities, and businesses in these sectors, along with pathways toward a Just Transition. There is also little information on how climate change affects workers' occupational and reproductive health or how businesses prepare for climate resilience. Moreover, the concept of a Just Transition-ensuring that workers, especially the most vulnerable, are included in climate adaptation-remains underexplored. This study aims to bridge these gaps and provide targeted solutions for these sectors.

As a highly climate-vulnerable nation, Bangladesh is currently struggling to balance social justice, occupational health, environmental sustainability, and economic growth. A just transition is paramount to ensuring an inclusive shift towards a low-carbon economy, especially for the leather and RMG industries, which are vital economic drivers but have significant environmental impacts. Evidence-based information on how climate change affects businesses, communities, and workers is key to emphasizing the development of Just Transition pathways for affected workers. Therefore, the current study aims to evaluate the effects of climate change on the RMG, Leather, Leathergoods and Footwear sectors, including the implications for industry, workers, and communities, along with pathways to a just transition.

This study is essential as the RMG, Leather, Leathergoods and Footwear sectors are already experiencing climate change impacts that threaten industry sustainability and worker well-being. This research will identify these industries' particular challenges and opportunities, as well as the environment and vulnerable workers. It will guide the RMG, Leather, Leathergoods and Footwear industries in adopting sustainable, climate-resilient practices, enhancing long-term productivity while safeguarding workers' health. The study's emphasis on a Just Transition will help ensure that the transition to climate resilience is fair, inclusive, and socially just, contributing to the broader goals of climate justice and sustainable development.

1.2 Problem Statement

Climate change has emerged as a critical threat to Bangladesh's RMG, Leather, Leathergoods and Footwear sectors, which are not only vital to the country's economy but also provide employment to millions of workers, particularly women. The increasing frequency of extreme weather events, rising temperatures, flooding, and environmental degradation directly undermines industrial productivity, disrupt supply chains, and exposes workers to significant health risks, including heat stress, respiratory illnesses, reproductive health complications, and pollution-related diseases. Despite these vulnerabilities, industrial adaptation measures remain inadequate, with outdated technologies, weak infrastructure, and poor climate resilience compounding the problem.

A review of existing literature reveals that while considerable attention has been devoted to labour rights, occupational health, and climate vulnerabilities within Bangladesh's industrial sectors, these areas of inquiry have predominantly been addressed in a fragmented manner. Most studies have tended to focus either on the economic impacts of climate change (Ahmed & Chowdhury, 2016; Nabi et al., 2023), on workplace safety and health risks (Rabbani et al., 2020; Tashmin & Islam, 2023), or on gender-based inequalities (Venugopal et al., 2016), without adequately integrating these dimensions into a comprehensive analytical framework. Furthermore, there is a paucity of empirical research that specifically examines how climate-induced stresses intersect with workers' health, livelihoods, and socio-economic security in the Ready-Made Garment (RMG) and Leather sectors, despite these sectors being among the most climate-vulnerable and economically significant for Bangladesh (Biswas et al., 2024; Saleh & Hashemian, 2022). The concept of a Just Transition-emphasizing inclusivity, fairness, and worker protection in the shift toward climate-resilient and sustainable industrial practices-remains underexplored in the Bangladeshi context (McCauley & Heffron, 2018). This gap in sector-specific, evidence-based research limits the scope for designing holistic and worker-centered strategies that can effectively respond to the multifaceted challenges posed by climate change.

Against this backdrop, the present study is justified as it endeavors to bridge the gaps by generating an integrated body of evidence on the interlinked challenges of climate change, occupational health, labour rights, and gender disparities within the RMG, Leather, Leathergoods and Footwear sectors of Bangladesh. By employing a mixed-method approach that combines quantitative data with qualitative insights, the research captures both the structural vulnerabilities of industries and the lived experiences of workers, thereby offering a nuanced understanding of sectoral realities (ILO, 2019; Amoadu et al., 2023; Rocha et al., 2022). The study's emphasis on developing pathways for a Just Transition underscores its policy relevance, as it provides actionable recommendations to government institutions, employers, trade unions, and development partners. In doing so, it contributes not only to advancing scholarly discourse but also to informing practical interventions that promote equitable adaptation, safeguard worker well-being, and ensure long-term industrial sustainability in alignment with national and global development agendas (IPCC, 2022; Çevik, 2024; Wolff et al., 2021).

1.3 Objectives of the Study

This study aims to critically examine the multifaceted impacts of climate change on Bangladesh's RMG, Leather, Leathergoods and Footwear Sectors, with a dual focus on industrial operations and the socio-economic well-being of the workers. Guided by an interdisciplinary lens, the research seeks to generate actionable insights for building climate resilience and advancing a worker-centered Just Transition. The specific objectives are as follows:

1. To evaluate the direct and indirect impacts of climate change on RMG, Leather, Leathergoods and Footwear factory operations and workforce;
2. To assess the awareness level, perception, and understanding of climate change and Just Transition principles among key stakeholders;
3. To analyze the current state of climate preparedness in RMG, Leather, Leathergoods and Footwear factories; and
4. To Identify systemic barriers and context-specific barriers and formulate evidence-based, policy-relevant recommendations.

Chapter 2 Literature Review

Climate change is a significant concern for the 21st century (United Nations, 2021). The Intergovernmental Panel on Climate Change (IPCC) has reported that climate change has resulted in a rise in global average temperatures by 1.1°C since pre-industrial times (Sophie Boehm, Kelly Levin, 2022) . The International Labour Organization (ILO) projects that, assuming a global temperature rise of 1.5°C by the century's end, by 2030, approximately 2.2% of total working hours and 880,000 work-life years will be lost globally due to occupational heat stress (ILO, 2019). Exposure to extreme heat events has been linked to numerous adverse health impacts (World Health Organization, 2023). The working population is particularly vulnerable to heat stress compared to the public (El Khayat et al., 2022). Studies have provided clear evidence that rising temperatures will likely worsen the duration, frequency, and intensity of occupational heat stress, threatening both livelihoods and the workforce, particularly in developing countries (Szewczyk et al., 2021; Wolff et al., 2021; Zhu et al., 2021). Workers in low-middle-income regions often perform high-intensity labour under hot and humid conditions, without sufficient policies or interventions to ensure their health and safety (Amoadu et al., 2023; Ansah et al., 2021).

Industrial sectors, especially labour-intensive ones like the production of RMG, Leather, Leathergoods and Footwear sectors, face serious challenges due to climate change (Nabi, 2023). Research shows that industrial sectors worldwide, especially in developing nations, are susceptible to disruptions brought on by climate change (UNCTAD, 2021). Increased energy demand, heat stress, and water scarcity are all consequences of rising global temperatures that have an impact on worker health and productivity (Rocha et al., 2022). Moreover, supply chains are disrupted by extreme weather events, which raise manufacturing costs and lower competitiveness in global markets (Çevik, 2024). Furthermore, South Asia is a hotspot for climate risks; Bangladesh frequently experiences heat waves, cyclones, and floods, all of which harm industrial operations. The RMG, Leather, Leathergoods and Footwear sectors, which rely primarily on water, energy, and labour-intensive processes, are especially vulnerable.

2.1 Impact of Climate Change on Workers' Productivity

Shifts in climate conditions, particularly increases in heat, can significantly affect workers' ability to perform their tasks efficiently (WHO & WMO, 2025). As temperatures rise and extreme weather events occur more frequently, workers may experience heat exhaustion, dehydration, and physical discomfort, all leading to reduced productivity (WHO & WMO, 2025). Workers exposed to heat stress without proper personal protective equipment (PPE), adequate hydration, and sufficient rest breaks are more likely to experience fatigue, which can diminish their ability to maintain successful work output (Amoadu, 2023). Additionally, individuals working in hot environments may encounter confusion and mood swings associated with decreased cognitive performance (Phanprasit et al., 2021). These issues, such as confusion and loss of concentration, can affect interpersonal interactions, thereby limiting productivity and the quality of work output (Nunfam, 2021). When workers in hot environments lack paid sick leave, they may continue working despite being unwell, leading to presenteeism and decreased productivity (Amoadu, 2023). Ongoing exposure to heat stress can also result in absenteeism and employee turnover (Martínez-Solanas et al., 2018). Using piece-rate pay systems, which restrict self-pacing and breaks, can further hinder productivity (Mitchell et al., 2018). When workers perform physical tasks, their bodies produce heat, which must be transferred to the external environment to prevent overheating (Yousef, 2023).). If body temperature exceeds 39°C, heatstroke can develop, and temperatures over 40.6°C can be life-threatening (CDC, 2023). Even before reaching these extreme levels, heat exposures can diminish work ability, reduce mental task performance, and increase the risk of accidents (Kerslake, 1972; RAMSEY, 1995; Ramsey et al., 1983). In addition, shift work and long hours in hot environments are often linked to slower work pace, as workers may begin their shifts already fatigued due to inadequate rest and recovery time (Sett & Sahu, 2014). These impacts are often measured regarding lost labour days or diminished work capacity, resulting in substantial economic consequences, especially in regions with limited adaptation measures and vulnerable to extreme climate conditions (Kjellstrom et al., 2009).

2.2 Impact of Climate Change on Workers' Health

Heat exposure in the workplace is becoming an increasing concern for occupational health, with extreme heat events expected to worsen due to climate change (Moyce et al., 2017). Heat-related illnesses are frequently underreported because their early symptoms are often mild, which makes diagnosis challenging in work environments (Kjellstrom, 2020). Common signs of heat stress include fatigue, sweating, and, in more severe cases, illness. Research on workers in tropical regions and low-middle-income countries, particularly in physically demanding jobs, shows high levels of heat stress. Long-term health effects include cardiovascular diseases, kidney problems, and mental health issues (XIANG et al., 2014a). Previous research highlighted the compounded effect of heat exposure and inadequate sanitation at workplaces, leading to dehydration and poor kidney function (Venugopal et al., 2016).

Table 1: Environmental and Organisational Risk Factors that may increase Susceptibility to Climate-Related Occupational Hazards

Domain	Risk Factors	Sources
Enviornmental	• Environmental conditions (Air temperature, • Heatwave, Extreme weather, etc.), • Heat radiation • Relative humidity • Dry Air Temperature • Solar radiation • Heat radiation • Air pollution • Ambient water vapor pressure • Atmospheric pressure • Wind speed • Air movement	(Habibi et al., 2024a; LUNDGREN et al., 2013a; Moda et al., 2019; Nunfam et al., 2019)
Organisational	• Environmental conditions (Air temperature, • Heatwave, Extreme weather, etc.), • Heat radiation • Relative humidity • Dry Air Temperature • Solar radiation • Heat radiation • Air pollution • Ambient water vapor pressure • Atmospheric pressure • Wind speed • Air movement	(Habibi et al., 2024a; LUNDGREN et al., 2013a; Moda et al., 2019; Nunfam et al., 2019)

Table 2: Summary of Health Impact Related to Climate Change Among Workers

Study Design	Study focus	Health Impact related to Climate Change	Sources
Cross-sectional	Workers with a high risk of workplace heat exposure	heat-related illnesses, injuries, and deaths	(Habibi et al., 2024b; Xiang et al., 2016)
Review	Manual workers	**Physiological Effects:** Cardiovascular diseases, Chronic kidney diseases, Dehydration, Fatigue, Impaired judgment, Heat stroke, Morbidity, Mortality, increase in heart rate, increase in core temperature, increase in blood lactate levels, elevation in blood pressure, urine gravity, Dyslipidemia, Digestive diseases **Mental and Cognitive Effects:** Mental health problems, irritability, lethargy, vigilance decrement, loss of dexterity, coordination, and concentration, impatience, headache, dizziness, and an increase in anxiety level **Behavioural Effects:** Feeling thirsty, waking up early due to hot conditions, an Increase in risk of injury, and longer recovery time	(Habibi et al., 2024b; XIANG et al., 2014b)
Cross-sectional	Workers	Thirst, excessive sweating, headache, tiredness, dizziness, confusion, irritability, enhanced stress, prickly heat, nausea/vomiting, heat cramps, loss of coordination, fainting, heat stroke, diarrhoea, hallucination, weakness, work-related injury, and kidney disease.	(Pogačar et al., 2019)
Review	Working population	Heat exhaustion, heat stroke, increase in core body temperature, increase in skin blood flow, increase in sweating, dehydration, heat fatigue, injuries, discomfort, fatigue, mortality, morbidity, higher burden of respiratory issues,	(LUNDGREN et al., 2013b)

Study Design	Study focus	Health Impact related to Climate Change	Sources
Qualitative study	Women workers	Women who work in hot environments may experience vaginal infections, fetal distress, a racing heart, and mortality	(Flocks et al., 2013)

Climate change has had a major effect on the physical and professional well-being of Ready-Made Garment (RMG) workers in Bangladesh, intensifying problems like infectious and chronic diseases, migration, urbanization, job competition, and wage reductions (Profile, 2017a). Common heat-related symptoms among workers include sweating, headaches, fatigue, dizziness, nausea, gastrointestinal issues, thirst, dry throat, and loss of appetite. Some female workers also reported urinary tract infection (UTI) symptoms. Factory health professionals have identified that these symptoms worsen during summer, with heat contributing to the health issue also noted that workers often experience dehydration from excessive sweating, leading to low blood pressure (Yeasmin et al., 2025).

2.3 Impact of Climate Change on Workers' Livelihood & Social Life

The textile and clothing industries, which rely heavily on low-cost labour, often sustain subpar working conditions, making workers highly susceptible to both environmental and economic changes (Profile, 2017b). Natural disasters, such as floods, droughts, river erosion, earthquakes, and cyclones, further disrupt workers' lives and livelihoods, causing infrastructure damage, loss of income, and displacement. For example, in Bangladesh, severe flooding in 2017 affected over 41 million people and caused an estimated 2 billion USD in damages (Schwitter, 2022). The RMG sector, heavily impacted by these floods, saw disruptions in production and the destruction of workers' homes (Islam & Ahmed, 2022). Also, the concentration of RMG industries in urban areas make them particularly vulnerable to climate-related hazards (Rahman & Khan, 2021). Droughts, river erosion, and earthquakes can damage infrastructure, disrupt supply chains, and displace workers, while poor sanitation and hygiene in the aftermath of these disasters exacerbate health risks (Kabir et al., 2019).

The environmental challenges have led to job loss, migration, and increased job competition, as workers in climate-affected areas have experienced a reduction in job opportunities due to climate change (Abbas, 2017; He et al., 2021). A previous study found that approximately 93% of participants reported that their job scope had been impacted by climate change, with most (52%) noting a decrease in the scope compared to the past (Haque et al., 2023). Qualitative interviews from a previous study highlighted that the job market has become more competitive due to the influx of workers from areas affected by disasters (Chowdhury & Karim, 2022). Garment industry owners are hiring more employees who are willing to accept lower wages (Nabi et al., 2023). While existing social protection systems play a crucial role in addressing the impacts of climate change on workers, they often fail to cover all climate-related risks (ILO, 2021). It is crucial to assess the effectiveness of current policies and identify any gaps to ensure that workers are protected from the economic and health impacts of climate change (ILO, 2022). In the RMG industry, current frameworks are often inadequate, leaving workers, especially women and marginalised groups, vulnerable to unstable economic conditions (Hossain et al., 2019).

2.4 Challenges of Climate Change on Industries

The raw materials cost constitutes the largest portion of the total expenses in Bangladesh's RMG industry (Digitalbinos, 2025). Most raw materials, including cotton, are imported, and their prices have been rising slowly. Climate change may further impact the global supply of raw materials, particularly cotton, due to land scarcity caused by food production needs and biofuel demands (ITC, 2022). This would drive up raw material prices. Additionally, climate-induced migration may increase the labour supply in the RMG sector, as an estimated 200,000 coastal people in Bangladesh are expected to migrate annually due to climate effects (IOM, 2021).

The sector also faces challenges from power shortages and the need to adopt new costs, such as hazard insurance, new building designs, and increased air conditioning due to climate change (World Bank, 2021). The introduction of a carbon tax by the government may further escalate production costs for the RMG industry (Dhaka Tribune, 2025). These factors combined will likely drive up the overall cost of RMG products in Bangladesh (Naeema et al., 2011). Moreover, the sector's global competitiveness is at risk due to rising production costs caused by climate change, which may result in reduced foreign investment, heightened job insecurity, and lower wages (Lokman et al., 2019).

Climate change has an economic impact on the Leather, Leathergoods, and Footwear sectors (Splenda Quality Leather, 2025; Hürriyet Daily News, 2025). Flooding in critical locations can cause delays in raw material imports and finished goods exports, raise costs and diminish reliability for foreign purchasers (World Bank, 2021). This disrupts the supply chain, affecting the entire economy (World Bank, 2022). Energy prices for cooling and water purification are rising, putting pressure on business margins (ADB, 2022). Climate change has a social influence on these industries as well. Leather, Leathergoods, and Footwear workers are exposed to more harmful chemicals and are more likely to develop respiratory ailments when temperatures rise. (ILO, 2019) This poses severe health concerns and reduces their quality of life (Nurul Islam, 2020). Climate-induced industry closures due to flooding or resource scarcity can result in widespread unemployment in impacted areas, worsening societal vulnerability (IPCC, 2022).

2.5 Scope and Pathways to Just Transition

The term "just transition" encompasses concerns about social justice in the shift towards a sustainable economy and society (Newell & Mulvaney, 2013). It has evolved to include broader efforts aimed at promoting jobs, sectors, and economies that are both environmentally and socially sustainable (ILO, 2015). As awareness of the global climate change threat grows, the concept is increasingly linked to actions addressing climate change and the transition to a low-carbon economy (Berthe & Turquet, 2023).

As part of this, the circular economy has become very popular. A circular economy is a system designed to minimize waste and maximize the use of resources by keeping products and materials in use for as long as possible through strategies like reuse, recycling, and refurbishment (Ketul, 2024).

The circular economy is recognized as a key area of innovation for the future growth of the textile and clothing industry (Ellen MacArthur Foundation, 2017). The sector has started embracing the principles of a circular economy in various ways (European Environment Agency, 2022).

Numerous global brands contribute to this transition by fostering and expanding innovative solutions (Textile Exchange, 2021). Bangladesh's ready-made garment sector is increasingly facing "circular" demands from international brands, including better waste management, product and component recycling, carbon emission control, and more effective management of microplastics (BGMEA & GFA, 2022). The textile industry generates approximately 500,000 to 700,000 tons of waste annually, including yarns, cutting scraps, and rejected garments (Haque et al., 2020). In some cases, the waste produced can amount to nearly half of the raw materials required to create the final garments (Ellen MacArthur Foundation, 2017). Through a combination of reuse and recycling methods, this textile waste could be transformed into about 1 billion new garments (Global Fashion Agenda & McKinsey & Company, 2020).

However, Bangladesh is missing the opportunity to effectively utilize these garment waste products (Schröder, 2020).Bangladesh's RMG, Leather, Leathergoods and Footwear industries are susceptible to climate change; policy-driven solutions can increase sustainability, worker protection, and industrial resilience (ADB, 2021). The shift to renewable energy in these industries can offer an opportunity to improve workers' socioeconomic status, job security, and health by reducing pollution and creating new jobs (ILO, 2020). However, for this transition to be effective, it must be inclusive, ensuring that all workers, especially the most vulnerable, benefit from the change (Shahajada Mia & Masrufa Akter, 2019).

Despite its potential for economic growth and poverty reduction, the transition faces challenges such as limited social protection, unskilled labour, and inadequate infrastructure (World Bank, 2022). To achieve a fair transition, strengthening social protection, improving infrastructure, and fostering cooperation among stakeholders are essential (Rakib et al., 2015). A worker-centric Just Transition Framework can help guarantee that adaptation efforts do not disproportionately affect vulnerable workers (ILO, 2018).

2.6 Bangladesh Labour Law and Future Resilience

The Bangladesh Labour Act of 2006 ensures workers' rights to form and join trade unions to manage relationships with employers and address workplace issues (BLA, 2006; Syed, 2024). Employers cannot prevent union membership, discriminate against unionized workers, or dismiss them for union involvement (BLA, 2006, s. 195; BLA, 2006, s. 228). However, workers must refrain from unlawful strikes or coercion in union activities. Trade unions focus on negotiating wages, improving working conditions, resolving disputes, establishing legal protections, and fostering cooperation between employers and employees (Hyman, 2001; ILO, 2021; Freeman & Medoff, 1984). The Act also promotes worker participation in establishments with at least 50 employees by setting up Participation Committees (BLA, 2006, s. 205; ILO, 2025). The committees meet at least twice a month to discuss concerns, ensuring compliance with labour laws, improving safety and working conditions, and promoting worker welfare, education, and productivity (BLA, 2006, s. 207). They help improve accountability, workplace efficiency, and communication (Bangladesh Labour Act, 2006, 2006). However, the current labour law in Bangladesh is not strong enough to protect workers from the new challenges caused by climate change and changes in industries or the economy.

As the environment changes with rising temperatures, floods, or other extreme weather--many workers are facing serious health risks and even losing their jobs (ILO, 2019; IPCC, 2022).

However, the existing labour law does not include specific rules or protections to deal with these kinds of problems (ILO, 2021). For example, it does not mention how to keep workers safe from extreme heat or how to support workers who lose their jobs because of climate-related disruptions. In today's rapidly changing world, where both the climate and industries are evolving fast, there is a growing need for updated legal protections (World Bank, 2020). These should include health and safety measures for heat stress, support for job transitions, and rights for workers affected by environmental risks (ILO, 2019).

Bangladesh Landscape against Climate Change In addressing climate change, the Government of Bangladesh (GoB) has spent several decades developing effective action plans, strategies, and policies aimed at safeguarding public health (GoB, 2009; MoEFCC, 2018). These efforts are centered on enhancing adaptive capacity, boosting resilience, and minimizing the country's vulnerability to climate-induced risks (MoEFCC, 2018; IPCC, 2022). The following are some of the major policies and strategies adopted by the GoB over time.

Table 3: Key National Policies Addressing Climate Change and Health in Bangladesh

Policy	Description	Sources
Bangladesh Climate Change Strategy and Action Plan (BCCSAP), 2009 updated in 2022	The Bangladesh Climate Change Strategy and Action Plan (BCCSAP), developed by the Ministry of Environment, Forest and Climate Change (MoEFCC), is the country's key framework for addressing climate change. The 2022 update expands the plan to eleven themes, including natural resource management, gender, and urban climate. It focuses on six pillars: 1) food security and health for vulnerable groups, 2) disaster management, 3) infrastructure maintenance, 4) climate research, 5) low-carbon development, and 6) capacity building. The BCCSAP aims to strengthen resilience, reduce vulnerability, and support sustainable growth	(MoEF, 2009)
Bangladesh Climate Change Strategy and Action Plan (BCCSAP), 2009 updated in 2022	The Bangladesh Climate Change Strategy and Action Plan (BCCSAP), developed by the Ministry of Environment, Forest and Climate Change (MoEFCC), is the country's key framework for addressing climate change. The 2022 update expands the plan to eleven themes, including natural resource management, gender, and urban climate.	(MoEF, 2009)

Policy	Description	Sources
	It focuses on six pillars: 1) food security and health for vulnerable groups, 2) disaster management, 3) infrastructure maintenance, 4) climate research, 5) low-carbon development, and 6) capacity building. The BCCSAP aims to strengthen resilience, reduce vulnerability, and support sustainable growth.	
Bangladesh's Nationally Determined Contributions (NDC) 2015	Bangladesh's initial NDC, submitted in 2015, targeted greenhouse gas (GHG) reductions mainly in power, industry, and transport sectors, combining resilience-building with low-carbon development. The 2021 enhanced NDC expanded mitigation targets to the whole economy covering energy, industrial processes, agriculture, forestry, and waste with 2012 as the new baseline year. It sets ambitious unconditional and conditional emission reduction goals backed by international support, aiming to limit emissions growth while fostering a climate-resilient, low-carbon economy. Adaptation is a core focus, particularly on health impacts of climate change, reflecting Bangladesh's priority to protect vulnerable populations. The update follows international transparency guidelines and contributes to the global Paris Agreement goal of limiting warming to (1.5–2) °C.	(Natioanally Determined Contributions (NDCs) Bangladesh, 2021)
National Adaptation Plan (NAP) 2023-2050	The National Adaptation Plan (NAP) strengthens Bangladesh's climate adaptation across eight sectors, including water resources, disaster management, agriculture, and urban areas. It identifies 11 climate stress areas and proposes 113 interventions, 90 of which are high-priority. The plan also addresses cross-cutting issues like health, gender, and private sector participation. Highlighting risks to water, food security, infrastructure, and livelihoods, it predicts 20 million climate migrants by 2050 and rising GDP losses. The NAP outlines six national goals, focusing on protecting communities, building resilient agriculture, developing climate-smart cities, and promoting nature-based solutions. It relies on 23 strategies and 28 outcomes to enhance resilience, governance, and innovation for sustainable growth.	(National Adaptation Plan of Bangladesh (2023-2050)
The National Environmental Policy (2018)	Bangladesh's National Environmental Policy (2018) focuses on environmental conservation and safety in development projects, particularly in the health sector, to meet current and future needs. It promotes efficient use of natural resources like water, land, and natural gas, advocating for renewable energy adoption to ensure sustainable development. The policy aims to encourage eco-friendly production and consumption for a green economy.	(National Environmental Policy, 2018)

However, policy implementation faces challenges such as bureaucratic hurdles and a lack of transparency within the system. Identifying and reaching eligible beneficiaries is frequently problematic (ADB, 2021; Khan & Islam, 2022). To create effective policies, the government must engage with stakeholders, address violations, and ensure targeted interventions (UNDP, 2020; Rahman & Jahan, 2021). Additionally, promoting a Just Transition requires considering both the social and economic impacts on workers, alongside the economic effects (ILO, 2015; Newell & Mulvaney, 2013).

While Bangladesh has made progress in developing climate-related policies and plans, these are not worker-centric (Ahmed & Neelormi, 2021; ILO, 2019). They often overlook or insufficiently address the specific challenges that workers face due to climate change. Despite the country's high vulnerability to climate impacts, there is no dedicated strategy within national climate frameworks that focuses on protecting workers, supporting their adaptation, or building their resilience, especially those employed in labour-intensive and informal sectors.

As a result, a significant portion of the workforce remains unprotected in the face of rising environmental and economic risks.

2.7 Global Best Practices

Globally, best practices for ensuring a Just Transition in the leather and RMG sectors focus on inclusive governance, environmental sustainability, and workforce protection (UNIDO, 2021). One of the foundational approaches is tripartite social dialogue, where governments, employers, and workers jointly develop and implement transition strategies. A notable example is the collaboration between the ILO and the China National Textile and Apparel Council (CNTAC), which facilitated social dialogue and stakeholder engagement under the UN's PAGE initiative (ILO, 2022) . Alongside this, there is a strong emphasis on green job creation and skills development. Countries like India and Vietnam have launched training programs to upskill garment workers in digital technologies, eco-friendly production, and circular design, ensuring that workers are not left behind in the green shift (IndustriALL, 2024).

Chapter 3 Methodology

Research Philosophy: This study is grounded in a pragmatist philosophy, recognizing that no single methodological orientation can fully capture the complex, multidimensional impact of climate change on RMG, Leather, Leathergoods and Footwear sectors in Bangladesh. Pragmatism allows for the integration of both objective (quantitative) and subjective (qualitative) perspectives, focusing on practical outcomes that inform worker-centric policies and Just Transition pathways.

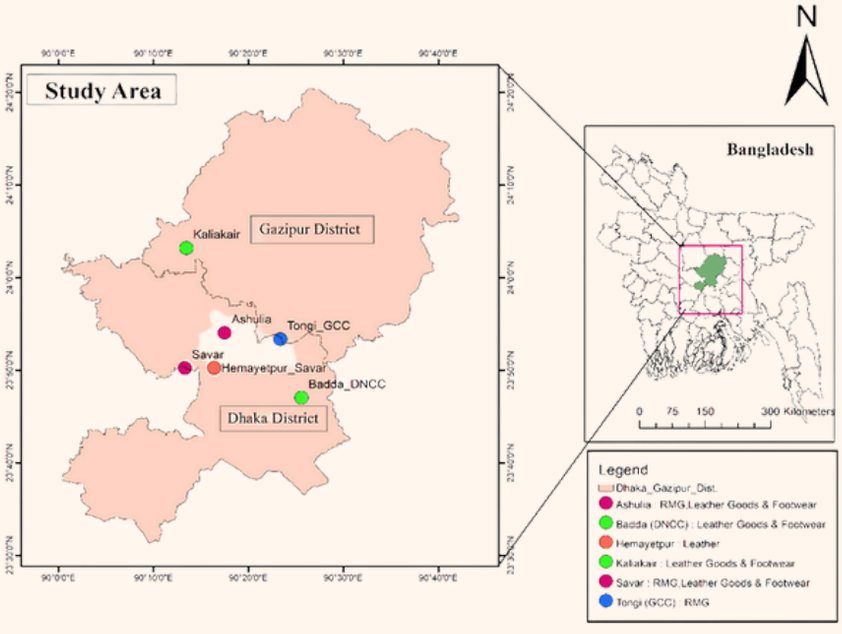
Research Approach: A mixed-method approach was adopted, combining deductive reasoning (testing predefined concepts such as climate impacts, adaptation, readiness, and Just Transition opportunities) with inductive reasoning (deriving new themes from lived experiences and stakeholder narratives).

This dual approach ensured both theory validation and theory generation.

Research Strategy: The study applied multiple complementary strategies:

- Survey research (structured questionnaires among workers) to quantify the scale and distribution of climate change impacts.
- Case study approach to capture individual worker experiences and sectoral dynamics.
- Interviews and Focus Groups to obtain rich qualitative insights from stakeholders and workers.
- The study was conducted in Dhaka (Savar, Ashulia, Hemayetpur, DNCC) and Gazipur (Tongi, Kaliakair), areas where RMG, Leather, Leathergoods and Footwear industries are concentrated.

Figure 1: Study area map



Research Design: A multi-method design, specifically a mixed-methods approach, integrating both qualitative and quantitative techniques was used. This choice enabled triangulation of data, enhancing the validity, reliability, and comprehensiveness of findings.

- **Quantitative:** Structured survey of 700 workers (400 from RMG, 150 from leather, 150 from footwear/leather goods), proportionally allocated based on industry size and economic contribution. The sample size exceeded the statistical threshold for robust analysis (Creswell & Creswell, 2018; Bryman, 2016).
- **Qualitative:** Semi-structured interviews (SSIs), 44 Key Informant Interviews (KIIs) with government officials, trade unions, business associations, and CSOs; 7 Focus Group Discussions (FGDs) with workers; and 8 case stories across RMG, Leather, Leathergoods and Footwear sectors.
- **Time Horizon:** The study was designed as a cross-sectional research project, with data collected within a fixed period (27th April to 25th June 2025). This design provided a snapshot of current challenges, opportunities, and sectoral readiness regarding climate change and Just Transition.

Techniques and Procedures

- **Quantitative Data Collection & Analysis:** Field survey was administered using structured questionnaires and then data cleaned, coded, and processed in Microsoft Excel (2021) before statistical analysis in SPSS (v25.0).

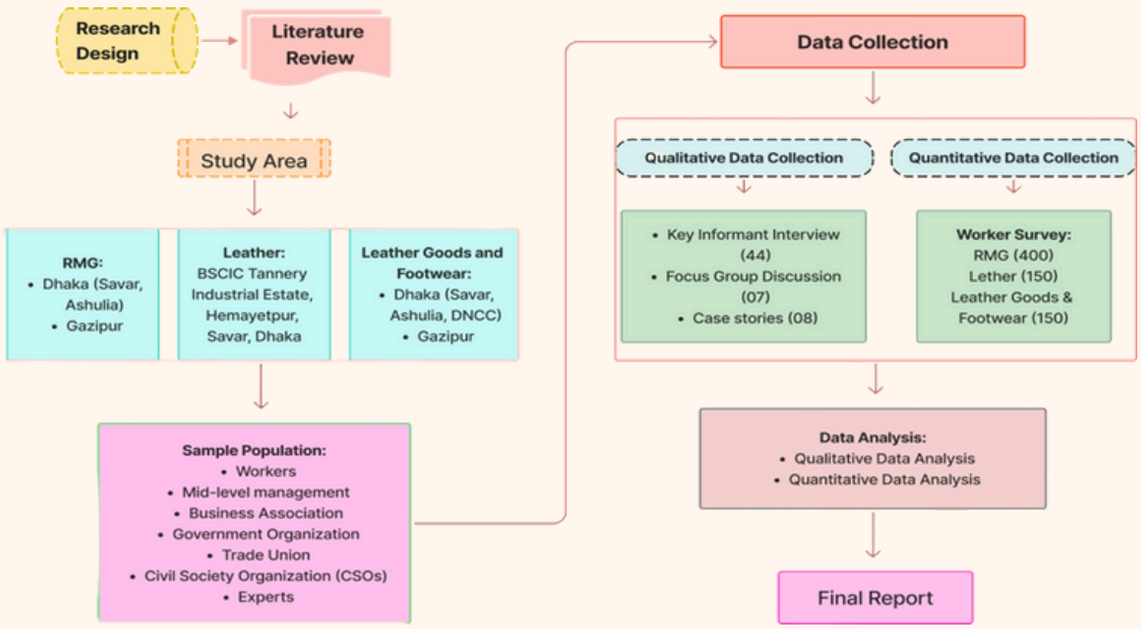
Regarding quantitative analysis, descriptive statistics and cross-tabulations were used to identify sectoral variations.

- **Qualitative Data Collection & Analysis:** A Semi-structured interview guidelines were developed after a literature review and pre-testing for qualitative data collection, where all KIIs, FGDs, and case stories were audio-recorded with consent and transcribed verbatim. After that, thematic analysis was applied to identify recurring themes, challenges, opportunities, and adaptation practices. On the other hand, case narratives are supported with descriptive texts and photographs.

Ethical Considerations: The study adhered strictly to ethical research standards (Helsinki Declaration; Jahangirnagar University Ethical Clearance Ref No: BBEC, JU/M 2025/05 (253)):

- **Informed Consent:** Participants were briefed on the study objectives and their rights prior to participation.
- **Confidentiality & Anonymity:** Identities were anonymised; photographs were used only with explicit consent.
- **Quality & Supervision:** Trained enumerators conducted surveys under daily field supervision to ensure adherence to protocols and minimise bias.

Figure 2: Study framework



Limitations of the Study: Although this study provides valuable insights and makes essential contribution to understanding climate change impacts on the RMG, Leather, Leathergoods and Footwear sectors in Bangladesh, it has some limitations.

- **Limited Geographic Coverage:** The study focused on selected industrial hubs, Dhaka, Ashulia, Savar, Gazipur, and the BSCIC Tannery Estate in Hemayetpur. While these locations represent major clusters for the sectors studied, they may not fully capture the range of climate vulnerabilities and operational conditions of factories in other regions.
- **Absence of Real-Time Environmental Measurements:** The study relied mainly on the perceptions and experiences of workers, management, and stakeholders to assess environmental factors. No direct, real-time measurements such as indoor air quality monitoring, temperature logging, or chemical concentration tests were conducted.
- **Exclusion of Informal or Home-Based Units:** The research focused on formal factory settings and did not include workers in informal or home-based production units. These informal work arrangements often lack regulation and are likely more vulnerable to climate-related shocks, which may lead to an underestimation of the accurate scale of risks and challenges.
- **Reliance on Self-Reported Data:** This study's qualitative and quantitative findings are based on self-reported information provided by workers, management representatives, and key stakeholders. As with any self-reported data, there is a risk of recall bias, social desirability bias, or underreporting of sensitive issues, which may affect the accuracy and objectivity of some results.
- **Cross-Sectional Design and Short Data Collection Period:** The study employed a cross-sectional approach, capturing impacts and perceptions at a single point in time. This limits the ability to reflect seasonal variations, track long-term adaptation efforts, or assess changes in production conditions and workers' health over time.

Field Challenges: Numerous challenges were encountered by the research team during surveys, and these were efficiently managed to ensure data accuracy and data quality promptly.

- **Hurdles Encountered During Qualitative Data Collection:** A significant hurdle faced during the project was gathering qualitative data from a large number of stakeholders in the Ready-Made Garment (RMG) and Leather sectors. Scheduling interviews was particularly challenging; many participants would confirm an interview time but then become unresponsive, leading to delays and extra time spent rescheduling. This inconsistency in the availability of key individuals made it challenging to keep the project on schedule, despite persistent efforts to engage them.
- **Challenges in Obtaining Factory Permissions in the RMG, Leather, Leathergoods and Footwear sectors:** Another significant challenge arose from obtaining permissions to conduct surveys inside factories, particularly during the Eid (Muslim Festival) vacation period. During this time, the RMG, Leather, Leathergoods and Footwear sectors were under intense pressure to meet production deadlines, and factory management refused to allow data collection inside the premises. Although permissions were eventually granted, these delays created additional pressure on the project team to meet the data collection targets within a constrained timeframe.
- **Limited Timeframe for the Project:** The project had a tight timeline, which posed a significant challenge given the complexity of the study. The research encompassed three different sectors-RMG, Leather, and Leathergoods & Footwear- each with a large sample size and requiring both qualitative and quantitative data collection. The limited timeframe meant the project team had to carefully manage scheduling and resources, often working under pressure to meet deadlines. This was especially challenging when combined with delays in obtaining factory permissions (especially RMG and Footwear), managing enumerator fatigue, and overcoming the other logistical hurdles.
- **Difficulty in Obtaining Consent for the Use of Photos/Images:** Obtaining consent for the use of photos or images during data collection proved to be another challenge. Even with all ethical guidelines strictly followed, most participants declined to consent to having their photos taken.

- This reluctance may have stemmed from concerns about privacy or a misunderstanding of the study's objectives. As a result, the team had to find alternative ways to document data collection, which sometimes led to the loss of valuable visual documentation.
- **Long Waiting Times for Conducting Surveys:** On several occasions, data enumerators faced long waiting times before being able to conduct surveys. This was particularly challenging when communicating with factory managers and other stakeholders with competing priorities or limited availability. These delays not only affected the schedule but also led to frustration among both enumerators and participants. The waiting time created inefficiencies in the overall data collection process, extending the project timeline.
- **Lack of Motivation for Prolonged Questionnaires:** The questionnaire used in the study was comprehensive, requiring approximately 20 to 30 minutes for completion. One significant hurdle was the lack of motivation among participants to complete such a lengthy questionnaire. As the survey progressed, many participants began losing interest, which resulted in incomplete responses or rushed answers.
- **Lack of Participants' Knowledge about Study Objectives:** Another challenge faced during the data collection process was the limited understanding of the study's objectives by many participants, particularly workers and mid-level management in the RMG, Leather, Leathergoods and Footwear sectors. Many participants lacked the necessary background knowledge of the study's goals, so their responses were incomplete and vague. This knowledge gap hindered the depth and relevance of the qualitative data collected.
- **Data Enumerators' Fatigue Due to Extreme Weather Conditions:** Data collection occurred in challenging environmental conditions, especially in Tongi, Gazipur, Bangladesh, for the RMG sector. Several enumerators reported feeling exhausted and falling ill due to the extreme heat. Additionally, in Footwear, the enumerators had to contend with irregular rainfall, which caused further discomfort and disrupted transportation and logistics during the data collection process.
- **Unpleasant Odour in Leather Sectors:** During data collection in the Leather sector, several data enumerators reported experiencing unpleasant odours despite wearing protective masks. These strong odours, typical of the leather production process, created a challenging working environment and affected the comfort and concentration of the enumerators.

Chapter 4 Study Findings

4.1 Demography of Respondents

The demographic profile of respondents across the RMG, Leather, and Footwear sectors reveals significant differences in workforce composition, socio-economic conditions, and living standards highlighting distinct vulnerabilities and implications for climate resilience and a Just Transition.

The demographic profile of respondents across RMG, Leather, Leathergoods and Footwear sectorsreveal important differences in workforce composition, socio-economic characteristics, and living standards. These variations underscore distinct vulnerabilities to climate risks and have significant implications for designing a Just Transition framework.

Gender Distribution: The study included 700 workers from the RMG, Leather, Leathergoods and Footwear sectors (RMG: 400; Leather: 150; and Footwear: 150). Among them, 53.1% were male and 46.9% were female, showing nearly equal gender distribution across these industries, although this may differ slightly by sectors. For example, RMG is often female-dominated 60.3% and Leather is male-dominated 86.7%, while Leathergoods and Footwear sector shows a more balanced gender distribution 44.7% female. In the case of RMG, it reflects the long-standing role as a major employer of women in Bangladesh while Leather focuses the physically demanding and hazardous nature of tannery work.

Age and Workforce Dynamics: The average worker in the RMG, Leather, Leathergoods and Footwear sectors is only 25.1 years old which is very young workforce. This reflects high youth migration from rural areas seeking employment. Highlighting the sector specific data, the youngest workforce is in the Leathergoods and Footwear sector (mean age: 26.12), followed by RMG (mean age: 28.21), while leather workers are relatively older (mean age: 30.93). This suggests that the RMG and footwear industries attract younger entrants, whereas leather jobs may involve more experienced or long-term labourers.

Marital Status and Family Dependence: In general, about 80.7% of the workers are married highlighting over 8 out of 10 workers are married. On the other hand, a high proportion of workers are married 84.5% in RMG, 72.7% in leather, and 78.7% in footwear indicating that most support families, increasing their economic vulnerability to climate-related job disruptions. Majority of workers support small households (≤5 members with 80.3%), but nearly 1 in 5 support large families (≥6 members with 19.7%) including extended kin, elderly parents, or multiple children. Highlighting the sector specific data, it is found that larger household sizes (≥6 members) are more common in the leather (30%) and footwear 22% sectors, compared to RMG 15%, implying greater financial pressure on these workers.

Education Level: Educational attainment is generally low across all sectors. The typical RMG, Leather, Leathergoods and Footwear worker has completed primary school and some secondary education, but few have completed higher secondary or beyond. Only 10.5% have reached higher secondary or graduate level indicating severe limitations in skill mobility and upward economic progression. In the case of sector focused data, over 80% of RMG and leather workers have only primary or secondary education. Illiteracy is highest in the leather sector 14.7%, followed by footwear 8%, signalling limited access to information, training, and participation in decision-making processes key barriers to climate adaptation and green skill development.

Income Levels: The average monthly wage for the RMG, Leather, Leathergoods and Footwear workers identified BDT 13,208/month and BDT 17,780/month with overtime. Overtime contributes 34.6% increase to income indicating heavy reliance on extra hours for survival. All three sectors show wages near or below minimum wage thresholds from sector specific. For example, despite longer hours and hazardous conditions, leather workers earn the lowest average monthly wages (BDT 12,420; BDT 15,744 with overtime), even lower than RMG (BDT 13,208 or 18,719)

thresholds from sector specific. For example, despite longer hours and hazardous conditions, leather workers earn the lowest average monthly wages (BDT 12,420; BDT 15,744 with overtime), even lower than RMG (BDT 13,208 or 18,719) and footwear (BDT 13,997 or 17,310). This income disparity persists despite higher occupational risks in leather, pointing to systemic inequities in wage structure and labour protection.

Geographic Concentration: RMG and footwear factories are spread across Savar, Gazipur, and Ashulia, industrial zones prone to flooding and urban heat islands. Leather workers are concentrated in Hemayetpur (Savar), an area historically associated with tanneries and severe environmental pollution, compounding climate and health risks.

Table 4: Demography of the Respondents

Category	RMG	Leather	Footwear
Sample Size	400	150	150
Gender Distribution	Female: 60.3%, Male: 39.7%	Male: 86.7%, Female: 13.3%	Male: 55.3%, Female: 44.7%
Marital Status	Married: 84.5% Unmarried: 12.8% Others: 2.7%	Married: 72.7% Unmarried: 26.7% Others: 0.6%	Married: 78.7% Separated: 0.7% Unmarried: 16.7% Widow/Widower: 2.0% Divorced: 2.0%
Number of family members	≤5 members: 85% ≥6 members: 15%	≤5 members: 70% ≥6 members: 30%	≤5 members: 78% ≥6 members: 22%
Age Distribution	18–29: 60%; 30–39: 32.8% Mean: 28.21	18–29: 48.7%, 30–39: 34%, 40+: 17.3%, Mean: 30.93	18–24: 40%, 25–30: 42.7%, 31+: 17.3%, Mean: 26.12
Education	Primary: 39.3%, Secondary: 42.3%, Higher Secondary: 7.3%	Illiterate: 14.7%, Primary: 46%, Secondary: 26.7%, Higher Secondary: 10.7%, Graduate: 2%	Illiterate: 8%, Primary: 32%, Secondary: 43%, Higher Secondary: 13%, Graduate: 4%
Income (BDT) (Mean)	Wages: 13,208; With Over Time: 18,719	Wages: 12420; With Over Time: 15,744	Wages: 13,997; With Over Time: 17,310
Geographic Concentration	Savar: 39.3%, Gazipur: 31%, Ashulia: 29.7%	Hemayetpur: 100%	Ashulia: 41.3%, Savar: 30%, Dhaka: 20.7%, Gazipur: 8%

4.2 Working Conditions of Workers

The occupational profiles across the RMG, Leather, and Footwear sectors reveal critical differences in job roles, production processes, work intensity, and labour conditions factors that shape workers' exposure to climate risks and their capacity to adapt.

Working Sections: In the RMG sector, over half of the workforce 59.3% is engaged in sewing, reflecting the labor-intensive nature of garment production and exposed to heat stress and musculoskeletal disorders during extreme temperatures, while low percentages in cutting 3.8% and packing 3.6% suggest high automation or outsourcing of these stages. The leather sector shows a more diversified structure, with 38% in crust/finishing, 15.3% in tanning, leather cutting and design 9.3% and 14% in maintenance. Workers in beam-house and tanning sections face direct exposure to toxic chemicals (e.g., chromium, acids) and high heat, increasing health risks under climate stress. In footwear, key roles include sewing 44.7%, lasting 17.3%, and cutting 14.7%, which involve prolonged standing and physical strain conditions worsened by rising indoor temperatures and inadequate rest facilities.

Work Experience: In the RMG sector, only 16.2% of workers have more than 10 years of experience. A large portion 47.5% have 3 years or less of experience (33% with 1-3 yrs + 14.5% with <1 yr). This indicates a sector with high employee turnover. This is consistent with the often-repetitive nature of sewing tasks, which can lead to burnout, and the sector's large size, which creates a constant need for new workers. In contrast, leather workers show greater tenure with 52.7% of workers have more than 5 years of experience. Combined with the 29.3% with 2-5 years, this means 82% of the workforce has at least 2 years of experience.

This indicates a highly stable, skilled, and experienced workforce. This is likely due to the specialised, technical nature of the work (e.g., tanning, chemical handling) which requires training and retains workers

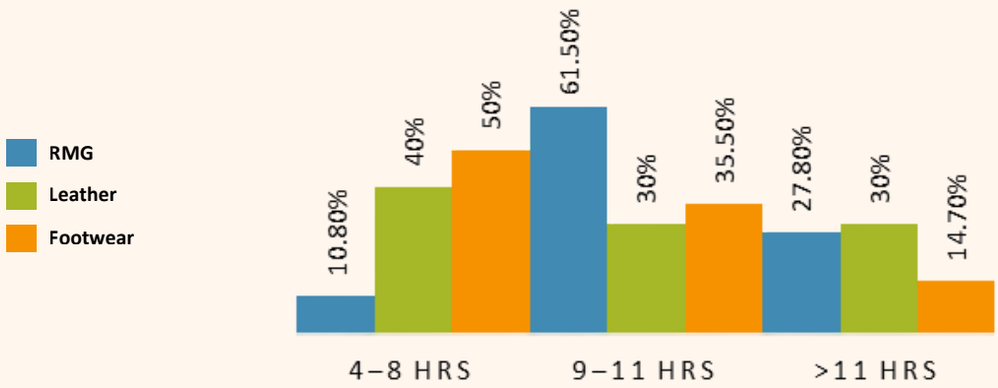
In footwear, about 76.7% have more than 3 years of experience, suggesting moderate stability, though nearly a quarter are new entrants (<2 years), which also points to a more stable workforce due to the need for skilled manual labour.

Geographic Concentration: RMG and footwear factories are spread across Savar, Gazipur, and Ashulia, industrial zones prone to flooding and urban heat islands. Leather workers are concentrated in Hemayetpur (Savar), an area historically associated with tanneries and severe environmental pollution, compounding climate and health risks.

Working Hours: The analysis of working time patterns across the RMG, Leather, Leathergoods and Footwear sectors underscores a pervasive culture of extended hours that heightens both occupational fatigue and climate vulnerability. Nearly half of all surveyed workers (49.2%) report working between 9–11 hours per day, making moderate overtime the prevailing norm. An additional 25.5% endure excessive overtime exceeding 11 hours daily, while only one-quarter (25.5%) work within the standard 8-hour limit prescribed by law.

Sectoral variations are notable: the RMG workforce is the most affected by long hours, with 61.5% working 9–11 hours and 27.8% exceeding 11 hours, particularly during peak export seasons. In the Leather sector, 30% of workers reported shifts of 12 hours or more per day, with only 40% working the legal 8-hour standard, reflecting systemic weaknesses in labour regulation and enforcement. By contrast, Footwear factories demonstrate comparatively better compliance, with 50% of workers adhering to 8-hour shifts, though 35.5% still report 8–10 hours, indicating that overtime remains structurally embedded in production practices.

Figure 3: Sector-specific Working Hours



Weekly Working Days: Weekly workday patterns further expose labour intensity and sectoral disparities. While the majority of workers (81.4%) reported adhering to a 6-day week, in line with national legislation, almost one in five (18.1%) work without any weekly rest. This practice is overwhelmingly concentrated in the Leather sector, where 53.3% of workers reported 7-day workweeks, signaling exploitative arrangements, particularly in informal or subcontracted tanneries. In contrast, Footwear (98%) and RMG (89%) workers largely conform to the 6-day standard, with limited incidence of 7-day schedules (2% and 11%, respectively). The absence of mandated rest days in the Leather sector undermines workers' capacity for physical recovery, amplifies fatigue-related health risks, and reduces resilience to climate-induced stressors such as extreme heat, poor air quality, and high humidity. These findings reveal how excessive working hours and the denial of weekly rest not only violate labour rights but also exacerbate climate vulnerability and erode long-term productivity.

Table 5: Working Information

Dimension	RMG Sector	Leather Sector	Footwear Sector
Working sections	Sewing (59.3%), Finishing (10.8%), Cutting (3.8%) Packing (3.6%), Ironing (2%), Others (20.7%)	Beamhouse (6%), Tanning section (15.3%), Crust or finishing section (38%), Chemical handling (4%), Leather Cutting & Design (9.3%), Packaging (5.3%), Maintenance/Equipment (14%), Service/Support Department (8%)	Sewing (44.7%), Lasting (17.3%), Cutting (14.7%), Sole (7.4%), Finishing (3.3%), Inspection (2.8%), Others (9.8%)
Work experience	33% with 1–3 yrs; 21.3% with 4–6 yrs; 15% with 7–10 yrs; 16.2% with >10 yrs; 14.5% with <1 yr	52.7% with >5 yrs; 29.3% with 2–5 yrs; 18% with <2 yrs	Sewing (44.7%), Lasting (17.3%), Cutting (14.7%); Sole (7.4%), Finishing (3.3%), Inspection (2.8%) Others (9.8%)
Working hours	61.5% with 9–11 hrs/day; 27.8% with >11 hrs; 10.8% with 8 hrs	40% with 8 hrs/day; 30% with 9–10 hrs/day; 30% with ≥ 12 hrs/day;	Sewing (44.7%), Lasting (17.3%), Cutting (14.7%), Sole (7.4%), Finishing (3.3%), Inspection (2.8%) Others (9.8%)
Weekly working days	89% worked 6 days; 11% worked all 7 days	44.7% worked 6 days; 53.3% worked all 7 days	Sewing (44.7%), Lasting (17.3%), Cutting (14.7%), Sole (7.4%), Finishing (3.3%), Inspection (2.8%), Others (9.8%)

4.3 Climate-induced Migration Status

Though Bangladesh produced only 0.48% of global greenhouse gas emissions in 2021 which represented an increase from 2020 by 7.9% (Emission Index, 2024). However, Bangladesh is the most vulnerable to both disasters and climate change due to geography, poverty, and weak coping capacity. According to Global Climate Risk Index 2021, Bangladesh ranked the 7th extreme disaster risk-prone country in the world as per the report from the (UNDP, 2023), while the World Risk Index (WRI) ranked it ninth in 2023 and 2024, with the WRI score slightly increasing to 27.73 in 2024. This high vulnerability is driven by major climate-induced hazards like tropical cyclones, floods, erosion, and droughts, which are exacerbated by rising sea levels. By 2050, Bangladesh will lose 17 percent of its territory due to rising sea levels, resulting in the loss of 30 percent of the country's agricultural land. The rise in sea levels in coastal areas is prompting mass migration into cities, further straining the country's resources (Karim et al., 2024).

Thus, it will drive to urban vulnerability since rural communities migrate to cities to escape climate impacts, Dhaka, already one of the world's most densely populated cities, is struggling to cope. The capital city is experiencing frequent flash floods due to unplanned urban development and a poor drainage system. As a result, waterlogging has become a regular occurrence during the monsoon season, disrupting the lives of millions. In addition to floods, Dhaka faces extreme heat, exacerbated by the urban heat island effect. With minimal green spaces and insufficient infrastructure to handle the surging population, the city's resilience to climate impacts is being tested (Karim et al., 2024).

Climate-induced migration in Bangladesh involves millions of people displaced by climate disasters like floods, riverbank erosion extreme heat, or other environmental stresses that disrupt livelihoods in their home regions and pushing them to urban areas like Dhaka in search of work, often leading to increased vulnerability and a shift to informal labor in brick kilns, agriculture, and urban services, as local livelihoods become unsustainable (Duque, 2024). While some of them make their place to the formal sectors like RMG, Leather and Footwear sectors with low wages due to lack of education, technical and vocation training, social networks and aspiration for better life. This internal movement strains urban resources and can trap migrants in cycles of poverty and modern slavery due to a lack of support systems and safe migration pathways. This type of migration directly affects labour market to cheap labour, precarious working conditions, and economic stability in these sectors. A recent study by BILS (2025) found that about 36% worker displacement due to climate factors in RMG sector, with increased factory heat impacting two-thirds of workers and hitting women hardest (BILS, 2025).

About 91.5% of RMG, Leather, Leathergoods and Footwear workers in this study are internal migrants indicating that labor mobility from rural to industrial zones is near-universal in these sectors including RMG (94.2%), Leather (91.3%), and Footwear (84.7%), primarily from climate-vulnerable regions such as Rangpur, Mymensingh, and Noakhali. While approximately 10.3% of surveyed RMG, Leather, Leathergoods and Footwear workers reported climate-driven migration, suggesting it is a non-negligible factor in workforce mobility across the sector. Among surveyed workers, 12.6% of footwear workers, 10.8% of RMG workers, and 6.6% of leather workers reported that their migration was directly driven by climate-related events such as river erosion, salinity intrusion, or cyclones.

In the RMG sector, migration is highly concentrated in northern districts. Rangpur leads with 9%, followed by Mymensingh (7.50%) and Nilphamari (7.25%). Other notable sources include Bogura (5.50%), Sherpur (4.75%), Jamalpur (4.75%), and Kurigram (4.50%). Districts such as Gaibandha (3.50%), Sirajganj (2.75%), and Rajshahi (2.25%) also contribute significantly to the RMG labor force. Housing conditions have worsened climate impacts. Most workers (94.2%) were migrants living in overcrowded or poorly ventilated rooms. Almost 38% believed climate change increased their risk of displacement. Family life was affected, with 28.5% reporting conflicts at home linked to economic and climate stress. Experts from NSDA and MOLE highlighted that many workers face migration-related issues, with some moving to urban areas without adequate support or housing. This leads to social tensions, increased unemployment, and poor living conditions, which are further exacerbated by inadequate social protection schemes.

An informant from the National Skill Development Authority (NSDA) explained further, *“First is the housing challenge, second is the challenge of income versus expenses, and third is when suddenly any crisis comes, suddenly falls sick, then they don’t have the money or savings to solve that problem.”*

Despite moving for better opportunities, workers face significant barriers upon arrival such as RMG workers struggle most with job access (61.9%), low wages (51.4%), lack of proper housing (12.4%), lack of social support (7.60%), social isolation (9.2%), and communication barriers (10%), particularly among women from rural backgrounds.

In the Leather sector, migration is more unevenly distributed. Noakhali stands out as the single largest contributor, accounting for a striking 35.33% of workers. Other districts play a much smaller role, with Rangpur, Naogaon, and Barishal each contributing 5.33%, followed by Cumilla (4.67%), Faridpur (4.67%), and Bhola (3.33%). Migration also comes from Sirajganj (2.67%), Chandpur (2%), and Kurigram (2%). In terms of housing conditions, 45.3% of workers lived in pucca (concrete-built) houses, considered more durable. Another 42% resided in semi-pucca homes made from mixed materials.

However, 12.7% lived in tin-made structures, which are more vulnerable to environmental and structural risks. This distribution reflects unequal access to secure housing within the tannery workforce. The most common challenge faced by the workers after migration was low wages or discrimination (44.4%). Other major challenges included difficulty in finding work (37.8%), hazardous or unhealthy work environments (28.9%), health problems due to environment or work (25.9%), lack of proper housing (17.8%), and separation from family (11.1%).

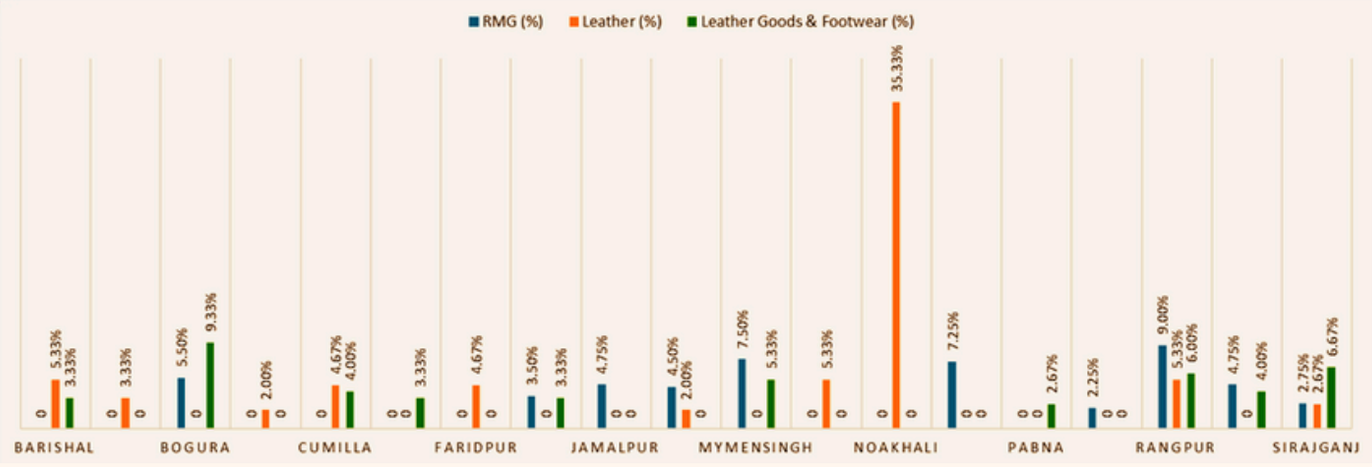
The Leathergoods and Footwear sectors show a more balanced spread compared to Leather sector. Bogura leads with 9.33%, followed by Sirajganj (6.67%) and Rangpur (6.00%). Mymensingh (5.33%) and Cumilla (4.00%) are also significant contributors. Sherpur (4.00%) and Barishal (3.33%) appear prominently, while Dinajpur (3.33%), Gaibandha (3.33%), and Pabna (2.67%) round out the top ten. Housing was split between formal structures (50.7%) and informal settlements (49.3%). Most migrant workers face multiple vulnerabilities post-migration including finding jobs (52%), proper housing (9.40%), social isolation (11.8%), and unsafe working conditions (15%).

Although they have minimal wages, due but due to larger household size, they struggle to survive with this wage. These economic pressures compound these vulnerabilities. Smaller households (≤5 members) made up 80.3% of respondents, while larger households (≥6 members) comprised 19.7%. Families with more members bore greater financial strain when climate-related health and productivity losses reduced earnings. Job loss, wage cuts, and unpaid leave affected workers, reinforcing a cycle of low income and heightened vulnerability. These challenges reflect systemic exclusion and limited integration support for migrant workers, increasing their vulnerability to exploitation and climate shocks.

Table 6: Migration and post-migration challenges

Themes	RMG Sector	Leather Sector	Footwear Sector
Migration and displacement	94.2% of workers were migrants; 10.80% workers reported migration directly due to climatic reasons	91.3% of workers were migrants; 6.6% workers reported migration directly due to climatic reasons	84.7% of workers were migrants; 12.6% reported migration directly driven by climatic reasons
Post-migration challenges	61.9% faced difficulty securing jobs; 51.4% reported low wages; 13.8% unsafe work; 12.4% lack of proper housing; 7.60% with lack of social support; 9.20% felt social isolation; 10% with communication barriers	44.4% faced low wages/discrimination; 37.8% struggled to find jobs; 28.9% unsafe work; 25.9% health problems due to environment or work; 11.1% social isolation; 17.8% lack of proper housing	52% struggled to find employment; 15% unsafe work; 11.8% social isolation; 9.40% lack of proper housing

Figure 4: Workers' Migration Information



4.4 Climate-Induced Disruptions to Livelihoods and Well-Being

At the community level, workers' vulnerabilities are magnified by widespread migration from climate-affected regions, insecure housing, limited sanitation, and weak social networks, all of which erode resilience during climate shocks. Internal migration caused by climate change undermines traditional livelihoods, pushing workers to precarious urban industrial jobs. Workers generally lacks adequate training or resources to adapt to climate impacts such as heat stress and extreme weather. Migration frequently led to family separation and the burden of supporting relatives from afar.

The findings demonstrate that climate change is not only reshaping workplace conditions but also profoundly destabilizing the livelihoods, social well-being, and economic security of workers in the RMG, Leather, Leathergoods and Footwear sectors.. Evidence highlights a growing crisis characterized by climate-induced migration, financial strain, heightened job insecurity, and inadequate social protection. These vulnerabilities disproportionately affect low-income and migrant workers, who face compounded risks due to both structural inequities and environmental shocks.

Workers balanced long hours and household responsibilities, with juggling work and family life. Thus, an FGD participant stated, *"I work for 12-hour days with only a one-hour break, leaving minimal time for her children. Now I am a mother and a wife… I juggle my role at home and in the factory with quiet determination."* In addition to this, there was limited mention of community integration or social support beyond family connections.

Housing Quality and Climate Resilience

Housing remains a critical determinant of climate resilience. Among surveyed workers, 14% in the RMG sector and 12.7% in the leather sector continue to live in tin-shed houses, which are acutely vulnerable to cyclones, heavy rainfall, and extreme heat. In the footwear sector, approximately half of workers reported living in pucca (cement or concrete) structures, suggesting relatively greater but still incomplete protection. Semi-pucca housing remains widespread across sectors, offering only limited resistance to recurrent urban flooding and storm events. Tin and semi-pucca dwellings are highly prone to collapse or severe structural damage during monsoon rains, a recurrent hazard in industrial belts such as Dhaka, Gazipur, Savar, and Keraniganj.

Water Access and Climate Shocks

Access to safe and reliable water sources further underscores sectoral disparities. Pipeline water, the most climate-resilient and secure source, was available to 76% of RMG workers, compared to only 54% of leather workers and 60.7% of footwear workers. The leather sector's reliance on tube wells (46%) exposes workers to heightened risks of arsenic contamination and saline intrusion, particularly in peri-urban and coastal zones such as Savar and Hemayetpur. In the footwear sector, a small proportion (4%) depends on water pumps connected to surface sources, which are prone to depletion during prolonged droughts.

Access to Safe Drinking Water

Access to safe drinking water remains alarmingly low in the leather sector, where only 68% of workers reported

reliable safe water access well below national and international benchmarks. This gap is especially concerning during floods, when unsafe water becomes a critical vector for disease outbreaks. In tannery clusters such as Savar, chemical leaching from industrial waste compounds the risks, contributing to increased incidences of kidney disease and cancers under conditions of recurrent flooding or drought. In contrast, the RMG and footwear sectors perform comparatively better, with approximately 90% of workers reporting safe drinking water access, though climate-induced shocks continue to pose systemic threats.

Sanitation Facilities and Public Health Risks

Sanitation access remains among the most acute vulnerabilities. In the leather sector, only 18.7% of workers reported access to flush toilets connected to sewer lines at the lowest rate across all sectors. A majority 57.3% depend on flush-less pucca toilets, typically dry latrines or poorly maintained septic tanks, which are highly unsanitary and prone to overflow during monsoon rains. In the footwear sector, 5.3% of workers reported practicing open defecation over waterbodies, creating severe environmental and public health risks. While the RMG sector demonstrates relatively higher sanitation access, pit latrines remain common at 32.3%. During seasonal floods, both pit latrines and dry toilets overflow, contaminating residential areas and increasing the incidence of cholera, diarrhea, and typhoid.

Socio-Economic Impacts

Climate change is deepening the socio-economic vulnerabilities of workers in Bangladesh's RMG, leather, and footwear sectors. More than 60% of workers report their households face severe financial strain directly linked to climate disruptions. Nearly half of these families are trapped in debt cycles, and one-third have experienced significant income losses. This is far beyond temporary hardship; it is a systemic impoverishment intensified by climate shocks.

In the RMG sector, 84% of workers acknowledge rising financial burdens, with nearly half 48.3% burdened by debt and over a quarter 28.5% grappling with family conflicts triggered or worsened by economic stress. Wage disruptions are commonplace, with 29.3% facing delayed salaries and 12% enduring unpaid leave or job losses due to climate impacts.

Leather sector workers confront compounded hardships, with 78.7% burdened by soaring living costs, 60% suffering health challenges, and 62.3% grappling with medical expenses. Factory closures affecting one-third of them 33.3% further shrink already scarce employment opportunities, deepening livelihood insecurities. The Leathergoods and Footwear sectors bear the brunt of economic shocks, where over 80% of workers face escalating costs, increased medical burdens, and wage cuts, pushing many toward greater vulnerability.

Climate change thus acts as a heavy, pervasive weight on the economic stability of workers across these sectors, with footwear workers most impacted by wage reductions and leather sector workers suffering from intersecting threats of health crises and job losses. These vulnerabilities threaten the very foundation of workers' livelihoods, demanding urgent attention and targeted intervention.

Job Security in the Face of Climate Change

Job security and working conditions are increasingly undermined by the dual pressures of migration and climate-related disruptions. In the RMG sector, only 17% of workers reported feeling very secure in their jobs due to climate-related issues. In the leather sector, 35.3% of workers reported that climate change had reduced their job security, with raw material shortages and production interruptions cited as recurring challenges. Vulnerability is even more pronounced in the leathergoods and footwear sector, where 32% of workers felt insecure, and an alarming 82% reported wage cuts, unpaid leave, or outright job loss due to climate-induced disruptions.

Table 7: Impact of Climate Change on Workers' Livelihood and Social Life

Themes	RMG Sector	Leather Sector	Footwear Sector
Housing	Pucca: 38.70%, Semi-pucca: 47.50%, Tin: 14.00%	Pucca: 45.3%, Semi-pucca: 42%, Tin: 12.7%	Pucca: 50.7%, Semi-pucca: 49.3%
Water Access	Pipeline: 76%, Tube Well: 23.03% Others: 0.7%	Pipeline: 54%, Tube well: 46%	Pipeline: 60.7%, Tube well: 35.3%, Pump: 4%
Access to Safe Drinking Water	88.30%	68%	90.70%
Sanitation	Flush toilet connected with sewerage line: 63.2%, Pit latrine: 32.3%, Flush less pucca toilet: 4.5%	Flush toilet connected with sewerage line: 18.7%, Pit latrine: 24%, Flush less pucca toilet: 57.3%	Flush toilet connected with sewerage line: 58%, Pit latrine: 36.7%, Hanging over waterbody: 5.3%
Socio-economic Impacts	84% reported increased family financial burden; 48.3% faced increased debt; 28.5% faced family conflicts; 29.3% reported reduced/delayed wages due to climate disruptions; 12% faced wage cuts/unpaid leave/job loss; 14.7% penalized for missing targets	78.7% of workers reported rising costs of essentials; 60% faced family health problems; 17.3% had increased debt; 8.70% faced family conflicts; 62.3% reported higher medical expenses; 58% higher cost of living; 33.3% reduced job opportunities from factory closures	83.3% reported increased costs of essentials; 82.2% had higher medical expenses; 82% experienced wage cuts
Job Security & Working Conditions	17% workers felt insecure due to climate impacts	35.3% of workers felt insecure due to climate impacts	32% of workers felt insecure due to climate impacts

4.4.1 Insights from RMG Sector

The study findings reveal that climate change has significantly affected workers' livelihoods, financial security, and community life. About 29.3% of workers reported that climate change had affected their wages or payment structure through reduced wages or delayed payments, while 70.7% said it had not. Qualitative evidence highlights how extreme weather translates into wage deductions, as one trade union representative explained: *"Wages are definitely deducted. If you're absent, the management usually doesn't consider the reason. They simply deduct attendance-related wages."* A male worker shared a similar experience of being penalized for lateness caused by heavy rain: *"I was 10 minutes late due to heavy rain. They (management) marked me absent and cut my wages. There are many incidents like that."*

These examples illustrate how attendance-related penalties are applied without considering climate-induced disruptions, exacerbating financial strain.

The findings also indicated that 12% of workers experienced wage cuts, unpaid leave, or job loss due to production disruptions, while 88% did not. A female worker reflected on the harshness of production pressures: *"If we (workers) make just two fewer pieces, we have to hear scolding; if we don't complete the target, they'll (management) directly say, 'You (the worker) can leave the job.'"* In fact, 31.3% reported missing their production targets, and among them, 14.7% faced wage cuts. These quantitative and qualitative insights demonstrate how climate-related disruptions make it harder for workers to meet strict production targets, leading to penalties and heightened job insecurity.

Beyond workplace penalties, 70.3% reported that changes in economic conditions had negatively impacted their financial stability and quality of life, with workers citing inflation, reduced wages, and higher living costs. A CSO informant captured this reality: *"People now spend more just to survive the heat on transport, on water and it's all coming out of their daily earnings." Similarly, a Department of Environment (DoE) official raised concerns about structural risks: "Many workers may even lose their jobs due to illness, as factories can't afford long absences. With high-efficiency technologies, machine productivity will increase, but many workers will lose jobs. This will create unrest."*

At the community and household level, about 84% of workers reported increased financial burdens on their families due to climate change. About 48.3% experienced rising debt, while 28.5% reported increased family conflicts. Workers linked these pressures to higher food prices and damaged crops. One FGD participant explained: *"When the market prices of daily goods go up, for example, due to the storm or heavy rainfall, the crops get damaged. So, prices rose, and we had to buy things at a higher cost."* Another worker speculated that "syndicates raise prices after floods or storms." These insights illustrate how climate shocks ripple through markets, straining household budgets and creating social tensions.

Migration emerged as another critical impact. About 37.5% believed climate change had increased worker migration or displacement, while 32.3% were considering migrating or changing jobs due to climate-related pressures. The leading drivers of migration were employment opportunities 88.1%, poverty 56.3%, and natural disasters 10.8%. A mid-level manager observed: "People who live in riverine areas or places that are frequently flooded have no choice but to migrate. If their houses are destroyed or they lose their land, they come and migrate here (Dhaka city)." Another informant shared a personal account *"If I could have had three meals a day in my village, I wouldn't have come to Dhaka to pull a rickshaw, work in a garments factory. When a worker cannot survive in their own village… ultimately, in search of food, they are forced to leave their home."*

However, migrant workers face significant challenges in urban areas. About 61.9% cited difficulty securing jobs, 51.4% reported low wages, while smaller portions mentioned unsafe working conditions 13.8%, lack of housing 12.4%, health issues 8.6%, social isolation 9.2%, and communication barriers 10%. A worker explained the cycle of hardship: *"Since our house becomes too hot and has water issues, we are planning to leave after Eid. Despite migrating from the village for work, we're still in debt." A mid-level manager added: "When they (workers) come to Dhaka, they are desperate. They have nothing left, and the work they find is often poorly paid, with long hours, and exhausting. They live in cramped rooms with no privacy, sometimes without proper sanitation. They came here for a better life, but it's a constant struggle."* Experts from NSDA, DoE, and the Department of Social Welfare emphasized how migrants often lack documentation, housing, and social protection, leaving them vulnerable and excluded from essential services.

Job security is another pressing concern. About 17% felt at risk due to climate-related complexities. A key informant described: *"There's heavy rain in Baipail (located in Savar), the bus is stuck, and the worker can't go to work on time. The factory might accept that for a day or two, but after that, they won't care why you're late daily." Workers feared dismissal if production targets were missed due to heat or illness. As one informant noted "When heat waves hit, absenteeism increases. Targets are missed. Owners lose money. Workers lose wages. Everyone is impacted."*

Taken together, these findings underscore that climate change not only disrupts workers' wages, job security, and production performance, but also heightens household debt, family conflicts, and migration pressures. Migrant workers, in particular, face unsafe housing, low wages, and

exclusion from social protection, reflecting systemic vulnerabilities. Addressing these challenges requires more flexible workplace policies, stronger social protection schemes, and targeted support for climate affected and migrant workers to safeguard both livelihoods and community well-being.

4.4.2 Insights from Leather Sector

The study findings reveal that climate change has placed significant pressure on the livelihoods, job security, and social well-being of leather workers. A majority of respondents reported that income stability was directly affected: 62.3% attributed financial strain to rising medical expenses linked to work-related illnesses, while 58% pointed to higher living costs driven by climate-related disruptions. Additionally, 33.3% experienced reduced job opportunities due to temporary factory closures. One FGD participant summed up the situation *"Besides, if there's no production, there's no work. And if there's no work, what do we eat?"*

Climate change has also disrupted production processes, with 39.3% of workers reporting direct impacts on factory operations. Qualitative insights revealed that extreme heat and water scarcity reduced leather quality, increased waste, and drove up production costs. As one leather worker explained: *"The temperature has risen so much that it exceeds records, going above 40 degrees. The water supply for production capacity from the CETP hasn't met our needs in the past few years. This has caused huge financial losses for our company."* A CSO representative confirmed that higher preservation costs under extreme heat put Bangladeshi tanneries at a competitive disadvantage internationally. A production manager added that climate-induced absenteeism also inflates costs: *"Suppose you have 10 workers and they could finish a task in one day. Now, if two workers are absent, part of the work remains unfinished… so obviously, the production cost increases."*

Market access is another major concern. A trade union leader explained: *"We are not getting the Leather Working Group (LWG) certification. We have no compliance, so big brands are not buying leather from us… This impacts our leather business."* The lack of environmental compliance combined with climate vulnerabilities, restricts exports and reduces income security for both owners and workers.

In terms of support, workers most frequently demanded higher wages 72%, a safe work environment 67.3%, and access to health insurance 61.3%, with 42% calling for climate adaptation training. However, 75.4% reported not receiving any support from brands. Among those who did, medical assistance 69.3%, protective equipment 53.3%, compensation for health impacts 49.3%, and risk allowances 44.7% were the most cited. Many workers also called for investment in eco-friendly technologies 41.3% and greater transparency about environmental standards 20%.

Job security emerged as a pressing concern: 35.3% believed climate change reduced their job security. Workers described how climate-related illnesses and absenteeism led to wage deductions and termination threats. One worker shared: *"If I fall ill, I can't come to work… If I'm absent because of these issues, the company deducts my salary. If this continues, there's a risk they might fire me."* Non-unionized and contract workers were identified as particularly vulnerable, as one informant noted *"Every day, every moment, they fear losing their jobs. Owners don't hire permanently. They can just terminate someone whenever they feel like it."*

Migration plays a central role in the sector, with 91.3% of workers being migrants. The main reasons included seeking better wages and working conditions 61%, lack of employment opportunities in home areas 43.4%, poverty 34.6%, and family-related reasons 20.6%. Climate-induced displacement also featured, as workers described losing homes and land to floods and river erosion: *"The river flooded my village. That's why I had to come here for work," said one male worker. Another added, "Every time I go back, erosion is eating it up."*

Yet, migration brought new challenges. The most common difficulties were low wages or discrimination 44.4%, difficulty finding work 37.8%, hazardous conditions 28.9%, health problems 25.9%, and poor housing 17.8%. Qualitative insights emphasized the housing crisis near tannery zones. A leather manager observed *"There's very little decent accommodation nearby. Since tanneries are polluting areas, the nearby houses are also affected… but rent is extremely high near the tanneries. Based on their salary, many can't afford it." Migrants also faced higher living costs compared to locals. As one CSO informant explained: "Locals might have access to land to grow vegetables or raise poultry. Migrants from rural areas don't have these options they have to bear all living expenses without supplementary sources of income."*

Adaptation was particularly difficult for new entrants. A CSO representative noted: *"For those who come as migrant workers, adaptation is a major challenge… in the tannery, it's a confined space with many chemicals and solutions involved in the work. The level of adaptation needed is very high, and not everyone can manage that."*

Beyond work, climate change also strained family and community life. Workers most frequently reported increased cost of essentials 78.7% and rising health problems among family members 60%, followed by increased debt 17.3% and family conflict 8.7%. Only 14% reported no significant impact. Community-level responses were limited: 64% believed no collective action had been taken to address climate change, while 85.3% stated there were no social security benefits in place.

Together, these findings illustrate how climate change undermines both workplace productivity and community well-being in the leather sector. Rising costs, job insecurity, migration pressures, unsafe housing, and the near-absence of social protection create a cycle of vulnerability for workers already operating in hazardous conditions. Addressing these intertwined challenges requires systemic reforms that strengthen compliance, brand accountability, expanded social protection, and targeted adaptation measures to safeguard the livelihoods and dignity of leather workers in a climate-stressed future.

4.4.3 Insights from Leathergoods & Footwear Sector

The footwear sector is increasingly vulnerable to climate-related disruptions that affect both income security and social well-being. Nearly 47.3% of workers reported that extreme heat or irregular rainfall had negatively affected their income or productivity, while 48% saw no impact. Vulnerability appeared to vary depending on job type, worksite ventilation, and exposure to heat. Among those affected, 82.2% cited rising medical expenses, 32.9% noted fewer job opportunities, and 1.4% reported higher commuting costs, underscoring how climate stress adds to the financial burden of low-income workers.

Job instability emerged as a critical issue 82% of respondents experienced wage cuts, unpaid leave, or job loss due to climate-related disruptions. Regarding overall security, 32% felt climate impacts contributed to job insecurity, 14% disagreed, while a majority 54% were unsure reflecting either lack of awareness or reluctance to speak out, and highlighting the need for clearer workplace communication on climate risks.

Climate change also affects workers' households and community life. A vast majority 83.3% of them reported rising costs of essentials such as food, water, and electricity, while 32.7% reported more family health problems and 6% mentioned the risk of displacement. Only 16% felt unaffected, showing how climate-related stress is increasingly shaping socio-economic conditions. At the community level, 64% observed no climate adaptation measures, and only 14.7% noted independent efforts, pointing to weak institutional engagement in vulnerable areas.

Migration is strongly tied to these pressures. The leading drivers were lack of job opportunities 67.7%, poverty 60.6%, and seeking better wages or working conditions 58.3%. A smaller share 6.3% cited direct climate-related factors such as land loss or disaster displacement. However, migration rarely eased workers' hardships: 52% reported difficulty finding employment after relocating, while others faced unsafe working conditions 15% and social challenges such as family separation or isolation 11.8%.

Union participation was also found to be weak only 20.7% of workers were union members, while 79.3% were not. The main barriers included lack of information 44%, management opposition 38.8%, fear of retaliation 8.6%, and disinterest 26.4%. Even where unions existed, 60.7% of workers said unions lacked climate awareness, 32.7% cited weak bargaining power, and 26.7% noted resource shortages. This gap limits workers' collective voice in addressing climate-related risks and advocating for workplace adaptation measures. Perceptions of workplace climate safety were split 42.7% felt climate risks were being addressed, 40% disagreed, and 17.3% were unsure.

Overall, these findings show that climate change is compounding vulnerabilities in the footwear sector by raising household costs, driving migration, fuelling job instability, and exposing gaps in social protection and worker representation. Strengthening factory-level climate preparedness, expanding social protection schemes, and building union capacity for climate-responsive advocacy are critical steps to protect workers in this industry.

4.5 Climate-Induced Disruptions to Workers' Productivity

This section shows that climate change is already disrupting working conditions and productivity in the RMG, leather, and footwear sectors, with extreme heat, poor ventilation, waterlogging, and chemical exposure emerging as key stressors.

A recent study reported that about 50% of garment workers face adverse effects from extreme heat, floods, cyclones, and waterlogging that lead to higher absenteeism, reduced productivity, and lower income (BILS, 2025).

The nature, intensity, and perception of these impacts vary across sectors, but the consequences are interconnected. Climate change directly reduces workers' productivity due to extreme heat and absenteeism, which immediately affects factory output. Declining production then weakens overall industry performance, with ripple effects on the economy. These disruptions ultimately translate into increased medical costs, reduced wages, lower food security, and limited access to basic necessities for workers and their families. In this way, climate change affects workers both directly through health and productivity losses and indirectly through economic strain and reduced living standards.

Exposure to Extreme Heat

According to the Global Labour Institute of Cornell University, found that cities like Dhaka, Hanoi, Ho Chi Minh City, Phnom Penh and Karachi, the number of days with "wet-bulb" temperatures - a measurement that accounts for air temperature as well as humidity - above 30.5 degrees Celsius jumped by 42% in 2020-2024 compared to 2005-2009. Extreme heat and flooding could erase $65 billion in apparel export earnings from Bangladesh, Cambodia, Pakistan and Vietnam by 2030 (Reid & Reid, 2024).

Alarmingly, all three sectors face severe heat stress, but mitigation infrastructure is lacking, especially in leather and smaller footwear units. In general, approximately 82.1% of workers across the RMG, Leather, and Footwear sectors in Bangladesh experience heat stress as a significant workplace issue, reflecting a systemic and widespread climate-related hazard. While RMG (87%), Leather (79.3%), and Footwear (72%) all report high levels of heat stress, particularly in poorly ventilated factory floors. Despite lower percentages in leather and footwear, the combined effect of ambient heat and chemical reactions in tanneries amplifies health risks.

In the RMG sector, heat exposure was most frequently reported in the sewing section (62.25%), followed by packing (15.5%) and finishing (7.5%), reflecting the vulnerability of densely populated, poorly ventilated workspaces.

The majority of workers (59.3%) are engaged in sewing, a repetitive, seated task that exacerbates heat stress and musculoskeletal disorders during extreme temperatures. Moreover, 26.25% of workers reported that heat negatively affected their wages, indicating potential links between thermal stress, reduced productivity, and absenteeism, while 60.75% experienced heat without payment impact, and 9% reported no effect.

In the Leather sector, exposure and climate-induced impacts vary across work sections. Chemical handling shows minimal disruption, with 2.7% somewhat affected and 1.33% not affected. In contrast, the Crust or Finishing phase displays higher vulnerability, with 2.67% greatly affected, 15.33% affected, and 20% reporting no impact, likely due to heat-intensive processes requiring manual intervention. The sector's workforce is more diversified, with 38% in crust/finishing, 15.3% in tanning, and 14% in maintenance. Workers in beamhouse and tanning sections face direct exposure to toxic chemicals (e.g., chromium, acids) and high heat, increasing health risks under climate stress.

In the Footwear sector, heat exposure is most prevalent in cutting (87%) and lasting (86.2%), followed by sewing (79.4%). Key roles include sewing (44.7%), lasting (17.3%), and cutting (14.7%), which involve prolonged standing and physical strain, exacerbated by rising indoor temperatures, poor ventilation, proximity to heat-generating machinery, and inadequate rest facilities.

Poor Cooling and Ventilation System

In general, only 50% report adequate cooling system (e.g., fans, exhaust systems, ventilation, misting) including RMG 52.3%, Leather 43.3%, and footwear 49.7%. Cooling measures are severely insufficient across all sectors even were reported as *"yes,"* they are often mechanical, passive, and ineffective under Bangladesh's extreme heat-humidity conditions (Wet Bulb Globe Temperature often exceeds 32°C unsafe for labour). On the other hand, over one-third of workers have NO cooling system highlighting underinvestment in climate-resilient workplaces. In this case, an FGD participant outlined, *"The factory has no proper ventilation, and the heat inside is intense. The air doesn't circulate properly, and it makes us feel tired and sick." While another participant highlighted, "We have fans, but it's still extremely hot. The air doesn't circulate properly, and it makes us feel tired and dehydrated…. The finishing work is done next to the boiler, and the steam increases the heat. It feels like the temperature is 40-47°C instead of 30°C."*

On the other hand, chemical exposure in the Leather, Leathergoods and Footwear sectors are severe during the hot and humid environment, and combinedly more than 50% of the workers are affected including (32% in leather and 20.2% in footwear) since heat increases chemical volatility and skin absorption posing serious occupational health risks. In this case, an FGD participant uttered, *"When you handle salt-coated raw skins, you get skin rashes and allergies. The heat makes it worse. Sweat mixing with chemicals worsens the itching."*

Perceived Impact of Climate Change on Productivity

Climate stressors, particularly heat, interact with rigid production targets to undermine productivity. About 60% of the workers from all sectors stated that climate change causes to reduced productivity. In this case, Footwear sector reports the highest perceived impact while 64% mentioned climate change affects productivity, followed by RMG (58.3%) and Leather (39.3%). From the qualitative findings, it is explored that heat directly reduces workers' capacity to maintain high speeds. A statement from Rina's Story (RMG), *"When you're tired, hungry, and overheated, it takes a toll on your body... it's hard to work for 10 hours straight. In addition, When the heat is intense, you can't always take a break when you need to. You just have to push through." While an FGD participant explained, "The target is 200 pieces per hour, and if we don't meet it, we're looked down upon. If the machine is down, it's still counted as your time… you have to make up for it."*

So, it is observed that production pressures are high, with fixed and demanding targets contributing to worker stress. However, disruptions are widespread in the RMG sector with 17.9% of workers highly affected and over half (51.6%) moderately affected, indicating significant challenges to maintaining output. The leather sector shows a mixed picture while 6% report greatly decreased productivity and 46.7% somewhat decreased, nearly half (47.3%) report no effect, reflecting uneven impacts across workplaces. In contrast, the footwear sector appears comparatively resilient, with only 2.7% facing major impacts and 21.3% minor impacts, while the majority (63.3%) report no disruption. Overall, RMG is the most heavily burdened, leather faces partial yet uneven disruptions, and footwear remains the least affected in terms of productivity.

Climate-Induced Production Disruptions

From the general view, the highest overall disruption is increased absenteeism 39.9%, followed closely by raw material disruptions 18% and missed production targets 17.8%. These are not minor inconveniences, they are systemic threats to export reliability, factory profitability, and worker income stability.

The RMG sector faces key disruptions, including higher absenteeism 37%, production delays 23.5%, increased cooling costs 15.3% and nearly 43% reported no impact, possibly due to better infrastructure in export-oriented units. The sector faces heat-related productivity issues, delays, and elevated operational costs due to climate change. While the Leather sector reported raw material quality decline 64.2%, delayed raw material supplies 62.7%, increased absenteeism 43.3%, and frequent machine breakdowns 20.9% due to humidity and power fluctuations. In addition to this, workers face failure to meet production targets 17.3% and reduced working hours 25.3% due to climate impacts. Physical health challenges also surface with illness and painful work experience 1.4% and increased workload 18%. So, the leather sector struggles with disrupted workflows and raw material supply chains aggravated by climate stress. On the other hand, the Leathergoods and Footwear sector shows decreased worker efficiency 89.2% the highest across sectors, increased absenteeism 44.1%, work-related injuries/illnesses 41.9% and reduced working hours 29% due to heat fatigue. The sector is vulnerable to worker health and efficiency losses possibly linked to heat and environmental hazards. It is observed that the leather sector faces systemic climate risks while it suffers from climate-induced supply chain and raw material instability, threatening long-term viability. On the other hand, footwear workers report the highest efficiency loss, indicating high sensitivity to environmental conditions and possibly poor adaptive capacity.

Absenteeism is widespread ranging from 37% (RMG) to 44.1% (Footwear), heat-related illness and discomfort are directly affecting labour availability. While footwear workers clearly recognize climate impacts, leather workers underreport disruptions, possibly due to normalization of hardship or fear of job loss.

On the other hand, waterlogging in Bangladesh significantly disrupts workers by hindering their commute, causing income loss, creating financial costs for alternative transport, and increasing health risks due to waterborne diseases and poor living conditions. For the urban poor, the combined impact is severe, as their homes are often in low-lying, flood-prone areas, sometimes serving as their workplace, making them particularly vulnerable to the economic and social fallout of waterlogged streets.

The study found that waterlogging due to heavy rain affects 52% of leather factories, primarily located in low-lying areas like Hemayetpur, compared to 18% in footwear and unreported in RMG. Water shortages disrupt 6% of leather and 0.7% of footwear units, threatening water-intensive tanning and dyeing processes. Critically, 64.2% of leather workers reported decline in raw material quality, and 62.7% faced supply delays linked to climate impacts on livestock and transportation.

Table 8: Climate Change Impacts on Workers' Productivity

Dimension	RMG Sector	Leather Sector	Footwear Sector
Climate related issues on Work	Extreme heat exposure: 87% Poor air quality & ventilation: 47.8% Waterlogging due to heavy rain: 25.6%	Extreme heat exposure: 79.3% Poor air quality & ventilation: 46% Waterlogging due to heavy rain: 52% Increased exposure to hazardous chemicals due to heat/humidity: 32% Production disruption due to water shortage: 6%	Extreme heat exposure: 72% Poor air quality & ventilation: 34% Waterlog due to heavy rain: 18% Increased exposure to toxic chemicals due to heat/humidity: 20.2% Water shortages affecting production: 0.7%
Sections by heat exposure	Sewing: 62.25%; Packing:15.5%; Finishing: 7.5%	Leather cutting & design 100%, Chemical handling 83.3%, Tanning 82.6%, Crust/finishing section 77.2%	Cutting: 87%; Lasting: 86.2%; Sewing: 79.4%
Cooling and comfort measures	Yes: 52.3% No: 42% Not sure: 5.8%	Yes: 43.3% Inadequate: 34.7% No: 22%	Yes: 49.7% Inadequate: 34.3% No: 16%
Climate change impact on productivity	Yes: 58.3% No: 38.7% Not sure: 3%	Yes: 39.3% No: 33.3% Not sure: 27.4%	Yes: 64% No: 13.3% Not sure: 2.7%
Degree of impact faced on productivity	Highly affected:17.9% Moderately affected: 51.6% Less affected: 30.5%	Greatly decreased: 6% Somewhat decreased: 46.7% No effect: 47.3%	Major impact: 2.7% Minor impact: 21.3% No disruption: 63.3%
Production process disruptions	Production delays 23.50%, Machinery damage 10.80%, Increased cooling costs 15.30%, No impact 42.80%, Don't know 0.80%	Decreased productivity 46.7%, Failure to meet production target 17.3%, Reduced working hours 25.3%, Illness & painful work experience 1.4%, Increased workload 18%, Decrease in the quality of raw materials 64.2%, Delay in supply of raw materials 62.7%, Frequent breakdown of the machine 20.9%, No impact 34%	Decreased worker efficiency 89.2%, Raw materials availability 20.70%, Increased work-related injuries/illnesses 41.9%, Reduced working hours by 29%, Missed production target 3.20%
Absenteeism	increased absenteeism 37%	Increase absenteeism 43.3%	Increased absenteeism 44.1%

4.5.1 Insights from RMG Sector

The study revealed that the majority of RMG workers are increasingly vulnerable to the impacts of climate change, particularly extreme heat. Quantitative findings showed that 87% of workers reported an increase in extreme heat days at their workplace, a concern strongly echoed in the qualitative data. A civil society informant vividly described the oppressive conditions, noting, "The working environment in our RMG factories becomes extremely hot… when it's 34–35°C outside, it gets even worse inside with all the boilers and irons running." Similarly, a female worker stressed that the heat is a persistent challenge rather than a seasonal one, remarking, "It's always hot in garments. In winter, we (workers) don't even wear sweaters because it (workplace) stays hot." A mid-level manager further reinforced this discomfort, stating, "We're getting extremely uncomfortable in the heat, sweating a lot." Together, these insights highlight the constant and intensifying problem of workplace heat exposure, worsened by machinery and inadequate ventilation.

"The factory has no proper ventilation, and the heat inside is intense. The air doesn't circulate properly, and it makes us feel tired and sick. During the summer, you won't find a day when 2-3 girls do not get fainted and are taken to the factory's emergency care center." — (Rina, RMG, Case Story)

"If you didn't meet your target, you weren't considered good enough and the pressure to produce never let up, whether he was supervising or working on the floor. Workers are expected to produce 200 pieces per hour, with no room for breaks. Even if I felt thirsty, I couldn't go to drink water because the pressure to meet targets was always there."— (Nadia, RMG, Case Story)

Concerns about deteriorating indoor air quality were also raised, with 47.8% of workers reporting changes, while 44% noticed no difference-suggesting varied experiences across factory settings. When asked about comfort during hot weather, 52.3% of workers felt comfortable, but 42% reported discomfort, with qualitative evidence underscoring the shortcomings of existing cooling methods. A female worker explained, "The fans blow hot air in the working areas… standing under those (fans) makes the condition worse, and skin burns. It's (work environment) uncomfortable, but still, we have to work like that, even if it's difficult." Another CSO informant confirmed the extreme toll of heat, recounting,

"During peak summer, the factory floor becomes unbearable. We've had workers fainting from the heat. They sweat excessively and complain of dizziness. Even with fans running, the temperature feels suffocating." These accounts reflect the inadequacy of current ventilation and cooling strategies, with workers facing serious health risks, including fainting and heat stress.

Health impacts emerged as a particularly critical theme, with 65.5% of workers reporting increased illness during extreme heat.Thus, it leads to absenteeism while 37% of the workers reported it. The qualitative testimonies reinforced this, as one male worker shared, *"I was extremely exhausted and kept vomiting, eventually fell sick while working during hot days."* A mid-level manager echoed this sentiment, acknowledging that the situation overwhelms even modern cooling systems, stating, *"The temperature is such that even Air Conditioners (ACs) aren't effective. There are a lot of problems (e.g., increased fatigue, sweating, illness, inability to work) - the heat makes us restless."* Collectively, these findings demonstrate that extreme heat not only undermines workplace comfort but also directly jeopardizes worker health, productivity, and well-being, underscoring an urgent need for climate adaptation measures and improved occupational safety interventions in the RMG sector.

4.5.2 Insights from Leather Sector

The Leather sector is facing significant climate-induced challenges, with increased indoor temperature emerging as the most reported issue 79.3%, leading to widespread discomfort and reluctance among workers to use personal protective equipment (PPE), as 74.7% stated they avoided wearing masks, gloves, or boots. Waterlogging from heavy rainfall 52% and poor air quality or ventilation 46% were also major concerns, while 32% highlighted heightened chemical exposure due to heat and humidity, and 6% mentioned disruptions from water shortages. Only a small minority (4.7%) reported no issues, with 2% unsure, pointing to knowledge gaps. Qualitative data strongly reinforced these findings, with workers describing unbearable heat and its direct effect on productivity. One worker shared, "The rising temperatures are making it difficult to work. I sweat a lot, and sometimes I can't complete tasks on time." A compliance officer added, *"When temperature rise by one or two degrees Celsius due to climate change, it further increases the heat in tannery processes, harming workers and negatively affecting the sector."*

Extreme heat has also shortened the window for preserving raw hides, leading to spoilage: *"If salt is not applied within 4–5 hours, the hide gets spoiled. So, this is a major problem."* Rising humidity worsens conditions, as an assistant manager explained: *"The air is getting hotter day by day. Humidity is also rising, creating an uncomfortable situation inside the tannery."* These accounts illustrate a cycle where climate change intensifies workplace hazards, leading to physical exhaustion, discomfort, and declining productivity, ultimately affecting both workers' health and product quality.

Gender-based findings revealed nuanced differences in climate-related impacts. Among male workers, 6% reported significantly decreased performance and 41.33% somewhat decreased performance, reflecting their assignment to physically demanding, high-exposure roles in tanning, chemical handling, and beamhouse operations. In contrast, while no female workers reported severe decline, 5.33% experienced moderate disruptions and only 12% remained unaffected, indicating subtle but persistent effects such as ergonomic discomfort in packaging areas, fatigue in enclosed spaces, and psychosocial strain from balancing domestic duties during extreme weather events. This underscores a dual-layered burden of climate change shaped by gendered roles, physical exposure, and social factors, highlighting the need for adaptive labour strategies that prioritize both efficiency and worker well-being.

Climate stressors have also led to significant productivity declines and operational disruptions. Nearly 46.7% of workers reported decreased productivity, 25.3% experienced reduced working hours, and 18% noted increased workloads, with 17.3% citing missed production targets. Workers linked these outcomes to heat-induced fatigue and dehydration. A civil society representative emphasized, *"This (climate-induced extreme heat) causes discomfort in both their health and working environment, and the speed of their work decreases. Ultimately, it hits production."* Heat also reduces motivation, slowing essential processes like waste management, as a leather employer noted, *"When the temperature is high… Instead of washing the effluent mesh every hour, workers will do it every two or three hours… That affects efficiency."* Although 34% of workers claimed weather had no impact, expert accounts warned of rising production costs, including raw hide preservation expenses, further straining the sector.

Workplace infrastructure plays a key role in these challenges. While 43.3% of workers reported some cooling systems, 34.7% found them inadequate and 22% said there were none, reflecting the sector's lack of climate-resilient design. Many factories suffer from poor ventilation, weak thermal insulation, and dust intrusion, leaving workers exposed to both summer heat and winter cold. As a trade union leader observed: "*There is very unpredictable weather. However, the structure in our tannery industry is not made that way… it will be extremely hot in summer and cold in winter."* Such poor infrastructure amplifies workers' discomfort, health risks, and task inefficiencies throughout the year.

The production process itself is deeply affected by climate change. About 39.3% of respondents reported production process disruptions, with qualitative data citing increased costs for additional cooling and ventilation. One compliance officer shared, *"Yes, production costs do go up… We used to use one fan, but now we need to use three… Excessive heat causes raw hides to spoil."* Others described rainy-season challenges: *"If hides get wet with rainwater, they spoil quickly. As a result, our costs go up."* Workers also highlighted that extreme heat alters leather texture, causing hardening, water wastage, and salting issues: *"The materials are drying up more than necessary… buyers are facing difficulties too."* Focus group discussions confirmed this pattern, warning, *"Due to excessive heat, the goods start to decay, and the leather temper gets ruined."* These disruptions increase costs, waste, and spoilage, jeopardising product quality and profitability.

Quantitative findings further demonstrate the breadth of climate-induced disruptions: 64.2% of workers observed decreased raw material quality, 62.7% cited supply delays, 43.3% reported absenteeism, and 20.9% noted frequent machinery breakdowns. Qualitative interviews added environmental risks, with a compliance officer reporting, "During heavy rain, various waste materials like trimmings, shavings, and chemically mixed wastewater overflow… flowing into nearby rivers, resulting in water pollution." Together, these findings reveal an interconnected cycle where climate change drives heat stress, health hazards, infrastructure vulnerabilities, raw material spoilage, and environmental degradation, threatening both worker well-being and the sustainability of the leather industry.

4.5.3 Insights from Leathergoods & Footwear Sector

Climate change is increasingly affecting the footwear sector, A vast majority of workers (84%) report experiencing negative impacts, with extreme heat being the most pervasive and disruptive factor. Extreme heat exposure is the paramount climate-related issue, directly affecting 72% of workers. This is further emphasized by the fact that sections involving intense physical labor or proximity to machinery (Cutting at 87% and Lasting at 86.2%) are the most severely affected.

Despite the high prevalence of heat, cooling and comfort measures are insufficient. While nearly half (49.7%) have some form of mitigation, over half of the remaining responses indicate these measures are either inadequate (34.3%) or completely absent (16%), leaving a large portion of the workforce vulnerable.

The impact on productivity is near-universal. An overwhelming 89.2% of respondents identify decreased worker efficiency as a direct consequence of climate change, which is the primary driver behind the 84% who confirm an overall negative impact on productivity.

The disruption is primarily felt through reduced human performance rather than supply chain issues. While raw material availability is a concern for some (20.7%), the major disruptions are decreased work efficiency (89.2%), increased work-related injuries/illnesses (41.9%), reduced working hours (29%), and increased absenteeism (44.1%).

Although the impact is widely acknowledged, its perceived severity varies. A significant majority (63.3%) report no disruption, while 21.3% feel a minor impact, and only 2.7% report a major impact. This suggests that while the frequency of impact is high (affecting efficiency daily), the severity may not be catastrophic for most, possibly due to adaptation or normalization of harsh conditions. Beyond heat, other climate issues contribute to the problem. Poor air quality and ventilation (34%) exacerbate the discomfort, while increased exposure to toxic chemicals due to humidity (20.2%) presents a serious occupational health hazard. Water shortages, though less frequent (0.7%), can still halt production.

The leather and footwear sector faces a critical challenge from climate change, primarily driven by extreme heat. This leads to widespread decreases in worker efficiency, increased health risks, and higher absenteeism.

The current cooling infrastructure is inadequate, failing to protect a large segment of the workforce. While many do not perceive the disruption as “major,” the cumulative effect of reduced efficiency across the sector likely results in substantial economic losses and compromised worker well-being. Addressing this requires urgent investment in effective workplace cooling, improved ventilation, and comprehensive heat stress management programs.

4.6 Climate-Induced Impacts on Workers' Health

The study presented in this section reveal a severe and multi-dimensional health crisis across the RMG, Leather, and Footwear sectors in Bangladesh, driven by escalating climate change impacts particularly extreme heat, poor working conditions, and systemic neglect of occupational health. Workers are experiencing widespread physical, mental, and reproductive health challenges, with limited access to healthcare, inadequate sick leave, and dangerous coping mechanisms such as avoiding water intake.

Heat Stress & Fatigue

Heat stress is one of the most pervasive climate-induced health risks across the RMG, Leather, Leathergoods and Footwear sectors sectors. More than half of workers (53.4%) report suffering from excessive heat stress or fatigue, while 36% experience dizziness or dehydration symptoms directly linked to rising ambient temperatures and inadequate workplace cooling systems. A concerning 2.3% have suffered heatstroke, a medical emergency that often remains unrecognized or untreated in these settings.

In the RMG sector, heat-related illness is acute, with 73.3% of workers feeling unwell due to extreme heat. Among them, dizziness 54.3%, dehydration 52.5%, and heat stress 46.6% among women are common. While Leather sector shows approximately 48.7% report heat stress or fatigue, while two-thirds 66.7% experience dehydration, reflecting restricted water intake due to unsanitary or unsafe toilets. On the other hand, Footwear sector indicates the highest prevalence of fatigue 60.7% was recorded, though dizziness 23.3% and dehydration 16.7% were less frequently reported compared to other sectors.

RMG workers face the broadest spectrum of symptoms, while footwear workers endure the highest fatigue and leather workers face the severest dehydration risks each sector bearing distinct facets of climate-induced physical strain.

Physical Health Problems

Climate change interacts with hazardous workplace conditions to exacerbate physical illnesses. Nearly half of all workers (48.6%) experience chronic headaches, likely driven by heat-induced tension, dehydration, and inadequate ventilation. Leather workers are particularly vulnerable, with 40% reporting skin diseases due to the combined effects of chemical exposure and excessive sweating. Respiratory illnesses affect almost one in five workers, especially in the leather sector, where toxic fumes (e.g., formaldehyde, solvents) are trapped in poorly ventilated spaces. Eye irritation, affecting around 10% of workers overall, is also concentrated in tanneries.

In the RMG sector, health issues are dominated by headaches 54%, skin problems 23%, and respiratory difficulties 16%. Regarding the Leather sector, the most severe issues including chronic headaches 52%, skin diseases 40%, respiratory illnesses 31.3%, and eye irritation 30.7% are widespread, likely linked to chemical exposure and poor ventilation. On the other hand, Footwear sector shows comparatively lower prevalence but headaches 30.7%, skin issues 26.7%, eye irritation 16%, and respiratory problems 9.3%.

The evidence clearly identifies the leather sector as the most hazardous for physical health, owing to its combined climate and chemical risks.

Mental Health Impacts

Psychological strain is an often overlooked but critical dimension of climate vulnerability. More than 55% of workers report significant mental health impacts placing these rates among the highest globally in industrial labor contexts. Stress and anxiety affect nearly one in three workers, while nearly a quarter report sleep disturbances due to physical pain, economic stress, and fear of workplace retaliation.

It is found that RMG workers experience mental health impacts about 54.5%, reporting stress/anxiety (21.3%) and sleep disturbances (28.7%). While about 53.3% Leather workers also reported mental health concerns, citing stress and illness-related pressure. On the other hand, Footwear workers are the most severely impacted, and 58.7% reported mental health issues, with extremely high anxiety/stress (86.8%) and low morale (49.5%) linked to job insecurity, wage cuts, and poor conditions.

Mental health challenges are pervasive, but footwear sector workers face the most acute psychological strain, reflecting deep job insecurity and social stress linked to climate impacts.

Reproductive Health Risks (Female Workers)

Reproductive health is an under-researched but highly vulnerable area. One in four female workers experiences menstrual irregularities linked to chronic heat exposure, malnutrition, and chemical contact. One in six faces miscarriage risks, and one in ten suffers pregnancy complications. Infertility 7% often tied to prolonged exposure to endocrine-disrupting chemicals (e.g., chromium, solvents and heat stress) emerging as a silent epidemic.

In the RMG sector, it is found that a significant concern reported menstrual irregularities 26.4%, miscarriages 16.7%, and pregnancy complications 9.6%. While the Leather sector shows the highest reproductive risks including menstrual irregularities 26.4%, miscarriage risk 19%, infertility 14.3%, and pregnancy complications 9.5%. On the other hand, Footwear sector highlights the substantial concerns regarding menstrual irregularities 24.2%, pregnancy complications 13.6%, and miscarriage risk 10.6%.

Reproductive health is most severely threatened in the leather sector, likely due to combined exposure to heat stress and workplace chemicals.

Access to Health Services

Access to workplace health services varies substantially across sectors, exacerbating inequalities in climate vulnerability.

The RMG sector shows the best access in terms of workplaces has health facilities 88.5%, though only a small proportion 6.8% are within close walking distance (<1 km). While Leather sector points the extremely deprived where only 23% workplaces have health facilities, with most located 1–3 km away 57%, creating major barriers to timely care. On the other hand, Footwear sector highlights better than leather, with 76% workplaces having health services, and 64.7% are within 1 km.

Leather sector workers face the most limited health service access, worsening the burden of illness, while RMG workers benefit from more structured workplace health support.

Restricting Water Intake to Avoid Unsafe Toilets

Over one in four workers deliberately reduce water consumption to avoid unsafe, overcrowded, or distant toilets, directly increasing risks of dehydration, kidney strain, heatstroke, and urinary infections.In the RMG sector, about 23.8% avoid drinking water to reduce toilet visits, and often due to shared, unhygienic, or distant toilets. While, Leather sector shows that about 40% avoid drinking water, which is the highest rate due to lack of private sanitation, unhygienic or chemical-contaminated toilets and strict production targets. On the other hand, Footwear sector notes that about 21.3% avoid drinking, indicating similar pressures. This dangerous behaviour directly contributes to dehydration, kidney strain, and heatstroke, and reflects a dehumanizing work discipline.

Financial Burden of Climate-Related Illness

Climate-linked health conditions impose a heavy financial toll. Over two-thirds 66% of workers spend BDT 500 or more monthly on illness-related costs equivalent to 30–50% of net income. In the leather sector, nearly one-third of 29.3% spend over BDT 3,000 monthly more than twice the average daily wage forcing households into debt, asset sales, or reduced food consumption. the RMG sector, it is seen that medical costs are relatively modest but still burdensome with 22.3% spending BDT 200–500/month, while 26.3% exceed BDT 1,000. While Leather sector shows higher financial burden with 45.3% spending up to BDT 999, but a large share 25.3% spend ≥ BDT 3,000) on health.

On the other hand, Footwear sector highlights moderate but significant expenses, with 42.9% spending BDT 200–500, 38.1% spending BDT 500–1,000, and 19% spending above BDT 1,000 per month.

Health-related expenses are most severe for leather workers, reflecting chronic exposure and weak social protection.

Access to Sick Leave

Formal access to sick leave exists for 85.7% of workers yet remains largely symbolic. Workers frequently avoid exercising this right due to fear of retaliation, wage loss, or dismissal, particularly during peak production.
As one RMG worker said: “If I go to the clinic, I lose my target. If I miss my target, I get fined.”

In the RMG sector, about 88.8% have access to sick leave-a positive sign, though often underused due to fear of job loss. While Leather sector shows that only 72.5% have access, and even fewer can afford to take it. On the other hand, Footwear sector highlights the highest availability with 90.5%.

Formal access does not guarantee actual use productivity pressures discourage workers from resting, even when ill. This highlights a critical gap between legal entitlements and actual practice, reflecting the intensifying pressure of climate-exacerbated production demands.

Table 9: Climate Change Impacts on Workers' Health

Dimension	RMG Sector	Leather Sector	Footwear Sector
Heat stress and fatigue	46.62% females affected by workplace heat; 73.3% felt unwell due to extreme heat; 54.3% dizziness/dehydration; 52.5% faced heat stress 4% heatstroke;	48.7% reported excessive heat stress/fatigue; 66.7% dehydration due to low water intake	60.7% heat-related fatigue; 23.3% dizziness; 16.7% dehydration
Physical health problems	54% headaches, 23% skin issues, 16% respiratory problems; 23.8% cold & fever	52% chronic headaches, 40% skin diseases, 31.3% respiratory problems, 30.7% eye irritation	30.7% headaches, 26.7% skin issues, 16% eye irritation, 9.3% respiratory problems;

Dimension	RMG Sector	Leather Sector	Footwear Sector
Mental health impacts	54.50% impacted by mental health; 21.3% stress/anxiety; 28.7% trouble sleeping	53.3% reported mental health impacts (stress, illness pressure, heat stress)	58.7% mental health impacts; 86.8% anxiety/stress; 49.5% low morale
Reproductive health	26.4% menstrual irregularities, 16.7% miscarriages, 9.6% pregnancy complications	4.08% 26.4% menstrual irregularities, 19% risk of miscarriage, 14.3% infertility, 9.5% pregnancy	24.2% menstrual irregularities, 13.6% pregnancy complications, 10.6% miscarriage risk
Access to Health Services	88.5% with health facilities at workplaces; 6.8% with <1 km distance; 3.3% with 1-3 km distance; 1.5% with 3-6 km distance	23% with health facilities at workplaces; 4.4% with <1 km distance; 57% with 1-3 km distance; 15.4% with 3-6 km distance	76% with health facilities at workplaces; 64.7% with <1 km distance; 23.3% with 1-3 km distance; 12% with 3-6 km distance
Avoid drinking water	23.8% to avoid using toilets;	40% to avoid using toilets;	21.3% to avoid using toilets;
Monthly expenditure due to illness	22.3% with BDT 200-500; 21.5% with BDT 500-1000; 26.3% with BDT >1000	45.3% with BDT 0-999; 29.3% with BDT 1,000-2,999; 25.3% with BDT ≥ 3,000	42.9% with BDT 200-500 38.1% with BDT 500-1000 19% with BDT >1000
Scope for sick leave	88.8% have access to sick leave	72.5% have access to sick leave	90.5% have access to sick leave

4.6.1 Insights from RMG Sector

The study highlights significant health concerns in the RMG sector related to extreme heat and adverse workplace conditions. A large majority of workers reported negative impacts on their health, with 77.3% indicating that their work environment affects their overall health, and 73.3% feeling unwell specifically due to extreme heat. Heat stress, dehydration, dizziness, and related illnesses were common, with 54.3% experiencing dizziness or dehydration daily or weekly. Qualitative findings reinforced these results, with a mid-level manager noting, *"Every day, one or two people face such problems (heat stroke, sickness, dehydration or fainting). It's mostly due to the heat-there are no such issues during winter."*

During the summer, it can be hard to stay hydrated, Nadia says. *"I always carry my water. If I feel thirsty, I get up, drink, and get back to work. However, there is pressure to meet daily production targets impacts her health. "We work 12 hours a day, with only one hour for lunch. If you're too tired or unwell, there's no time to rest," she explains. "If I feel too bad, I go to the medical room downstairs or take leave if needed. But there's always the pressure to meet targets."* – (Nadia, RMG, Case Story)

The study also revealed a gendered dimension, with female workers disproportionately affected. Approximately 46.62% of women reported heat-related health impacts compared to 30.58% of men, highlighting the need for gender-sensitive occupational health policies. Workers experienced a range of physical and mental health issues, including heat stress 52.5%, headaches 54%, sleep disturbances 28.7%, cold or fever 23.8%, skin problems 23%, musculoskeletal pain 19%, and stress or anxiety 21.3%.

One expert commented, *"One major health issue is heat-stress, which is quite serious… during the summer, there's*

higher tendency for skin diseases," while a female worker shared, "The long hours of standing without breaks during extreme heat days led to back pain, *swollen legs, and muscle aches."* Other informants highlighted dehydration, asthma, excessive sweating, sunburns, and rashes as prevalent health problems, with one manager stating, *"Because of an adverse weather event, workers frequently get skin and respiratory issues."*

Trade union representatives emphasized headaches and urinary tract infections caused by prolonged heat exposure and poor workplace conditions. A female worker also recounted, *"Due to the heat just the day before yesterday, three people fell unconscious from heat exhaustion… But they had to return to work the next day without even recovering from illness."*

"*We don't get time to drink water or use the washroom. We have to finish our tasks first, and only then, if there's time, we can go to the washroom. During the hot season, it's hard to work for 10 hours straight. There's no electricity at home, no water, and no proper food. It's exhausting, and the work pressure is high."* – Rina, RMG, Case Story

"*During the summer, it can be hard to stay hydrated. I always carry my water. If I feel thirsty, I get up, drink, and get back to work. However, there is pressure to meet daily production targets…. We work 12 hours a day, with only one hour for lunch. If you're too tired or unwell, there's no time to rest. If I feel too bad, I go to the medical room downstairs or take leave if needed. But there's always the pressure to meet targets."*– Nadia, RMG, Case Story

Mental and occupational pressures further compounded health risks. A male worker noted, "I work under constant stress for being present on time, completing tasks on time," while a mid-level manager added, *"We must make the workers do extra work; they experience more fatigue and mental pressure."* Despite 93.5% of workers having access to emergency health services and 88.5% to on-site health facilities, qualitative insights suggested that medical care was often inadequate, with one expert stating, *"Even though doctors are available, their treatment is fundamental."* Preventive care was limited, as 58.3% had never received employer-provided health checkups, and significant gaps existed in protective equipment availability (only 45.5% consistently had access). Sick leave access was uneven, with 11.3% unable to take leave, often due to financial constraints or job insecurity.

Reproductive health emerged as a critical area of concern, particularly for women. About 18.3% reported that climate-induced stress affected reproductive health, with menstrual irregularities (26.4%) and miscarriage (16.7%) being the most reported issues, followed by pregnancy complications (9.6%) and infertility (5.9%). Qualitative data highlighted alarming incidents, such as one female worker recounting, "*Just yesterday, there was an incident of miscarriage in the factory… Then two of us took her to the clinic. Things like this happen, sometimes inside the factory."* Another worker explained management's lack of support during emergencies: *"Whether a worker lives or dies is not their (management's) concern. We (workers) feel sick but have to keep working."* Access to reproductive health services was limited, with only 48.6% reporting workplace access, leaving a significant proportion without support. One worker described the disregard for health during emergencies: *"I had a miscarriage with heavy bleeding while working. The doctor told me to take rest, but the management told me to return to work since no leave was granted for me."*

Overall, the findings illustrate that extreme heat and poor working conditions in the RMG sector result in severe physical, mental, and reproductive health issues, disproportionately affecting female workers. While some emergency health and on-site services exist, they are often inadequate, highlighting an urgent need for improved workplace policies, gender-sensitive interventions, preventive care, and enhanced occupational health and safety measures to protect worker well-being and productivity in the face of climate-induced stressors.

4.6.2 Insights from Leather Sector

The study highlights significant health risks among leather workers, revealing pronounced gender disparities and links to climate-related stressors. Male workers were disproportionately affected by weather-related health problems, with 63.33% reporting impacts compared to only 10.67% of female workers, reflecting both higher exposure to physically demanding and high-risk tasks and potential underreporting among women. This pattern underscores the need for gender-sensitive occupational health measures that account for differences in exposure, job roles, and reporting barriers. Mental health impacts were also unevenly distributed across income groups, with middle-income workers most affected 24.67%, followed by higher- and lower-income groups, suggesting that climate-induced disruptions: such as extreme heat, waterlogging,

and absenteeism-strain those balancing production pressures and financial responsibilities. The findings emphasize that climate-related stressors are both physical and psychosocial, necessitating climate-resilient worker protections that address vulnerabilities across income levels.

Regarding health problems over the past six months, the most frequently reported issues were chronic headaches or dizziness 52% and heat stress or fatigue 48.7%, followed by skin diseases 40%, respiratory problems 31.3%, and eye irritation or vision issues 30.7%. Qualitative findings reinforced these results, with informants noting fever, dehydration, skin disorders, colds, gastric issues, and abnormal blood pressure. A compliance officer observed, *"In terms of climate change, what I've noticed among tannery workers suffering from health issues like colds and some respiratory problems. Also, general illnesses like headaches and fever are the main health issues they face."*

Dehydration emerged as a critical concern, with 66.7% of respondents affected, as one CSO representative noted, *"Even if temporary, it can have long-term effects. Skin-related diseases also appear… There might also be eye-related issues due to excessive dust."* Occupational hazards were exacerbated by chemical exposure, with risks of skin and lung diseases highlighted by trade union representatives.

Mental health was also impacted, with 53.3% reporting negative effects, often linked to heat-related stress, illness, and unsafe working conditions. One informant remarked, *"Mental health problems are there… Heat is leading to mental stress."*

Access to healthcare was inconsistent. Only 54% reported emergency medical care at the workplace, and qualitative findings emphasized severe gaps, with workers often traveling hours to Dhaka for treatment. One worker shared, *"No emergency medical treatment is available here… One man fainted from the heat while working and died before reaching the hospital."* First aid and part-time medical visits were insufficient given the sector's size and risks. Safety committees were largely inactive in addressing climate-induced illnesses, with only 46.8% taking action.

Reproductive health concerns were also significant, though largely underreported or unrecognized. Only 18% of workers believed climate-induced stress significantly affected reproductive health, and 50.7% were unsure, indicating knowledge gaps. Some informants noted indirect impacts of climate and environmental conditions, while chemical exposure was also cited as a key risk factor. Among women, 19% reported increased miscarriage risk, 14.3% faced infertility or conception difficulties, and 9.5% experienced pregnancy complications, though 90.5% reported no issues, likely reflecting underreporting or limited awareness. Access to reproductive health services was extremely limited (7.3%), and maternity leave provisions were inadequate, with only 33.3% of workers reporting access despite legal entitlements under the Bangladesh Labour Act, 2006. One informant shared, *"From what I've learned in training, if workers who handle chemicals don't use PPE properly, day by day, their reproductive ability can be affected."* Another described workplace neglect during emergencies: *"Just yesterday, there was an incident of miscarriage in the factory… the management told me to return to work since there was no leave granted for me."*

Overall, the findings indicate that leather workers face a complex interplay of climate-induced health risks, occupational hazards, insufficient medical support, and gendered vulnerabilities. Extreme heat, dehydration, chemical exposure, and unsafe working conditions contribute to physical, mental, and reproductive health challenges. Limited access to emergency care, reproductive health services, and maternity leave further exacerbates these risks, highlighting an urgent need for comprehensive, gender-sensitive, and climate-resilient occupational health and safety measures in the leather sector.

4.6.3 Insights from Leathergoods & Footwear

The study highlights the significant health impacts of climate stress on footwear industry workers, particularly from extreme heat and poor air quality. A majority of workers (60.7%) reported heat-related fatigue, while 30.7% experienced headaches, 26.7% suffered skin rashes or burns, 23.3% reported dizziness, and 16.7% experienced dehydration and eye irritation. Less common issues included breathing difficulties (9.3%) and isolated

cases of cough, fever, back pain, urinary tract infections, and allergies, while 25.4% reported no health problems. These findings indicate that suboptimal working conditions, particularly high temperatures, compromise both physical health and workplace well-being.

Climate-induced health challenges also affected attendance, with 55.3% of workers not missing any workdays, while 27.3% missed 1–3 days, 14% missed 4–7 days, and 3.3% missed more than 8 days, averaging 2.52 days lost. This demonstrates the impact of environmental stressors on productivity, income, and workforce availability.

Access to healthcare was generally adequate but uneven: 76% of workers had on-site health or first aid services, 10.7% sought external care, and 12.7% lacked access entirely. Among those seeking care outside the factory, 36% faced longer travel distances, posing challenges during emergencies and highlighting vulnerabilities among specific groups, particularly women.

Mental health impacts were also prevalent, with 58.7% reporting stress, anxiety, or job-related mental strain due to heat, illness, and job insecurity, while 34% disagreed and 7.3% were unsure. Among affected workers, 86.8% reported anxiety or stress, 49.5% noted low morale, and 38.5% experienced increased workplace conflict. Male workers were more likely to report stress, reflecting societal expectations and limited outlets for emotional expression. Stress was also geographically concentrated in high-density industrial areas such as Ashulia and Savar, emphasizing the compounded pressures in large factory zones.

Reproductive health concerns were notable, with 48.7% of workers indicating an impact on their reproductive health due to climate-induced stress, while 47.3% reported no effect. Key issues included menstrual irregularities 24.2%, pregnancy complications 13.6%, and miscarriage risk 10.6%, though 66.7% reported no problems. Access to reproductive health services was split almost evenly, with 52.2% having some access at work, while 47.8% did not. Among symptomatic workers, 32.4% reported vaginal irritation or menstrual irregularities, 29.7% experienced urinary tract infections, 10.8% reported headaches and dehydration, and 2.7% had kidney issues. These findings highlight the critical need for improved workplace sanitation, gender-sensitive health services, and reproductive health support to mitigate climate-induced health risks and enhance worker well-being.

4.7 Perspectives on Climate Change and Just Transition

Across the RMG, Leather, Leathergoods and Footwear sectors, climate change is increasingly affecting workers' wellbeing and workplace conditions. In the RMG sector, most workers are largely unaware of climate change, yet 78% report daily hardships such as job insecurity, heat stress, and health impacts, which reflect its indirect effects. Similarly, in the Leather sector, 65% of workers recognize unsafe conditions linked to climate disruptions, while in Footwear, 70% experience productivity losses and job risks related to extreme weather. Awareness of just transition is low across all sectors, with fewer than 20% of workers understanding the concept initially, but once explained, 82% see it as a pathway to safer jobs, fair wages, and skill development opportunities.

Trade unions demonstrate moderate awareness, with 60% recognizing climate change as a driver of weakened labour rights and unsafe workplaces, while 68% view just transition as a mechanism to strengthen worker protections and bargaining power. Employers and business associations perceive climate change mainly through productivity loss and rising operational costs, with 57% recognizing climate risks but only 40% acknowledging the potential benefits of greener practices. Government actors show higher policy-level awareness (over 70% link climate actions to SDGs), but only 35% report strong enforcement of adaptation measures; they see just transition as both a challenge and an opportunity to modernize industries. Civil society organizations are most aware, with 85% framing climate change as a justice issue, and 78% promoting just transition as a rights-based approach to inclusion and equity.

Overall, climate change and just transition are interlinked. Climate-related vulnerabilities create economic, health, and job risks, while just transition offers structured pathways to mitigate these impacts through skill development, worker participation, social protection, and green innovation. Examples such as solar energy adoption, individual Effluent Treatment Plants, eco-friendly vegetable tanning, and LWG certification illustrate how targeted interventions can translate climate awareness into actionable, sustainable practices across the RMG, Leather, Leathergoods and Footwear sectors.

The study confirms that climate change is intensifying vulnerabilities for workers in Bangladesh's RMG, Leather, Leathergoods and Footwear sectors, while adaptation and just transition measures remain fragmented and uneven.

Evidence suggests that workers are not passive victims but active stakeholders, willing to engage in skill development and sustainable practices if institutional support exists. Therefore, policy interventions must prioritize:

- Expanding skill development and reskilling programs for green jobs.
- Strengthening labour rights, unionization, and worker participation in environmental decision-making.
- Integrating workplace adaptation with broader community-level resilience programs.
- Enhancing social protection coverage to buffer climate and economic shocks.
- Scaling green financing to enable both large and small factories to transition sustainably.

By centering workers in the design of climate policies, Bangladesh can build a just transition framework that is socially inclusive, economically viable, and environmentally sustainable. In the leather industry, solar power integration and individual Effluent Treatment Plants (ETPs) are helping reduce reliance on fossil fuels and improve waste management. Eco-friendly vegetable tanning, an alternative to harmful chrome tanning, is gaining traction, and many tanneries are pursuing environmental certifications like the Leather Working Group (LWG) certification.

Table 10: Perspectives on Climate Change and Just Transition in RMG, Leather, Leathergoods and Footwear sectors

Stakeholders	Climate Change	Way to Just Transition
Workers	Most workers are unaware but they feel it through daily hardships, though they lack deeper knowledge of its causes. Their outlook is shaped by its impact, which poses job security and displacement, yet they see some adaptation measures as small signs of hope.	Awareness of just transition is very low, but workers see it as a hopeful pathway once explained. They fear job loss and insecurity, yet imagine opportunities for fair wages, safer jobs, and new skills if properly supported.
Trade Unions	Trade unions recognize climate change as a driver of unsafe conditions and weakened labour rights. Awareness is moderate; they see that most workers remain uninformed. While critical of poor enforcement, they also view climate change as a chance to strengthen protections and amplify worker voices.	Unions are moderately aware and see a just transition as a tool for stronger labour rights. They worry about weak worker participation but also view it as a chance to secure protection, bargaining power, and fairer conditions in industry.
Employers/ /Business associations	Employers perceive climate change as a disruption to productivity and competitiveness. Their awareness varies: business associations understand sustainability standards, while many managers focus only on immediate disruptions. They see rising costs negatively, but also recognize opportunities to innovate and access global markets through greener practices.	Employers are aware mainly due to buyer pressure. They often see just transition as a costly burden, but also recognize its potential to improve competitiveness, reputation, and compliance.
Government/Government organization	Government actors are relatively aware of climate change at the policy level, linking it to SDGs and global commitments. Yet enforcement gaps remain a major weakness. Despite this, the government perceives climate change as a chance to modernize industries, expand green financing, and enhance national competitiveness.	Government awareness is fairly high in policy terms, but weaker in practice. They perceive just transition as both a challenge, given limited resources, and an opportunity to align industries with sustainable development and global standards.

Stakeholders	Climate Change	Way to Just Transition
Civil society organization (CSOs)	CSOs are highly aware and view climate change as a justice issue affecting vulnerable workers. They are critical of weak accountability but highlight positive examples of adaptation and innovation. Their perception balances urgency with optimism, emphasizing inclusion and fairness in climate responses.	CSOs have the strongest awareness, framing just transition as both a rights-based demand and a path to social justice. They criticize low worker awareness and weak commitment from brands, yet promote it positively as a chance for equity and inclusion.

4.7.1 Insights from RMG Sector

Across the RMG sector, Just Transition remains a little-known concept, particularly among workers and mid-level management. Awareness is higher among business associations and trade unions, but it is often limited to forums and leadership circles, with minimal penetration at the factory floor level. Workers strongly associate the issue with automation and job loss, expressing both fear and willingness to retrain if provided with adequate support. Employers sometimes reassign workers informally instead of dismissing them, reflecting an embryonic form of Just Transition practice, but without a structured or policy-aligned framework. Civil society and unions acknowledge the urgency but admit that planning remains fragmented and reactive. The findings suggest that for the RMG sector, building awareness, policy clarity, and coordinated training programs are critical first steps to ensure workers are not left behind in the twin transitions of automation and climate adaptation.

At Workers Level: Among RMG workers, the concept of Just Transition is virtually unknown. Focus group participants openly admitted, *"We don't know what that is or what it's about"* (Worker FGD). Some had only vaguely heard the term but lacked clarity: *"I've vaguely heard something like that before. But workers don't really know much about it"* (Worker FGD). Instead, their concerns were grounded in the realities of automation and job security. Workers feared being replaced by machines yet showed readiness to adapt if proper support was given: *"When the new machines come, we will have no jobs. But we're willing to learn. The brand does not provide any facilities"* (Worker FGD). This highlights that while technical knowledge of the concept is lacking, workers implicitly connect Just Transition to retraining, reskilling, and employment security during technological change.

At Trade Unions Level: Trade unions are beginning to articulate the relevance of Just Transition, even if the term itself is not widely used. One union leader explained, "We are trying to give importance to workers' voices" (Trade Union KII). Although unions admit they have not formally begun working on the issue, they recognize its emerging significance: *"Actually, we haven't started working on it in that way yet, so we haven't had discussions about it. But we've started in some areas"* (Trade Union KII). This points to an opportunity to build capacity within unions so they can advocate for climate-and automation-responsive labour protections in the future.

At Mid-Level Management and Employers' Level: Mid-level management demonstrated slightly more awareness but often equated Just Transition solely with automation and worker reassignment. For example, one manager stated, *"With automation on the rise, the factory doesn't dismiss workers but reassigns them to other roles, showing an awareness of fair transition practices"* (RMG Manager KII). Another noted, *"Automation is being introduced, but instead of firing workers, they are placed in new sections or factories where possible"* (RMG Manager KII). While this indicates a basic awareness of worker protection, most admitted limited knowledge: *"This term (Just Transition) is new to me. What you mentioned earlier about jobs—that is something everyone is familiar with" (*RMG Manager KII). The overall picture suggests informal practices exist to reduce displacement, but without structured planning or a comprehensive understanding of Just Transition principles.

At Business Associations Level: Business association representatives highlighted that the idea of Just Transition has entered policy and donor-driven discussions, particularly through initiatives like the Employment and Trade Impact Framework (ETIF). One representative explained, *"We've been part of some forums and ETIF discussions where Just Transition came up. But it's still a*

new idea for many factory owners. There's a gap in clarity, both from buyers and the government" (Business Association KII). Another stressed the urgency of moving from talk to action: "We've been talking about this in seminars, but it's time to act now. If we delay, we'll fall far behind" (Business Association KII). Despite this, awareness has not filtered down to most factories or workers, leaving a gap between high-level discourse and practical implementation.

At Civil Society Level: Civil society organizations (CSOs) acknowledge the importance of Just Transition but admit that structured planning is missing.

A BRAC respondent noted, "To be honest, we (CSO) haven't planned for it properly. We know displacement is happening, we're offering basic services, but a structured Just Transition framework is not in place yet" (CSO KII). Another expressed frustration at the lack of concrete support for displaced workers: *"Just Transition sounds good at workshops, but when 1,800 workers lose jobs while there's no real plan for them" (CSO KII). A respondent from the RSC similarly observed, "Just Transition is not on anyone's radar, not owners, not most CSOs. We're still at level one" (CSO KII). T*his underscores the gap between conceptual recognition and operational readiness.

Table 11: Perspectives on Climate Change and Just Transition in RMG Sector

Stakeholder Group	Awareness Level	Key Perceptions / Concerns	Needs & Gaps
Workers	Very low – most have never heard the term "Just Transition."	Fear of job losses due to automation; willingness to learn new skills; feel unsupported by brands and management. "When the new machines come, we will have no jobs. But we're willing to learn"	Awareness-raising on Just Transition; structured retraining programs; job security mechanisms; better brand/employer support.
Trade Unions	Emerging – starting to emphasize worker voices but lacks a deep understanding.	Acknowledge importance of safeguarding workers but no systematic action yet. "We are trying to give importance to workers' voices"	Capacity building on Just Transition; advocacy tools; involvement in policy and training design; outreach to workers at the grassroots level.
Mid-level Management	Low – limited, mostly linked to automation; some informal practices exist.	Associate Just Transition with shifting workers to other roles instead of firing; see it as a practical response to automation but lack a holistic understanding. "With automation… the factory doesn't dismiss workers but reassigns them"	Clearer guidance on Just Transition frameworks; training for managers on planning transitions; integration of climate and labour dimensions.
Business Associations	Medium – exposed through forums (e.g., ETIF), but not widespread in factories.	Recognize urgency but note lack of clarity from buyers and government. "We've been talking about this in seminars, but it's time to act now"	Policy clarity; alignment between buyers, government, and industry; stronger dissemination of knowledge to members and the factory level.
Civil Society (CSOs/NGOs)	Low to medium – concept recognized but poorly planned for.	Reactive responses to displacement; no structured framework. "Just Transition sounds good at workshops, but when 1,800 workers lose jobs—there's no real plan."	Development of structured frameworks; integration into labour rights and climate programs; better collaboration with unions and government.

4.7.2 Insights from Leather Sector

The concept of Just Transition remains largely unfamiliar to leather workers, with most respondents admitting they had never heard the term. However, despite this lack of formal awareness, workers demonstrated a strong understanding of the underlying imbalance between owners and workers. They repeatedly emphasized that development benefits disproportionately favour factory owners, while workers remain excluded. As one worker explained, *"We (workers) are not familiar with the term 'Just Transition.' But in reality, the owners move forward, and the workers fall behind. Owners get various incentives from the government, but the workers don't receive any benefits" (Worker FGD). Another echoed, "We don't know the term, but we know the truth—owners get incentives, workers get nothing. They move ahead; we stay behind"* (Worker FGD). This indicates that even without technical knowledge of the concept, workers recognize structural inequities that Just Transition aims to address.

At Workers Level: Although unfamiliar with the terminology, many workers expressed openness to environmentally friendly technologies if training and support were provided. One group stated, *"We would be interested (if new, environmentally friendly technologies are introduced in the tannery, and the government arranges training)"* (Worker FGD). Yet, frustrations persist regarding the lack of benefits reaching workers: *"They said if the owner eats, the worker eats. But after coming here, only the owners are eating well. We didn't get anything"* (Worker FGD). Furthermore, while automation and modernization are gradually entering the sector, workers expressed concern over job displacement. They emphasized the need for alternative employment opportunities and strategic planning: *"Although automation is being implemented gradually, worries about job losses are intensifying. Workers embrace new technologies, but they stress the necessity of alternate work opportunities and careful planning to prevent displacement" (Worker KII).*

At Trade Union Level: Trade union representatives acknowledged some progress but highlighted the limited scope of Just Transition awareness. One noted, *"Just Transition has been started for some time, but the people of our country do not know much. Some training programs are being conducted. We have to prepare for this. Workers have to fulfil those responsibilities at the workplace. I think the training is enough"* (TU Representative).

Another emphasized that awareness is mostly confined to leadership: *"Regarding Just Transition, nothing is fully done yet. Some things have been done at the leadership level… But at the general worker level, they are not yet aware of this"* (TU Representative). This demonstrates a disconnect between leadership-level discussions and workers' day-to-day realities.

Stakeholders widely agreed that trade unions and collective worker organizations must play a central role in bridging this awareness gap. One informant stressed, *"Their role (Trade Union) is very important because they are directly involved with the workers. Not just trade unions, but the owners and middle-level management should also stay involved… Providing regular awareness programs and training will make the transition more effective"* (Industry Stakeholder).

At Mid-Level-Management and Employer Level: The perspectives of mid-level management and employers in the leather sector reveal a very low level of awareness and conceptual clarity regarding Just Transition. Several managers openly admitted that they were hearing the term for the first time, reflecting a lack of exposure to the global discourse on sustainable labour and climate adaptation. As one respondent explained, "Oh, I'm actually just hearing it from you for the first time. I haven't heard of this before, so I don't have much knowledge on the subject" (Leather Mid-level Management, KII). Another manager attempted to interpret the concept in literal terms, asking, *"Just Transition! —does that mean just a change? A change, basically…?"* (Employer, KII). These statements illustrate not only the absence of technical knowledge but also the conceptual confusion that exists within the sector.

At the industry level, awareness is highly uneven and fragmented. While a small group of tanneries primarily larger or export-oriented ones—are beginning to recognize the importance of preparing for transition, the majority remain disengaged. As one respondent observed, *"There are 155 tanneries operating here, out of which 15 tanneries understand that we need to be at this level. While 140 tanneries don't care about these issues"* (Employer, KII). This indicates that only a limited subset of enterprises has started aligning with global sustainability demands, while the rest continue with business-as-usual practices.

Respondents also highlighted a vertical gap in awareness between leadership and workers. Even where senior officials demonstrate a limited familiarity with the concept, workers are almost entirely unaware. As one manager noted, *"In the current scenario, our senior officials are somewhat familiar with the concept of a just transition, but the workers are mostly unfamiliar. Some may say they've never heard of it before"* (Mid-level Management, KII). This lack of trickle-down knowledge underscores the absence of systematic communication or training mechanisms within the industry.

Finally, some managers emphasized the importance of collective involvement and awareness-building for effective transition. Trade unions, owners, and mid-level managers were all identified as key actors in supporting worker-level understanding and participation. As one respondent stressed, *"Their role (Trade union) is very important because they are directly involved with the workers. Not just trade unions, but the owners and middle-level management should also stay involved with the workers. Providing regular awareness programs and training will make the transition more effective"* (Employer, KII). This perspective suggests a recognition, albeit limited, that successful transition cannot be imposed top-down but requires collaborative engagement across stakeholders.

At Business Associations Level: Leather business associations demonstrate a limited and superficial awareness of the concept of Just Transition, while grassroots-level understanding among workers remains largely absent. As one association representative noted, *"The majority of workers are not aware of the Just Transition concept, even though tannery groups are somewhat aware of it."* This indicates a top-down gap in knowledge dissemination, where even at the organizational level, awareness does not translate into in-depth expertise or actionable strategies. The same source added, *"Even associations lack in-depth knowledge or application understanding,"* highlighting that recognition of the term does not equate to operational comprehension or policy integration.

While the concept is increasingly discussed in industry forums and awareness meetings, these engagements remain largely rhetorical.

As observed in interviews, *"Awareness meetings are being held on Just Transition. Discussions are being held in various forums,"* yet such dialogues have not led to tangible outcomes.

A critical barrier identified is the economic hesitation of business owners to invest in long-term sustainability measures. One official explained, *"Businessmen think about the investment they will make and try to get quick returns from it. These are just a matter of time; they are not interested in investing in these things."* This profit-drivenmindset, prioritizing short-term gains over environmental and social sustainability, severely limits the advancement of Just Transition principles.

Crucially, there have been no formal training or capacity-building initiatives related to Just Transition within the sector. As confirmed by multiple stakeholders, *"So far, no training has been done,"* and "There isn't any real implementation or training, despite the fact that the idea of Just Transition is being addressed in forums and gatherings." This disconnects between discourse and action reveals a performative engagement with sustainability concepts—where participation in discussions serves as symbolic compliance, rather than a foundation for transformation. The reluctance to adopt long-term solutions like solar energy, due to perceived delayed returns, further underscores the need for policy incentives, financial support, and structured guidance to move from awareness to implementation. Without these, Just Transition remains an abstract idea, not a lived reality in the leather industry.

At Civil Society Level: Civil society actors provided a critical perspective, noting that the leather sector lags significantly behind other industries in readiness for Just Transition. One CSO representative stated, *"The leather industry in Bangladesh is still lagging behind- If we talk about green transformation-managing effluents, internal environmental conditions, chemical handling, and storage-the sector is quite far behind. First and foremost, they need to address the basics"* (CSO Representative). Compared to the RMG sector, which has made strides in compliance and digital adaptation, the leather industry has yet to internalize fundamental principles of environmental sustainability, decent labour, and digital transformation.

Table 12: Perspectives on Climate Change and Just Transition in Leather Sector

Stakeholder Group	Awareness Level	Key Perceptions / Concerns	Needs & Gaps
Workers	Very low – most have never heard the term	Owners benefit from incentives while workers are left behind; willing to learn green technologies if training provided	Awareness programs in simple language; skills training for green jobs; inclusion in transition planning
Trade Unions	Partial – leadership aware, general workers not	Some training exists, but limited to leadership; workers excluded; automation raises fears of job loss	Broader outreach to members; integration of Just Transition in bargaining; resources to support awareness
Mid-level Management	Almost none	Many hearing the term for the first time; see it as "just change" without context. They mainly focused on profit and export compliance and weak prioritization of worker inclusion	Training on concept, policy, and practical steps; link Just Transition with compliance and productivity; buyer pressure, and accountability
Business Associations	Moderate but shallow	Aware at the discussion level; hesitant to invest due to delayed returns; lack of practical implementation	Deeper technical understanding; incentive schemes to reduce cost–benefit hesitancy; sector-wide roadmaps
Civil Society (CSOs)	High	Critical of slow readiness; highlight lack of compliance basics (waste, effluents, chemicals) and lag vs. RMG	Advocacy for stronger enforcement; capacity-building for factories; push for inclusive, worker-centered transition

4.7.3 Insights from the Leathergoods and Footwear Sector

In the Leathergoods and Footwear sector, awareness of Just Transition is similarly underdeveloped, though some early signs of recognition are visible due to global buyer demands for compliance and sustainability. Workers, trade unions, and management alike demonstrate low familiarity with the formal concept, yet they indirectly understand its implications through daily struggles with precarious work, low wages, and climate-induced risks. Unlike the Leather sector, where a single migration origin (Noakhali) dominates, the Leathergoods and Footwear workforce reflects a more geographically diverse migration base, with workers from Bogura, Sirajganj, Rangpur, and Mymensingh. This diversity shapes a workforce that is more mobile but also more fragmented in organization and bargaining power.

At Workers Level: Most footwear workers have never heard the term *"Just Transition."* However, they relate strongly to their underlying principles when explained. Workers identified unsafe workplaces and job risks linked to heat stress, machine breakdowns, and poor ventilation as climate-related challenges. At the same time, they expressed willingness to adopt safer and greener practices if they were given training and fair wages. The data also shows that 40% of footwear workers lack any social protection, while only 6.7% reported health insurance coverage conditions that make them highly vulnerable to both economic and climate shocks. This absence of a safety net means that a sudden heatwave or an economic shock could completely upend their lives. Their willingness to adapt offers a path forward, but it's clear that this transition must be built on a foundation of dignity and security.

At Trade Union Level: Trade union engagement is minimal and fragmented. Union leaders admitted that the issue of Just Transition has not yet entered the agenda in the footwear sector, even though climate-related challenges such as rising indoor heat and supply chain disruptions are widely felt. This signals a missed opportunity to connect worker struggles over health, productivity, and social protection with the broader transition discourse. Without capacity-building and organizational support, unions remain reactive rather than proactive.

At Mid-Level Management and Employer Level: Employers and mid-level managers in the footwear and mid-level managers in the footwear sector are only beginning to engage with sustainability. Several admitted limited awareness of Just Transition, often equating it with compliance-driven standards imposed by international buyers. Priorities remain cost minimization and timely delivery, leading to little investment in worker well-being or long-term resilience. Although some firms recognize that compliance with international standards could open export opportunities, the translation into worker-centered transition strategies remains absent.

At Business Associations Level: Industry associations in the footwear sector demonstrate a slightly higher awareness compared to leather, as they regularly interact with global buyers and certification processes. However, the understanding is still largely surface-level and compliance-oriented, rather than transformative. The dominance of a market-driven perspective, with limited integration of labour rights or social protection concerns.

At Civil Society Level: CSOs working in the footwear sector pointed out that despite relatively better international attention to sustainability in footwear supply chains, workers remain excluded from transition planning. A CSO respondent explained, *"Climate impacts are real heat, illness, and wage loss but social protection is almost absent. Without stronger frameworks, footwear workers will remain on the margins of green transformation."* Civil society actors emphasized the need to integrate footwear workers into broader Just Transition agendas, warning that otherwise they risk being overlooked in both national and global policy dialogues.

The Leathergoods and Footwear sectors illustrate both vulnerability and opportunity. Workers face high exposure to climate risks heat stress, productivity decline, and unsafe workplaces while lacking adequate social protection. At the same time, the sector's dependence on global markets creates potential leverage points for embedding Just Transition principles through buyer pressure, certification schemes, and compliance-driven reforms. Yet without deliberate worker-centered planning, the transition risks reinforcing inequality, where compliance benefits owners and exporters while leaving workers excluded. Closing this gap requires targeted awareness-building on at the factory floor, stronger trade union engagement, and alignment between global buyer requirements and local worker protections.

Table 13: Stakeholder Perspectives on Just Transition in the Leathergoods and Footwear Sector

Stakeholder Group	Awareness Level	Key Perceptions / Concerns	Needs & Gaps
Workers	Very low – most have never heard the term	Struggle with low wages, unsafe workplaces, heat stress, and lack of social protection (40% with none, only 6.7% with health insurance). Express willingness to adopt greener practices if training and fair wages are ensured.	Awareness in simple language; skills training for green and safe practices; inclusion in transition planning; stronger social protection mechanisms.
Trade Unions	Very limited – leaders somewhat aware, workers largely not	Climate-related struggles are recognized but not integrated into union agendas. Focus remains on wages and rights; climate and transition issues seen as secondary.	Capacity-building to connect labour struggles with climate issues; integration of Just Transition in bargaining; resources to support wider member awareness.
Mid-Level Management / Employers	Almost none	Understand Just Transition only through buyer compliance requirements; see it as a cost burden. Worker well-being and social protection are not prioritized.	Training on Just Transition concepts and policy links; connecting green transition with productivity; buyer pressure and accountability for fair worker inclusion.
Business Associations	Moderate but surface-level	Familiar through buyer interactions and certification, but focus only on export compliance. Worker rights/social protection remain excluded.	Technical guidance on worker-inclusive transition; incentive schemes for members; sector-wide green transition roadmaps aligning with buyer demands.
Civil Society (CSOs)	Relatively high	Critical of the absence of worker-centered planning; highlight vulnerabilities like heat stress, wage loss, and lack of benefits. Warn that workers risk exclusion if reforms stay compliant-only.	Advocacy for inclusive Just Transition; stronger enforcement of standards; worker-focused social protection and capacity-building programs.

4.8 Industry Readiness against Climate Change

The readiness of Bangladesh's RMG, leather, and footwear sectors to address climate change varies significantly across dimensions such as environmental practices, workplace heat stress mitigation, worker training, and institutional support. While all three sectors show signs of progress, substantial gaps remain in adaptation, compliance, and policy enforcement.

Sustainable and Environmental Practices

The RMG, Leather, Leathergoods and Footwear sectors exhibit significant weaknesses in environmental sustainability, with evidence of widespread gaps in compliance and systemic preparedness. Nationally, only one-third of factories maintain effective waste treatment systems, and fewer than 24% comply with international sustainability standards raising concerns of superficial compliance or *"greenwashing."* Material reuse remains limited at 16.9%, reflecting a persistent reliance on linear production models, while the reduction of highly toxic chemicals in leather production is minimal 3.3%.

Sectoral variations are stark: the RMG sector demonstrates relative progress, with 47.3% of respondents reporting the presence of waste management systems, 34.3% acknowledging compliance with international standards and reuse of materials 24.5%. The leather sector, however, remains the most environmentally vulnerable, with 44.7% of factories reporting no pollution-reduction efforts and only 34% equipped with waste management systems. Despite some advanced practices among larger tanneries such as chromium-free tanning, rooftop solar, and effluent treatment plants these remain exceptions rather than norms. The footwear sector performs better in pollution reduction 44% and adoption of solar and eco-machinery, but lacks robust water management measures, revealing fragmented rather than structural shifts toward sustainability.

RMG and Footwear industries show stronger engagement with sustainability practices, while the Leather sector is lagging significantly, especially in chemical management, waste management and water treatment systems.

Climate-resilient Measures at Factory Level

Adaptation efforts are disproportionately focused on immediate threats, with 77.7% of factories adopting heat-stress mitigation measures, typically limited to low-cost solutions such as fans and shaded areas.

Structural resilience is mixed: while 56.2% report some form of flood protection, only 20% have adequate water management systems an alarming gap given Bangladesh's recurrent monsoon flooding and supply chain vulnerabilities. Renewable energy adoption remains critically low 13.3% despite the country's vast solar potential.

Sector-level differences are notable: RMG factories shows stronger preparedness with 69.5% heat-stress initiatives, 77% reinforced buildings, 76% flood barriers, 70.8% ventilation systems. However, energy-efficient equipment 15.8% and renewables 20.5% remain low. While Leather factories show the higher on building reinforcement 85.3% and heat-stress measures 85.3%, but weaker on flood protection 59.7% and ventilation 50.7% but renewable energy is minimal 7.3%. On the other hand, Footwear factories cited most advanced in heat mitigation 92% and ventilation 92%, but limited uptake of rainwater harvesting 1.3%, waste recycling 14.7%, and eco-machinery 36%. Solar adoption is moderate 37.3%.While all three sectors invest in heat-stress mitigation, RMG leads in flood resilience, Leather in structural reinforcement, and Footwear in ventilation and solar energy. Renewable energy adoption is generally very weak.

Worker Safety and Governance Structures

Institutional readiness, measured through the existence of safety committees, reveals uneven progress. In the RMG sector, 89.5% of factories report having safety committees, with just over half 53.4% incorporating climate awareness into committee activities. In the footwear sector, 85% of factories maintain safety committees, though only 47.3% actively address climate-related risks, often with limited training. The leather sector is the most vulnerable, with just 30.15% of factories establishing committees and minimal climate-focused engagement. This governance gap weakens both worker participation and institutional capacity to address the escalating risks of climate change.

Social Protection and Worker Resilience

The study reveals a profound deficit in social protection across RMG, Leather, Leathergoods and Footwear sectors exposing workers to heightened climate vulnerability. Across the RMG, Leather, and Footwear sectors, about 39.7% reported having no social protection benefits at all. Only 10.5% of workers have health insurance, 9.4% have access to pension schemes, and 8.2% benefit from disability allowances.

On the other hand, maternity protection reaches just 27.3% of women, and a mere 2.5% of workers are entitled to injury compensation, despite widespread exposure to hazardous occupational and climatic conditions.

This systemic exclusion from social safety nets compounds the risks of climate-induced illness and injury. For instance, without health insurance, workers bear the full financial burden of treatment for heatstroke, respiratory illness, or chemical-related injuries. The absence of maternity benefits for the majority of women forces them to return to unsafe workplaces shortly after childbirth, undermining both maternal and child health. Similarly, the near absence of injury compensation denies justice to workers suffering long-term disability from unsafe and climate-exposed working environments.

Sectoral disparities highlight different layers of vulnerability. In the RMG sector, 31% of workers reported access to some form of social protection the highest among the three industries. Notably, maternity benefits 47.8% are comparatively more common, but access to health insurance 13.4%, pensions 13.8%, and disability coverage 10.7% remains low. The leather sector demonstrates the sharpest vulnerabilities, with 76.5% of workers reporting no benefits. Only a marginal share has health insurance 6.5%, pensions 3.3%, disability allowances 7.3%, or injury compensation 6.4%, despite the sector's intense chemical exposure and high occupational risks. The footwear sector is equally deprived, with 84.2% of workers excluded from benefits altogether. Social protection coverage here is negligible: health insurance 6.7%, pensions 3.8%, and injury compensation 5.3% remain almost absent.

The findings demonstrate how weak or absent social safety nets intersect with climate-related occupational hazards to amplify precarity. Workers are forced into out-of-pocket spending for illness, which often consumes 30–50% of monthly wages, pushing families into debt, food insecurity, and intergenerational poverty. For women, inadequate maternity and reproductive health protection represents a form of climate-enabled structural violence, as high-heat and chemical exposure compound reproductive risks in the absence of institutional safeguards.

The lack of social protection in Bangladesh's industrial sectors not only undermines the health and dignity of workers but also erodes industry readiness for a just transition. Without robust social insurance, pension systems, and occupational injury compensation, climate resilience remains unattainable both at the factory level and for the national labour force.

Management Perceptions and Climate Readiness

Management attitudes represent a critical barrier to sector-wide adaptation. Nationally, only 36.5% of factory management demonstrate a positive orientation toward climate resilience, with the majority remaining indifferent, skeptical, or resistant. Sectoral differences are again significant: footwear management shows relatively higher readiness at 52.7%, likely to reflect direct exposure to buyer-driven sustainability pressures. By contrast, the leather sector exhibits entrenched resistance, with only 24.7% acknowledging climate action and nearly one-third reporting no efforts at all. The RMG sector falls in the middle, with 34.8% recognizing consistent environmental action, though many highlight LEED-certified factories as symbolic rather than systemic progress.

Perceptions of management readiness diverged sharply, but footwear management shows the most openness to climate adaptation, while Leather management remains the least responsive, posing a serious barrier to industry-wide transformation.

Opportunities for Climate-Resilient Factories

Despite these vulnerabilities, emerging opportunities signal pathways for climate-ready transformation. Certifications such as LEED (Leadership in Energy and Environmental Design) and LWG (Leather Working Group) are increasingly recognized across all sectors, offering leverage for global market access, compliance with Human Rights and Environmental Due Diligence (HREDD) requirements, and alignment with Environmental, Social, and Governance (ESG) standards. However, less than one-quarter of factories currently meet international sustainability benchmarks, reflecting an uneven distribution of resources and capacity. Certification remains concentrated among large, export-oriented factories, while small and informal units remain excluded from these opportunities. Furthermore, while global buyers exert pressure to accelerate compliance, they rarely invest in the transition, creating a widening gap between branding narratives and operational realities.

Policy and Institutional Readiness

Institutional and policy readiness provides a foundation. While RMG sector is supported by stronger policy

frameworks (NAP, NDC), and industry associations push green certification. Weakness lies in worker-level adaptation and cross-ministry coordination gaps. Regarding Leather & Footwear sectors, institutional mandates exist such as National Plan of Action on Social Compliance under MoLE but weaknesses dominate poor enforcement, non-functional CETP (Central Effluent Treatment Plant), weak waste management, skill gap and limited training from business associations. While RMG benefits from policy alignment and international buyer pressure, Leather and Footwear remain handicapped by structural inefficiencies, enforcement gaps, and inadequate support systems.

The findings highlight uneven industry readiness against climate change across Bangladesh's export sectors. RMG sector shows relatively balanced progress, stronger in waste management, flood resilience, and institutional frameworks, but weak in renewable energy adoption and worker-level adaptation. While leather sector faces serious readiness gaps including weak pollution control, low renewable energy adoption, low safety equipment of workers, poor safety committee presence, and resistant management attitudes. These issues are compounded by structural challenges like non-functional CETP. On the other hand, leather and footwear sector is emerging as more proactive in heat mitigation, ventilation, and management attitudes, with growing adoption of solar energy, but still lacking in water management and comprehensive waste recycling and solid waste management.

Overall, sustainability practices, climate-resilient measures, management attitudes, and institutional readiness are interconnected: sectors with stronger climate-focused management and infrastructure show higher adoption of environmental practices, while enforcement and training gaps limit uniform progress. These relationships suggest that improving institutional support, management commitment, and worker awareness could accelerate both climate adaptation and just transition goals in the RMG, Leather, Leathergoods and Footwear sectors.

Table 14: Industry Readiness against Climate Change

Themes	RMG Sector	Leather Sector	Footwear Sector
Sustainable / environmental practices	34.8% said factories consistently reduce environmental damage; 24.50% said reuse of materials to reduce waste; 47.30% said waste management or treatment system; 34.30% said compliance with internation sustainability standards	44.7% said no pollution-reduction efforts; 13.30% said reuse of materials to reduce waste; 15.30% said reduced use of chemicals in leather processing; 34% said waste management or treatment system; 20% said compliance with internation sustainability standards	44% said factories reduce pollution consistently and 16.7% only in some areas; Adoption of solar and eco-machinery stronger, but water-related sustainability weaker than RMG/Leather
Climate-resilient measures at factory	69.50% said factories taken initiatives to reduce heat-stress; 70.8% said cooling and ventilation system; 15.80% said energy-efficiency machinery; 76% said flood barriers or drainage system;	85.3% said factories taken initiatives to reduce heat-stress; 50.70% said cooling and ventilation system; 27.30% said energy-efficiency machinery; 59.70% said flood barriers or drainage system;	92% said factories taken initiatives to reduce heat-stress; 92% said cooling and ventilation system; 36% said energy-efficiency machinery; 38.60% said flood barriers or drainage system;

	77% said reinforced buildings to withstand extreme weather; 28% said water management system; 20.50% saif renewable energy sources	85.30% said reinforced buildings to withstand extreme weather; 18.70% said water management system; 7.30% said use of renewable energy sources	37.30% said solar energy; 1.30% said rainwater harvesting; 14.70% said waste-waste recycling;
Opportunity for Climate-resilient factory	LEED certifications rising (global best practice alignment); New business with international buyers; Aligning with HREDD reporting; Relevant certifications	LWG certifications rising (global best practice alignment); New business with international buyers; Aligning with HREDD reporting; Relevant certifications	LWG certifications rising (global best practice alignment); New business with international buyers; Aligning with HREDD reporting; Relevant certifications
Safety committees	89.5% said committees exist; 53.4% said committees raise climate awareness	30.15% said committees exist; Limited climate-related awareness found	85% said committees exist; 47.3% said committees address climate issues; Often undertrained/inactive on climate risks
Social protection at place	14.3% reported no benefits; 13.40% with health insurance; 13.80% with pension plans; 10.70% with disability benefits; 47.80% with maternity benefits; 5.4% with injury benefits	71.8% reported no benefits; 6.5% with health insurance; 3.3% with pension plans; 7.3% disability allowance; 4.70% with maternity benefits; 6.4% with injury benefits	75.3% reported no benefits; 6.7% with health insurance; 3.8% with pension plans; 2.3% disability allowance; 6.6% with maternity benefits; 5.3% with injury benefits
Management Attitude to Climate-resilient	34.8% said positive	24.7% said positive	52.7% said positive
Policy & institutional readiness	Strong frameworks (NAP, NDC), Industry associations promote green certification, Weak worker-level adaptation and coordination gaps across ministries	Institutions have mandates (MoEFCC, MoLE, DoL, DoE and DIFE) but Weak enforcement, Non-functional CETP, and Weak waste management system, Limited training from Business Associations	Institutions have mandates (MoEFCC, MoLE, DoL, DoE and DIFE) but Weak enforcement, Non-functional CETP, and a Weak waste management system, Limited training from Business Associations

4.8.1 Insights from the RMG Sector

Readiness in the RMG sector is moderate but uneven. Some facilities have implemented structural adaptations, such as raised factory foundations and water barriers, to mitigate flooding, alongside operational changes like frequent water breaks and passive cooling (e.g., ventilation and shading). The sector has also made strides in decarbonization: the Partnership for Cleaner Textile (PaCT) program, supported by the International Finance Corporation (IFC), has aided 488 factories in energy efficiency, saving 3.8 million MWh annually and avoiding 0.7 million tons of GHG emissions. Renewable energy adoption is growing, with solar PV installations (e.g., GIZ's program targeting 8% GHG reduction) and pledges from brands like H&M and Bestseller for offshore wind investments. These findings reveal that Bangladesh's RMG industry is in a transitional stage of readiness to address climate change, showing both progress and persistent gaps across sustainable practices, climate-resilient infrastructure, workplace safety, and institutional alignment.

Sustainable and Environmental Practices

Only 34.8% of respondents felt their factory took steps to reduce environmental damage, while 21.3% reported no measures at all. Waste treatment systems (47.3%), international sustainability certifications (34.3%), and material reuse (24.5%) were among the most cited practices. Approximately 69.5% of workers reported heat stress mitigation measures, whereas 30.5% indicated no such initiatives. Interventions like fans, saline, and cooling drinks are introduced in some factories. One worker explained, *"When it gets hot, there have adjustable fans. When it gets really hot, they provide lemon juice for the workers, which helps them feel a bit better" (Worker, FGD). Others noted inconsistency "Not all places (garments) provide these In some places, the owner gives saline, while others offer sherbet"* (Worker, FGD). This illustrates how climate responses are fragmented and largely dependent on factory-level initiatives rather than systematic industry practice. A BKMEA informant highlighted improvements in green-certified factories *"We've ensured elevated buildings, improved ventilation systems, and even solar power in many of our green-certified factories. These changes have made the work environment more tolerable, especially during heat waves."*

"Now, at the packing area, there's an air suction system that pulls the waste directly into a bag" (Worker, FGD). Industry experts confirmed that some factories have adopted solar power, ETPs, and rainwater harvesting, but these remain limited in scale. A mid-level manager stated "So, overall, we are all moving towards green energy, installing solar panels, and setting up ETPs to reduce surface water use. We're using recycled water more. Also, we can reserve rainwater and use it when it's needed." Similarly, other innovations such as air suction systems, solar backup power, and water recycling were noted, suggesting that while adoption is underway, integration is still uneven across factories. *"We often talk about green economy or zero carbon, but we haven't really achieved that- If we can do similar things like purifying wastewater instead of letting it drain away, we need to bring in these kinds of initiatives."* (Management, KII).

Bangladesh currently has over 261 LEED-certified green factories (over 100 Platinum, over 100 Gold, rest is Silver) (BSS, 2025), helping reduce energy and water use. For example, DBL Group's LEED Platinum factory saves 40% energy and 35% water (USGBC, 2022). A management informant noted the limitations of solar power *"Solar power does exist in Bangladesh, but it hasn't been able to supply electricity on a large scale. The amount of electricity needed in the RMG sector hasn't really been met by solar power. But if it could be supplied, it would have been good for everyone - both the factory owners and all of us involved"* (Management, KII).

Climate-Resilient Infrastructure

The sector demonstrates notable adaptation measures. Seventy-seven percent of workers reported reinforced buildings, 76% cited flood barriers or drainage systems, 70.8% mentioned cooling and ventilation systems, while smaller proportions noted energy-efficient equipment (15.8%) and renewable energy (20.5%). Worker testimonies confirmed these findings "We have adjustable fans. Also, we have enough ventilation" (Worker, FGD). Others stressed inconsistency. Physical resilience measures are often basic, fragmented, and concentrated in larger or certified factories. A management informant explained, *"We are planning to plant greenery along the factory boundaries as part of our green initiatives, with the aim of covering the entire factory in vegetation. This will help reduce internal heat. Additionally, we're focusing on the roof, which has ample open space. We are planting various types of trees and plants there, which could reduce the heat from above by up to 70%. It's a major plan, and if*

the government supports us with tree plantation, it will make the process much easier."

Key Examples on Climate-resilient Initiatives

- **Low-Cost Financing Options:** Through partnerships with development banks, green finance schemes (e.g., Green Transformation Fund, IDCOL Renewable Energy Program, InSPIRE Project) (ORDNUR, 2025).
- **Process Optimization:** Lean Manufacturing Principles, Heat Recovery Systems, and Building Insulation & Natural Ventilation
- **Employment Injury Scheme Pilot:** Provides compensation for climate-related injuries, funded by 0.019% of export volumes from brands.
- **Higg Index Adoption:** Many export-oriented factories use Higg FEM (Facility Environmental Module), driven by global brands like H&M, Zara, and Walmart.
- **Renewable Energy Pilots:** Solar rooftops at Ananta Group (2 MWp), Pacific Jeans (32.70 MW) and reduces annual CO_2 emissions by over 6,000 tones, Body Fashion Limited (558 kWp), Envoy Textiles (1.1 MWp); however, <5% of factories use renewables at scale (RE100 Bangladesh Report, 2023 & ORDNUR, 2025). Factories report up to 30–40% savings on power costs after switching to solar.
- **Energy Efficiency Programme:** PaCT (Partnership for Cleaner Textile) by IFC supported 200+ factories in water/energy efficiency, saving 15 billion liters of water and 120 GWh energy (IFC PaCT Phase II Report, 2022).
- **Worker Heat Stress Mitigation:** Some factories installed cooling systems and adjusted shifts during heatwaves (MAS Holdings pilot, Gazipur, 2023).
- Technological Upgrades: IoT & Smart Monitoring Systems, LED Lighting Systems, and Variable Frequency Drives (VFDs)
- **Sustainable Cotton Sourcing:** Factories are increasingly sourcing organic and sustainably grown cotton. The initiative's goal to increase the industry's use of more sustainable cotton from 30% to over 50% **by 2025 (Textile Exchange, 2025).**
- **Green Packaging:** The market for biodegradable and recyclable packaging is rapidly expanding. This rise demonstrates that companies and manufacturers are investing in and implementing biodegradable and recyclable packaging materials.
- **Waste Minimization through Fabric Cutting Optimization:** Some factories have adopted digital pattern-making technology, reducing fabric waste by up to 10%. This approach not only cuts costs but also minimizes landfill waste (Sustainability Directory, 2025).

Safety Committees

Safety structures are comparatively well-established, with 89.5% of workers confirming the presence of safety committees, though only 53.4% stated that these committees raise climate-related awareness. A worker explained "We receive no safety training regarding climatic events. The only safety training provided is fire safety" (Worker, FGD). This suggests that while institutional mechanisms exist, they are not fully leveraged for climate-resilient practices.

Social Protection at Place

In the social protection front, the RMG sector shows moderate progress compared to other sectors. While 14.3% of workers reported having no benefits at all, nearly half (47.8%) have access to maternity benefits a relatively strong indicator in a female-dominated workforce. However, coverage for long-term security remains weak: only 13.4% have health insurance and 13.8% have pension plans, with disability benefits reaching just 10.7%. This reveals a gap between basic, legally mandated protection and comprehensive, sustainable social safety nets. A DIFE informant explained ongoing policy discussions *"There are indeed discussions on how to manage workers once their jobs end or when they reach the age of sixty or sixty-five, and whether they (workers) can adapt to automation even with training. It would be helpful if some kind of monthly benefit system could be arranged for them."* This indicates both recognition of gaps and the need for broader, more inclusive safety nets.

Management Perceptions

Management attitudes toward climate resilience remain cautious, with only 34.8% reporting a positive approach. Some mid-level managers acknowledged progress in solar energy and compliance upgrades, while others noted that investments often stem from external buyer demands rather than internal prioritization. A mid-level manager said *"Every factory will have a solar system. As long as electricity is available, the power supply will be maintained. If the electricity goes out, we will run a diesel generator. If there is no diesel generator, we will use solar. Sustainable practices are insufficient, with weak compliance leading to continued environmental degradation"* (Management, KII). About 50% of workers never received climate-related training.

Policy and Institutional Readiness

Policy and institutional frameworks provide a relatively strong enabling environment. National plans such as the National Adaptation Plan (NAP) and Nationally Determined Contributions (NDCs), coupled with industry-led green certification drives like LEED, are positioning the RMG sector within the best global practices. However, coordination gaps across ministries and weak integration of worker-level adaptation limit practical workplace resilience. A BKMEA representative emphasized *"Buyers, government, civil society everyone must work from the same script. Otherwise, the transition will leave many behind"* (BKMEA).

Despite these challenges, opportunities exist. Rising LEED certifications, alignment with HREDD (Human Rights and Environmental Due Diligence) reporting, and growing international buyer requirements incentivize factories to improve environmental performance. One informant noted, *"Job insecurity is common as climate impacts warsening livelihoods, pushing many to migrate without adequate social protections"* (Mid-Level-Management, KII).

Circular practices include waterless dyeing (reducing energy use by 30–85% at firms like DBL Group) and ozone finishing (cutting GHG emissions by 40% at Nice Denim).

Challenges persist: high upfront costs ($1.5–3 million for water-efficient dyeing), limited access to finance for SMEs, policy gaps (solar capacity restrictions), and low worker involvement hinder scalability. Without accelerated just transitions, scenarios like “Scorched Earth” could lead to 20% job losses by 2050, while “Green Forest” pathways with renewables and social protections could preserve competitiveness.

International comparisons highlight gaps. Vietnam’s VITAS & ILO Green Factory Program embeds adaptation at the factory level, and India’s ZED scheme links green compliance with incentives. Bangladesh’s approach remains largely buyer-driven, promoting LEED certification without systematic integration of worker protections.

Overall, the RMG industry demonstrates partial readiness. Structural progress is evident in environmental practices and climate-resilient infrastructure, but inconsistencies, limited worker awareness, and fragmented institutional coordination constrain the ability to deliver a holistic just transition. Strengthening worker-centered adaptation, scaling training programs, and embedding accountability mechanisms across supply chains remain critical to ensure
that climate readiness translates into sustainable, equitable outcomes for workers.

Table 15: Institutional and Policy Mapping for Climate Resilience in RMG sectors

Institution / Ministry	Role in Climate Resilience for RMG	Relevant Policies / Frameworks	Institutional Capacity & Gaps	Factory-Level Actions / Initiatives
MoEFCC	Leads national climate policies, adaptation plans, and coordinates NDC/NAP	NAP 2023–2050, BCCSAP 2009, NDC 2021	Strong policy lead but limited engagement at the factory level; poor integration with	Occasional collaboration with DoE for audits; lacks systematic RMG factory engagement
MoLE	Ensures occupational health, worker safety, and social protection	Labour Act 2006-OSH Policy	Mandate on health & safety, but lacks technical integration of climate-induced risks	Minimal factory-level climate health inspections; OSH training excludes climate factors

MoInd	Industrial policy formulation, governance of industrial zones	Industrial Policy 2022	Capacity for coordination with RMG associations; weak on climate compliance	Limited participation in climate retrofitting initiatives; no structured factory-level climate plan
MoCom	Oversees export strategies and ESG alignment with global buyers	Export Policy 2021–24	Growing awareness of Environmental, Social, and Governance/green standards, but lacks a labour-climate lens	No concrete RMG factory program; climate issues treated as trade barrier, not labour risk
MoTJ	Governs textile and RMG sector development and training	Textile Policy 2017	Focus on productivity and exports; limited focus on sustainability or climate resilience	Training institutions under the MoTJ rarely include climate adaptation in the curriculum
DoE	Environmental monitoring and ETP clearance for RMG factories	ECR 1997	Enforcement is often weak due to staffing and monitoring limitations	Periodic audits of ETPs lack proactive engagement in climate hazard zones
BGMEA / BKMEA	Lead industry associations, ensuring compliance, advocacy, and green factory certification	Partnerships: IFC, ILO, GGGI (LEED, etc.)	Strong in green factory rollouts; lacks direct climate adaptation integration at the worker level	LEED-certified factory programs; pilot ventilation and waste reduction projects
NSDA	Supports workers upskilling, transition to green jobs	National Skills Framework	Capacity exists, but limited coordination with climate-relevant programs	Potential for green job curriculum development; pilots under ILO/GIZ not yet scaled

Table 16: Comparative International Models regarding RMG

Country	Model / Initiative	Focus Area	Relevance to Bangladesh	
			Initiative	Scope
Vietnam	VITAS–ILO Green Factory Program	Sustainability, cleaner production, skills development, and labour rights	Bangladesh-Green Factory Award: Environmental compliance (ETP, waste management), OSH, energy use, workplace environment, social protection	Demonstrates coordinated efforts among industry, labour, and international partners to build factory-level adaptation.

India	ZED Scheme (Zero Defect, Zero Effect)	Quality control, lean process, energy/waste efficiency, environmental safety	Better Work Bangladesh (ILO–IFC): Occupational Safety and Health (OSH), Decent Work and Labour Rights, Social Dialogue and Industrial Relations, Skills Development and Gender Equality, Policy Reform and Institutional Strengthening	Offers a national compliance-linked model that rewards greener production and a better working environment in RMG.
Indonesia	Green RMG Cluster Pilot (West Java)	Circular Textile Production, Green Skills and Workforce Development, Sustainable Investment and Innovation	Green Industrial Zones / Economic Zones (BEZA-led): Sustainable Resource Management, Pollution Control and Environmental Monitoring	Relevant for cluster-based planning and private-sector climate alignment.

4.8.2 Insights from Leather Sector

The findings highlight a mixed picture of the Leather industry's readiness for climate change, while climate resilient systems and some sustainable practices are present, gaps in functionality, awareness, and policy enforcement remain significant. Readiness is low to moderate, focused on pollution control and green transformation, but progress is slow due to incomplete infrastructure and financing barriers. The relocation to Savar Tannery Industrial Estate (ongoing since 2017) aims to centralize effluent treatment via a Common Effluent Treatment Plant (CETP), reducing pollution by 30-40%, though full operation is delayed.

Sustainable and Environmental Practices

Pollution reduction and sustainable practices remain underdeveloped across the sector. Nearly half of workers (44.7%) said no pollution-reduction initiatives had been implemented, while 52% reported no sustainable practices at all in their factories. Waste management systems were present in only 34% of cases, with reduced chemical use (15.3%), material reuse (13.3%), and compliance with international standards (20%) even less common. Workers often doubted the efficacy of existing systems, *"We've heard about waste treatment plans and how chemicals should be managed. But have you seen where they dump it? There's a treatment plant, but not everything goes through, especially at night."*

Despite these shortcomings, some promising practices are emerging. A few factories have initiated chromium-free leather processing, rooftop solar panels, and rainwater harvesting. For instance, one tannery has established rainwater collection for both drinking and operational purposes: "We try to preserve the rainwater because it's much better than the water we normally get here." Larger companies like Apex have implemented full-scale rooftop solar systems, generating surplus electricity for the grid. Furthermore, compliance officers reported adopting ISO 45001 (Occupational Health and Safety) and ISO 9001 (Quality Management Systems), signalling an alignment with international standards, though these remain limited to a small number of firms.

The Ethical Trading Initiative's (ETI) 2024-2026 project targets 40 tanneries for Environmental and Social Management Systems (ESMS) and Human Rights Due Diligence (HREDD), improving OHS and resource efficiency to meet Leather Working Group (LWG) standards. Sustainable practices include chemical substitution (15% reduction in hazardous ammonium compounds) and waste valorisation for carbon neutrality. Government efforts, like the 2025 Renewable Energy Policy's tax

incentives, support solar adoption, but uptake is limited. Challenges include high costs for green tech, weak enforcement, and health impacts from carbon-intensive processes, with projections showing potential $26.8 billion export losses by 2030 without adaptation.

Climate-Resilient Infrastructure

Most workers (85.3%) acknowledged that their factories had reinforced buildings designed to withstand extreme weather, suggesting some level of structural preparedness. Similarly, 59.7% cited flood protection measures such as drainage systems, while 50.7% reported ventilation and cooling facilities. Yet, qualitative accounts revealed significant functional gaps. One worker highlighted the inadequacy of heat mitigation "The buildings are new and safer, but the inside gets unbearably hot during summer. We sweat all day some fans don't even work properly. So, what's the point of a new structure if it can't protect us from the heat?" Likewise, frequent flooding during heavy rainfall undermines drainage capacity *"When the rainy season comes, some parts of the factory get flooded. There are drains, yes, but they overflow quickly. We have to walk through dirty water affecting our health and the leather quality."* One worker complained, *"When the rainy season comes, some parts of the factory get flooded… we have to walk through dirty water"* (Worker, FGD).

More advanced measures such as energy-efficient machinery (27.3%), water management systems (18.7%), and renewable energy sources (7.3%) were far less common. While some managers reported efforts to improve ventilation "During extreme heat, suffocation becomes a serious issue inside the tannery. So, we've tried to keep the entire area well-ventilated, even more than the minimum requirement. We've installed several additional fans" these examples were exceptions rather than the rule.

Key Examples on Climate-resilient Initiatives

- **Central Effluent Treatment Plant (CETP):** STIE's CETP treats 45,000 m³/day of wastewater, reducing pollution but still energy-intensive and not climate-resilient (DoE, 2023).
- **Individual ETP:** Six companies have been given permission to build ETP of their own and another eight to 10 tanneries are in the process of getting approval. In addition, Sadar Tannery Ltd. completed and is now operating a fully functional ETP, while Simona Tanning Ltd. continues to maintain a functional ETP as part of its compliance measures.
- **Social and Environmental Certifications:** At Savar Tannery Estate, 7 tanneries hold BSCI certification, 5 have ISO 14001, 4 have ISO 45001, 2 are SA 8000-certified, 1 is SEDEX-certified, and 40 are actively pursuing LWG certification.
- **Water Recycling:** Some Bangladeshi tanneries use membrane filtration or reverse osmosis to recycle process water, reducing freshwater use and wastewater discharge. This enhances resilience to water scarcity and supports sustainable operations.
- **Solar Adoption:** Limited; only 3–5 large tanneries have pilot solar installations. Under the Re-Tie Bangladesh initiative, UNIDO implemented solar water heating and electrical efficiency enhancements in three tanneries.
- **Chemical Substitution:** Research at the Bangladesh Council of Scientific & Industrial Research has developed a chrome-free glutaraldehyde tanning process, and some tanneries are combining vegetable and chrome tanning to reduce chromium use
- **Planting trees and increasing greenery:** Planting trees and increasing greenery in the factory premises are now increasing rapidly to compensate the carbon footprint.
- **Zero Waste Initiatives:** Some tanneries have implemented zero-waste initiatives, transforming leather offcuts into new products such as wallets and accessories, thereby reducing landfill trash.

Safety Committee

The Leather sector presents a significantly weaker institutional framework. Only 30.15% of workplaces reported having safety committees, indicating a severe deficit in formal worker representation and safety oversight. Moreover, where committees do exist, there is "limited climate-related awareness found," suggesting that even when structures are present, they lack the capacity or mandate to address environmental or climate risks.

Social Protection at Place

Social protection coverage is alarmingly low: a staggering 76.5% of workers reported having no benefits whatsoever. Access to basic protection like health insurance (6.5%), pensions (3.3%), and disability allowance (7.3%) are minimal. Injury benefits, critical in a sector known for hazardous chemical exposure and physical risks, reach only 6.4% of workers. This paints a picture of systemic

neglect, where both institutional safeguards and social welfare mechanisms are largely absent or non-functional. As onecompliance officer acknowledged, *"Social protection is only possible through proper implementation of labour laws."*

Management Attitudes

Workers' perceptions of management commitment to climate resilience are divided. Only 24.7% reported that management takes climate change seriously, while 29.3% observed no action at all. As one civil society representative observed, *"Sustainability efforts are mostly buyer-driven. Without that external pressure or support, many factories wouldn't invest in these upgrades voluntarily"* (CSO, KII). Another 24.7% felt efforts were insufficient, and 21.3% were uncertain, reflecting weak communication and limited transparency. As one leather manager admitted "Climate change has an impact. But to be honest, I haven't seen much work being done on this issue. You are the first ones I've seen to come and ask about it." A representative from NSDA added *"This climate change is happening very slowly; our management and workers haven't been able to grasp it yet… the number of factories thinking about climate change can be counted on fingers."*

Policy and Institutional Readiness

Despite these gaps, there are clear opportunities for progress. Rising demand for Leather Working Group (LWG) certification, as well as compliance with EU Human Rights and Environmental Due Diligence (HREDD) requirements, presents a strong business case for cleaner and more climate-resilient production. Many workers (93.3%) agreed that stronger policies and enforcement mechanisms are necessary. As one compliance officer stated *"A policy must be formulated otherwise, adaptation to climate change is impossible. The government needs to be more responsible."I*nternational experiences provide further lessons. India demonstrates the potential of factory-level reforms through cleaner production initiatives; Vietnam highlights the role of buyer-driven certification systems; and Ethiopia's circular economy and eco-leather innovation showcase pathways for sustainable competitiveness. For Bangladesh, aligning with such models while strengthening domestic enforcement, improving training, and incentivizing green investments could accelerate the sector's readiness for a climate-resilient future.

Table 17: Institutional and Policy Mapping for Climate Resilience in the Leather sector

Institution / Ministry	Role in Climate Resilience for Leather	Relevant Policies / Frameworks	Institutional Capacity & Gaps	Factory-Level Actions / Initiatives
MoEFCC	Coordinates national climate strategy; monitors pollution and industrial impacts	NAP 2023–2050, BCCSAP 2009, NDC 2021	Present in policy, but factory-level oversight is weak, especially in leather clusters.	Occasional policy workshops; lacks leather specific outreach or support mechanisms
MoLE	Manages OSH, social protection, and gender-responsive labour practices	Labour Act 2006- OSH Policy	Limited engagement in chemically hazardous, climate-exposed tannery zones	Minimal field-level climate health surveillance in leather units
MoInd	Oversees tannery relocation, industrial safety, and productivity	Industrial Policy 2022	Poor track record in ensuring compliance; weak ETP and waste management governance	Oversight of the tannery industrial state is weak; factory-level follow-up is rare.

MoCom	Trade and export development aligns with international Environmental, Social, and Governance, and pollution standards.	Export Policy 2021–2024	Recognizes buyer pressure but lacks domestic enforcement mechanisms	No direct engagement with tanneries on climate-linked export standards
BSCIC	Manages Savar Tannery Industrial Estate (STIE) infrastructure and relocation	STIE Management Guidelines	Severe capacity constraints in waste management, water treatment, and factory monitoring	Incomplete ETP functionality at STIE; limited on-site climate hazard monitoring
DoE	Monitors pollution control (air, water, waste), grants ETP clearance	ECR 1997	Understaffed; limited tannery-specific enforcement	Some ETP inspections; no tannery-specific climate risk response protocol
BTA / BFLLFEA / LFMEAB	Sectoral associations for exporters, training, and advocacy	Leather Export Roadmap, LWG Certification	Growing capacity but weak on labour-climate integration and factory adaptation	Some training on cleaner production, limited direct action on worker climate risks
NSDA	Supports re-skilling for green transitions (e.g., eco-leather)	National Skills Development Strategy	Not yet integrated into leather-specific climate adaptation programs	Green jobs pilot programs in design; no scaled training on tannery climate resilience

Table 18: Comparative International Models regarding Leather

Country	Model / Initiative	Focus Area	Relevance to Bangladesh	
			Initiative	Scope
India	UNIDO-GIZ Cleaner Leather Production (Kanpur, Tamil Nadu)	Resource efficiency, wastewater treatment improvement, capacity building and training, policy and regulatory support	Good Working Conditions in Tanneries (GOTAN Project): Environmental Compliance, Gap assessment, and Corrective action	Highlights factory-level climate-health integration and tannery cluster reforms.
Vietnam	LWG Certification & Cleaner Production Adoption	Environmental compliance, green auditing, buyer compliance, resource efficiency, social compliance, and occupational health & safety	Bangladesh Leather Working Group (BLWG)	Shows how buyer-led certification can push cleaner leather manufacturing.
Ethiopia	Africa Leather and Leather Products Institute (ALLPI): to support and develop the leather sector across Africa	Sustainability, compliance, training, cluster upgrading, and eco-leather promotion	Cleaner production and circular economy model: environmental sustainability, resource efficiency, and compliance	Demonstrates regionally aligned leather transition strategy.

4.8.3 Insights from Leathergoods and Footwear Sector

Readiness is emerging but constrained by barriers to Green Supply Chain Management (GSCM), with only partial adoption of sustainable practices. Eco-labelling schemes (24 SMEs via ECOLEBAN) promote low-chemical products, reducing COD and enabling market access. Resource efficiency efforts cut solid waste by 10% and enable finance access for 20 SMEs in green machinery. The Leather, Footwear, and Leather Products Sectorial Committee (CSC-4) develops SCP standards, and guidelines for ISO 14001 implementation support lifecycle assessments. The leathergoods and footwear sector reflect a mix of emerging readiness, skill gaps and waste management issues, and persistent vulnerabilities in advancing toward a just transition. GSCM obstacles like high costs and policy gaps persist, with factories lacking heat allowances or AC (59% without fans). Projections suggest 8.9% annual market growth to $7.3 billion by 2026 if green transformation accelerates, but climate inaction could amplify losses.

Sustainable and Environmental Practices

About 44% of workers reported consistent pollution reduction efforts in their factories, while 16.7% observed such initiatives only in some areas. Compared to the leather sector, footwear factories demonstrated stronger adoption of solar energy and eco-friendly machinery 36%, though water-related sustainability practices such as rainwater harvesting 1.3% or waste-water recycling 14.7% remains minimal.Most workers 88% expressed interest in green job training, particularly in entrepreneurship, safe chemical use, and energy-efficient technologies.

A business association representative mentioned, *"Under regulatory pressure, individual factories are pushing for*

the use of advanced technologies. Their goal is to ensure the industry's long-term sustainability while reducing its negative effects on the environment." These insights confirm this gap; noting is visible progress in cleaner production processes but persistent challenges in effective water treatment and environmental compliance.

Climate-Resilient Measures in Factories

Climate resilience emerged as a relatively stronger dimension in this sector. An overwhelming majority (92%) of workers reported that their factories had taken initiatives to reduce heat stress through heat-resistant ventilation systems. In addition, 37.3% cited solar energy adoption, and 36% mentioned eco-friendly machinery integration. Yet, the scope of these measures remains uneven, with more advanced interventions concentrated in larger export-oriented firms. Despite these infrastructural investments, workers continued to express anxiety about job losses due to technological upgrades and automation, with nearly half 48.7% fearing displacement without proper safeguards. Regarding this a Trade Union representative stated, *"Some larger firms are adding solar power and eco-friendly machines, but smaller ones lag behind. Still, many workers worry that automation could replace us if safeguards are not in place."*

Key Examples on Climate-resilient Initiatives

- **Sustainability Reporting (LFMEAB 2019-ongoing):** Enhances resource efficiency across the value chain, with 100+ SMEs adopting SCP, reducing medical leaves by 20% via safer chemicals.
- **Climate-Resilient Urban Measures:** Calls for green infrastructure like cooling shelters, as in BMC studies, to protect workers from heat in production hubs.
- **Product-Level Sustainability:** Companies like Apex Footwear and Bata Bangladesh are introducing recycled materials (recycled PU, bio-based soles) and eco-packaging.
- **Energy Efficiency:** Medium-scale manufacturers adopting LED lighting and efficient motors under IFC's *"Lighting Bangladesh"* program.
- **Export Compliance:** Meeting EU's CBAM (Carbon Border Adjustment Mechanism) prep requirements (Walton Footwear started carbon footprint assessments, 2023).
- **Circular Economy Pilots:** Haute Leathers (Dhaka) launched upcycled leather bags using factory offcuts reducing waste and emissions.
- **Eco-Friendly Adhesives and Solvents:** Footwear producers are increasingly adopting eco-friendly adhesives and solvents that are less damaging to both workers and the environment. This shift helps to reduce the toxic impact of traditional chemicals used in footwear production (Samad Adhesive, 2025)

Safety Committee

The Footwear sector mirrors the Leather sector in many respects but with marginally better committee presence with 85% reported safety committees exist. However, functionality remains questionable: only 47.3% said these committees address climate issues, and they are often described as "undertrained" or "inactive on climate risks." This implies that while formal structures may be more widespread than in Leather, their operational effectiveness particularly on emerging issues like climate adaptation is severely lacking.

Social Protection at Place

Social protection is similarly inadequate: 84.2% of workers reported no benefits at all. Health insurance (6.7%) and pension coverage (3.8%) are negligible, and injury benefits which are crucial in a physically demanding manufacturing environment reach only 5.3%. The data suggests that despite higher committee presence, the sector fails to translate structural existence into meaningful worker protection or climate resilience.

Management Attitudes and Policy Readiness

Compared to other sectors, management attitudes in the footwear industry showed moderate readiness, with 52.7% of workers reporting a positive stance toward climate resilience. However, as in the leather sector, policy and institutional readiness remains constrained by weak enforcement, non-functional waste management systems, and insufficient training programs from business associations. *"Management in many footwear factories talk positively about climate resilience, and some efforts are visible. But weak enforcement, poor waste systems, and lack of proper training mean policies often stay on paper and are not fully practiced on the floor"*(Worker, FGD). This creates a gap between compliance on paper and actual practice at factory level.

Policy and Institutional Readiness

Despite gaps, the leathergoods and footwear sector has strong opportunities to advance climate resilience. Growing demand for LWG certification and compliance

with EU HREDD standards provides a clear business case for greener production. Rising interest in solar energy, eco-machinery, and heat-resistant ventilation underscores the feasibility of scaling climate-smart infrastructure. Worker readiness is also high, with 88% expressing interest in green training. Global lessons highlight clear pathways: Vietnam's RECP initiatives showcase cleaner production and energy efficiency; India emphasizes buyer-driven compliance and technology upgrading; Indonesia's Better Work program links OSH with climate-related risks; and Brazil's cluster model demonstrates the benefits of collective green management. A significant majority (74%) reported no training on climate or sustainability, while job loss fears were high (48.7%), compounded by inadequate infrastructure and wage concerns. One of the stakeholders stated, *"Greener production is now a business necessity buyers demand it and workers want training. But without strong enforcement and real investment, climate resilience in footwear will remain only on paper".*

In Bangladesh, while climate concerns are reflected in national frameworks like the NAP and NDC, footwear-specific strategies remain absent, and enforcement is weak. Institutions such as MoInd and MoCom recognize footwear as a priority export sector but have yet to integrate climate resilience as a competitiveness factor. Associations like LFMEAB are emerging as convenors, yet structured climate-resilience programs remain limited. Weak monitoring, fragmented mandates, and lack of climate-proofing in economic zones further constrain progress. Aligning with international models while strengthening domestic enforcement, incentivizing green investments, and embedding climate-linked worker protections will be critical for accelerating the sector's readiness for a climate-resilient future.

Table 19: Institutional and Policy Mapping for Climate Resilience in Footwear sector

Institution / Ministry	Role in Climate Resilience for Footwear	Relevant Policies / Frameworks	Institutional Capacity & Gaps	Factory-Level Actions / Initiatives
MoEFCC	Integrates climate risk into national development; supports industry adaptation & energy efficiency including footwear	NAP 2023–2050; NDC 2021; BCCSAP 2009	Policies exist, but weak regarding footwear-specific climate guidelines; limited factory-level integration	Occasional awareness drives; green factory certification pilots in footwear (mostly buyer-led)
MoLE	Ensures labour rights, OSH in footwear factories (heat stress, chemical exposure from adhesives, poor ventilation)	Bangladesh Labour Act 2006 & Rules; National OSH Policy (2013), National Labour Policy (2012)	General OSH coverage, but climate-linked hazards (heat, air quality) under-addressed (not yet addressed systematically)	Factory trainings on PPE, ventilation, chemical handling; very limited programs on heatwave preparedness, Occasional training sessions on occupational safety.

MoInd	Industrial development and competitiveness of footwear sector	Industrial Policy 2022; Export Competitiveness Strategy, National Productivity Master Plan (2021–2030)	Promotes export diversification; lacks climate-resilience incentives for footwear	Pilot energy audits, machinery upgrades; limited incentives for cool-roofing, renewable integration
MoCom	Export diversification, trade promotion, and buyer compliance in footwear	Export Policy 2021–24	Policies highlight footwear as a priority sector, but climate resilience not framed as competitiveness factor	Compliance meetings with buyers (social/chemical issues); climate adaptation not yet embedded
DoE	Regulates environmental performance of footwear factories (air, waste, chemicals)	ECA/ECR; DoE Industrial Guidelines.	Monitoring capacity limited; footwear factories often below radar compared to tanneries/RMG	Occasional compliance checks; no structured climate risk or air quality monitoring specific to footwear
BEZA / BIDA	Supports export zones, investment promotion for footwear factories	Bangladesh Economic Zones Act (2010) Investment facilitation policies.	Facilitation role strong, but EZ design rarely integrates climate-proofing (heat, drainage, energy resilience)	EZ factories adopting solar rooftops, energy-efficient lighting; still ad-hoc basis
LFMEAB	Represents footwear exporters; advocates sustainability and green upgrading	MoUs with donors/buyers; compliance frameworks, MoCom Export Policy (2021–24)	Strong convening role; structured climate-resilience programs are still minimal	Energy efficiency, cleaner production pilots in footwear factories; limited scaling
BSTI	Standards for footwear quality, safety, and some environmental compliance	National standards; ISO alignment, National Quality Policy (2015)	Testing improving, but no climate-specific standards (e.g., IAQ, thermal comfort benchmarks)	Certification/testing; could expand to cover energy/ventilation/climate resilience
NSDA	Skills training for footwear workforce	National Skills Framework; sectoral skills programs; NSDA Strategic Plan (2020–2030)	Few programs focused on climate-smart or green jobs in footwear	Emerging training on occupational safety, energy efficiency, and eco-design

Table 20: Comparative International Models regarding Footwear

Country	Model / Initiative	Focus Area	Relevance to Bangladesh
Vietnam	LEFASO + UNIDO Footwear RECP projects	Cleaner production, energy efficiency, waste reduction in footwear factories	Demonstrates industry-wide RECP adoption; Bangladesh can replicate via LFMEAB
India	Council for Leather Exports footwear programs	Energy audits, waste minimization, OSH in footwear plants; Infrastructure Development & Footwear Complexes; Technology Upgradation & Innovation	Offers lessons on buyer-driven compliance in footwear; applicable to Bangladesh
Indonesia	Better Work Footwear program by ILO	OSH, social compliance in footwear, Improving Working Conditions	Focused on worker safety including heat stress; Bangladesh can learn for worker-centric adaptation
Brazil	Vale do Sinos Footwear Cluster	Environmental compliance and competitiveness in footwear	Illustrates how regional footwear clusters can manage sustainability collectively
Ethiopia	Industrial-park programs for footwear exporters	Shared infrastructure, skills, green upgrading	Shows centralized services for footwear exporters; relevant for Bangladesh EZs

4. 9 Preparations for Just Transition Pathways

The findings highlight that workers across RMG, Leather, and Footwear sectors share core priorities higher wages, safer workplaces, health insurance, job security, and re-skilling but their emphasis differs by sectors. RMG workers prioritize job security and alternative livelihoods, with stronger reliance on brands and government for support. Leather workers emphasize health risks, chemical safety, and Trade union or NGO involvement, reflecting their exposure to hazardous workplaces. Footwear workers demand the highest level of support, particularly skills training, job security, and employer responsibility, revealing deep insecurities tied to climate-driven disruption.

Top Worker Priorities for Fair Transition

The findings reveal that workers' priorities for a just transition are deeply shaped by the immediate pressures of climate vulnerability, precarious employment, and weak social protection. Across the RMG, Leather, and Leathergoods & Footwear RMG, Leather, Leathergoods and Footwear sectors, higher wages (74%) emerged as the foremost demand not as a pursuit of upward mobility, but as a matter of survival in the face of climate-induced income shocks, rising food prices, and escalating medical expenses linked to heat stress and occupational illness. Health insurance and safer workplaces (57.3% each) are equally critical, underscoring that workers perceive climate change as a direct threat to their bodily integrity and well-being.

Job security (53.1%) remains a central concern as workers face the dual risks of automation and decarbonization without safety nets. The footwear sector demonstrates the highest urgency, with 95.2% demanding higher wages and 90.5% prioritizing alternative job training — clear indicators that these workers anticipate severe employment disruption under green transitions. Notably, climate-resilient workplace design (20.9%) ranks relatively low, not due to indifference but because workers regard such measures as a corporate responsibility rather than an individual demand.

Sectoral variations further reveal divergent vulnerabilities such as RMG workers emphasize job security (71.5%), alongside wages (66.8%), health insurance (52.3%), and re-skilling (39.8%). While Leather workers prioritize wages (72%), safer workplaces (67.3%), health insurance (61.3%), and training on climate adaptation (42%). On the other hand, Footwear workers show the most urgent and wide-ranging demands: higher wages (95.2%), alternative job training (90.5%), re-skilling (76.2%), and government support (66.7%).

This indicates that while all sectors seek better wages, protection, and safety, footwear workers face the most acute climate-driven job insecurity, while leather workers experience the greatest health-related vulnerabilities.

Health & Safety Priorities

Health and safety demands reflect workers' direct confrontation with climate-induced occupational hazards. Cooling and ventilation (74%) are the most urgent needs, followed by health insurance (62.7%) and adequate breaks during extreme heat (58.3%). These reflect the reality of rising workplace temperatures, dehydration, and heat-related illness. Mental health support remains a low priority (24%), despite widespread anxiety, depression, and trauma pointing to the normalization of psychological suffering in industrial labour.

Sectoral differences further highlight climate-health intersections such as RMG workers demand ventilation (71%), hydration (55.5%), breaks during heatwaves (68%), and mental health support (27.8%). While Leather workers emphasize cooling systems (70.7%), ventilation (56%), and health insurance (67.3%), reflecting the compound threat of heat and chemical exposure. On the other hand, Footwear workers demand the most comprehensive protections: universal calls for ventilation (100%), health insurance (90.5%), regular medical checkups (85.7%), and structured emergency responses.

These patterns indicate that while heat stress is the universal health concern, workers' responses vary depending on sector-specific vulnerabilities: chemicals in leather, multi-symptom fatigue in RMG, and extreme precarity in footwear.

Expected Supports from Global Brands

Workers perceive brands as critical actors in ensuring a fair transition but expect direct compensation and protection, not symbolic green commitments. The single most demanded intervention is brand-funded health insurance 65.3%, followed by protective equipment and hazard pay. Only a minority expect brands to finance reskilling 14–19%, underscoring that workers hold brands responsible for mitigating harm rather than building long-term resilience.

Sector-specific expectations highlight nuanced vulnerabilities such as RMG workers seek medical support65.5%, protective gear 48%, and hazard pay 34%. While Leather workers demand broader accountability, including medical insurance 69.3%, protective equipment 53.3%, eco-friendly technologies 41.3%, and compensation for health damage 49.3%. On the other hand, Footwear workers, aware of automation and decarbonization risks, call for skill development 65.3%, financial support 57.3%, and improved working conditions 54.7%. Overall, these findings demonstrate that workers expect brands to move beyond compliance and address climate and health risks as central to supply chain responsibility.

Supplier Responsibilities

Workers overwhelmingly identify suppliers as key duty-bearers in protecting their livelihoods. Job security 83.6% and fair wages 70.3% are considered non-negotiable. Importantly, reskilling 73.7% is prioritized almost as highly as wages, signalling recognition that climate and technological transitions are inevitable but must be managed equitably.

Highlighting the sectoral findings, RMG workers emphasize job security 83.3%, fair wages 62.7% and re-skilling 64%. While Leather workers prioritize re-skilling 78% and job creation in sustainable industries 45.3%. On the other hand, Footwear workers express the strongest demands, with universal calls for job security 95.2%, fair wages 100%, and re-skilling 95.2%.

This demonstrates that suppliers are seen not only as wage providers but also as agents of transition management, especially for vulnerable groups such as footwear workers.

Support Needed for Fair Transition

Workers view reskilling 88.2% as the single most essential safeguard in navigating climate and industrial transitions. This is framed not as career advancement but as a survival strategy in the face of inevitable job displacement. Government financial aid 57.2% is also critical, reflecting workers' inability to absorb wage shocks during transition periods. Finally, nearly half 49% demand stronger labour rights, linking fair transition to the broader struggle for decent work.

Highlighting the sectoral findings, RMG workers show the strongest on skill development & re-skilling 87.8%, with significant demand for government aid 53.3% and climate-friendly job replacement 48.8%. Leather workers also focus on re-skilling 84.7% and government aid 58.7%, plus strong emphasis on worker rights and protection 50%. On the other hand, Footwear workers indicate the highest again on skill development 92.7%, with higher expectations for government aid 66% than the other two sectors.Workers across all sectors prioritize skill development and re-skilling, with footwear workers showing the strongest demand, alongside significant expectations for government support and protections underscoring the urgent need for coordinated action to ensure a fair transition.

Workers' Interest in New Skills

The demand for new skills illustrates both vulnerability and adaptive aspiration. A majority of workers 71.3% express interest in entrepreneurship or alternative livelihoods, often as a last resort rather than a preferred pathway.

Sectoral interests reflect differentiated exposures such as RMG workers favour entrepreneurship 79.5%, indicating disillusionment with industrial employment. While Leather workers focus on technical upskilling in chemical safety 51.1%, energy-efficient technologies 39.4% and entrepreneurship 61.3%. On the other hand, Footwear workers balance entrepreneurship 59.3% with energy efficiency 40% and chemical handling 25.5%.

RMG workers want alternative livelihoods beyond the industry, leather workers focus on technical upskilling related to OSH and chemicals, while footwear workers seek a balance between technical and entrepreneurial pathways.

Responsible Bodies for Ensuring Fair Transition

Workers assign primary responsibility to employers 78.4%, not out of trust but due to their control over wages and working conditions. The government 57.3% is also expected to play a significant role, especially in financial support. Brands 44.3% are blamed for harmful practices but still viewed as responsible for providing reparative measures. Only 19.5% of workers see themselves as responsible actors, highlighting their structural disempowerment, while trade unions remain weak, particularly in leather and footwear.

Highlighting the sectoral findings, RMG sector places most

responsibility on employers 75%, followed by government 59.3% and brands 58.5%. Trade unions 18.5% and NGOs 10% have less recognition. While Leather sector shows similar employer focus 75.3%, but also higher expectations from trade unions 27.3% and NGOs 24.7%. On the other hand, Footwear sector indicates to extremely employer dependent 90.7%, while trust in government 50.7%, brands 26.7%, and unions 14.7% isrelatively low. Across all sectors, employers are viewed as the main duty-bearers, but RMG workers see brands as more esponsible, leather workers expect stronger Trade Union or NGO roles, and footwear workers show overwhelming reliance on employers. On of the informant stated, *"First of all, they leave behind their family bonding, and this can have a psychological effect. Housing is a big factor you'll see most garment factories are female-dominated, and they come alone. They may be socially abused, especially if they don't have proper housing. Also, they come with high hopes of earning some income. If all these mental stresses are present and there's no social security, they may face mental breakdowns or trauma. Because they are leaving their families and struggling to figure out how to live on their own."*

Table 21: Preparation of Just Transition Pathways

Themes	RMG Sector	Leather Sector	Footwear Sector
Top Worker Priorities for Fair Transition	Higher wages (66.8%), Safer workplace (55.3%), Health insurance (52.3%), Government assistance (40.30%), Job security (71.5%), Climate resilient workplace (24%), Alternative job training (56.40%), Re-skilling (39.80%)	Higher wages (72%), Safer workplace (67.30%), Health insurance (61.30%), Training on climate adaptation (42%),	Higher wages (95.2%), Safe workplace (52.4%), Health insurance (66.7%), Government assistance (66.7%), Job security (57.1%), Climate resilient workplace (33.3%), Alternative job training (90.5%), Re-skilling (76.2%), Training on climate adaptation (38.1%)
Health & Safety Priorities	Improved ventilation & cooling system (71%), Access to clean drinking water & hydration stations (55.50%), Regular health checkup and medical support (45.30%), Increased break times during extreme heat (68%), Protective gear for extreme weather conditions (34.30%), Emergency health response plans (39%), Health insurance coverage (50.50%), Awareness programs & training on health risks (38%), Mental health support caused by climate change (27.80%)	Improved ventilation system (56%), Cooling systems (70.7%), Safe and clean drinking water supply (41.3%), Adequate protective gear (mask, gloves, boots etc.) (39.3%), Health insurance or medical assistance (67.3%),	Improved ventilation & cooling system (100%), Access to clean drinking water & hydration station (66.7%), Regular health checkup and medical support (85.7%), Increased break times during extreme heat (90.5%), Protective gear for extreme weather conditions (42.9%), Emergency health response plans (47.6%), Health insurance coverage (90.5%), Awareness programs & training on health risks (61.9%) Mental health support caused by climate change (38.1%)

Expected support from Brands	Medical support & health insurance (65.5%), Safety training & better protective gear (48%), Investment in cleaner & safer technology (34%), Higher wages or hazard pay (34%), Compensation for health damage (37%), Transparency about environmental standards (15.80%)	Medical assistance and health insurance (69.30%), Safety training and better protective equipment (53.30%), Investment in eco-friendly and safe technologies (41.30%), Higher wages or risk allowance (44.70%), Compensation for health impacts (49.30%), Transparency about environmental standards (20%)	Medical assistance and health insurance (60.90%), Support in skill development and reskilling (65.30%), Improve working conditions and safety measures (54.70%), Providing financial support (57.30%)
Prioritized area to protect workers for Suppliers	Ensuring job security for workers (83.30%), Providing fair wages & financial support (62.70%), Creating new job opportunities in sustainable industry (34.80%), Offering skill development & reskilling programs (64%), Improving workplace safety & working condition (35.80%)	Ensuring job security for workers (72.70%), Providing fair wages & financial support (60.70%), Creating new job opportunities in sustainable industry (45.30%), Offering skill development & reskilling programs (78%), Improving workplace safety & working condition (35.30%)	Ensuring job security for workers (95.2%), Providing fair wages and financial support (100%), Creating new job opportunities in sustainable industry (61.9%), Offering skill development & reskilling programs (95.2%), Improving workplace safety & working conditions (61.9%)
Support needed for Fair Transition	Skill development & reskilling programs (87.80%), Govt. financial aid during job transition (53.30%), Job replacement in climate friendly industries (48.80%), Stronger labour rights & protections (48%)	Skill development & reskilling programs (84.70%), Govt. financial aid during job transition (58.70%), Assistance in finding jobs in eco-friendly sectors (46.70%), Strengthening worker rights & protection (50%), Improving health and safety (50%)	Skill development & reskilling programs (92.70%), Govt. financial aid during job transition (66%), Assistance in finding jobs in eco-friendly sectors (44%), Strengthening worker rights & protection (50.70%), Improving health and safety (35.30%)
Workers interested to new Skill Development	Safe handling of chemicals (19.20%), Use of energy efficient technology (31.30%), Entrepreneurship & alternative job skills (79.50%), Advanced training (3.40%)	Safe use of chemical & waste management (51.10%), Use of energy-efficient technology (39.40%), Entrepreneurship or alternative employment (61.30%)	Safe use of chemical & waste management (25.50%), Use of energy-efficient technology (40%), Entrepreneurship or alternative employment (59.30%)
Responsible bodies for ensuring a Fair Transition	Government (59.30%), Employers (75%), Trade unions (18.50%), NGOs/CSOs (10%), Workers (21.30%), Brands/Buyers (58.50%)	Government (58.70%), Employers (75.30%), Trade unions (27.30%), NGOs/CSOs (24.70%), Workers (32.70%), Brands/Buyers (24%)	Government (50.70%), Employers (90.70%), Trade unions (14.70%), Brands/Buyers (26.70%), Workers (1.40%)

4.9.1 Insights from RMG Sector

The RMG sector in Bangladesh demonstrates both the urgency and complexity of building climate resilience while ensuring a just transition for its workers. The study findings reveal that workers' top priorities for coping with climate challenges revolve around financial security, workplace safety, health protection, and job stability, underscoring their vulnerability to environmental shocks and technological shifts.

Top Worker Priorities for a Fair Transition

Workers in the RMG sector consistently identified job security, wages, and safety as their foremost priorities. Quantitative findings show that 71.5% prioritized job security, 66.8% higher wages, and 56.4% alternative job training, while 52.3% emphasized health insurance. These preferences underscore a dual concern: financial stability and protection from climate-related workplace risks. A male worker stated, *"A monthly salary of 25,000 taka, with the potential for overtime, would allow us (worker) to manage household expenses more effectively."* Similarly, a female worker highlighted systemic neglect of vulnerable groups, noting, *"Pregnant workers are forced to work 11 hours a day without any break"* (Worker, FGD). These testimonies reinforce the survey data that financial, safety, and social protections are the cornerstones of workers' resilience in the face of climate challenges.

Health and Safety Priorities

Climate change has made health and safety measures urgent, with 71% of workers calling for better ventilation and cooling systems, 68% for longer breaks during extreme heat, and 55.5% for hydration access. Over half also requested health insurance (50.5%) and regular medical checkups (45.3%). Worker testimonies vividly capture the lived reality *"We (workers) have ceiling fans above us… with the heat from the machines and so many people, it gets really hot. We face a lot of difficulty; we can't work properly, and we sweat excessively"* (Worker, FGD). Yet medical support remains inadequate. One female worker observed, *"They (management) only offer paracetamol, saline, or gastric medicine For serious injuries they tell us to go to a public hospital at our(workers) own cost."* This mismatch between needs and provision highlights the urgency of climate-responsive OSH measures.

Expected Supports from Brands

Workers and factory management alike emphasized the the responsibility of brands in safeguarding worker welfare during climate transitions. Quantitatively, 65.5% expected medical support and health insurance, 50% hazard pay or wage increases, and 48% safety training and protective gear. Fewer workers (34%) highlighted investment in cleaner technologies. A mid-level manager explained, *"They (buyers) can help us adopt various types of new technologies and maintain compliance. Also, they can provide financial assistance"* (Management, KII). Another informant added, *"Sustainability efforts are mostly buyer-driven. Without that external pressure or support, many factories wouldn't invest in these upgrades voluntarily"* (CSO, KII). These insights indicate that brands are viewed not only as compliance enforcers but also as critical enablers of health, safety, and technological transformation.

Prioritized Areas to Protect Workers for Suppliers

From the suppliers' perspective, job security was the most critical protection 83.3%, followed by fair wages 62.7%, skill development and retraining 64%, and improved workplace safety 35.8%. Qualitative data reinforced this, with one trade union representative noting, *"If we can provide support or raise awareness, for example through different types of technical training, we could help them shift into other professions."* At the same time, workplace conditions remain a pressing issue, as one worker described *"The heat is unbearable in the factory. Ironing generates the most heat… the heat from the upper floor's roof makes it worse"* (Workers, FGD). Together, these findings highlight suppliers' dual responsibility to secure jobs while upgrading workplace safety conditions.

Support Needed for Fair Transition

Quantitative results show that skill development and reskilling programs (87.8%) are workers' most urgent need, followed by government financial aid (53.3%), job replacement in green industries (44.8%), and stronger labour rights (48%). Workers fear displacement from automation and climate-induced disruptions. One worker asked, *"Where previously 10 workers were needed, now only two are enough. So, what happens to these eight workers?"* Echoing this, a MoLE representative emphasized, *"For workers who cannot continue with their current jobs due to the technological shift, alternative training and employment opportunities should be arranged."* Both perspectives underscore that reskilling and policy-backed social protection are central to ensuring no worker is left behind.

Workers' Interest in New Skill Development

There is overwhelming interest in skill development, with 87.2% of workers supporting training for sustainable and green jobs and 79.5% interested in entrepreneurship and alternative skills. Others expressed interest in energy-efficient technologies (31.3%) and safe chemical handling (19.2%). Workers themselves voiced readiness for adaptation: *"When the new machines come, we will have no jobs. But we're willing to learn about new machinery."* Another female worker stressed, *"Because of new technology, workers are laid off. When they (the company) lay off workers, do they take any initiative to provide skill-building?"* (Worker, FGD). Institutions such as NSDA are attempting to respond: *"Recently, we've started to design our training modules especially focusing on reduce, reuse, recycling, and green concepts."* However, capacity gaps persist, indicating that worker demand far exceeds current supply.

Responsible Bodies for Ensuring a Fair Transition

Responsibility for fair transition is widely seen as a shared duty. Workers placed the most responsibility on employers (75%) and the government (59.3%), while also recognizing the roles of brands (58.5%), trade unions (18.5%), and NGOs (10%). One trade union representative argued, *"The government should ensure alternative employment for the other workers who lose their jobs. Those who lose their jobs in one sector can shift to other kinds of work."* Yet, worker representation remains weak; only 7.5% reported being union members, and just 10% believed unions play a strong role in climate-related issues. As one worker put it, *"They (trade unions) exist, but they speak from the owners' side, not from ours."* This gap underscores the need to strengthen worker organizations to ensure fair and inclusive transitions.

The combined quantitative and qualitative findings converge on a clear message RMG workers are highly aware of climate risks, deeply concerned about job security, wages, and health, and overwhelmingly eager to acquire new skills to adapt to the future. At the same time, structural weaknesses, limited social protection, weak OSH enforcement, insufficient brand accountability, and underpowered trade unions undermine their resilience. A fair transition in the RMG sector will therefore require multi-stakeholder responsibility, with employers and government at the center, brands providing financial and technological support, and unions/CSOs strengthening worker voice.

4.9.2 Insights from Leather Sector

Top Worker Priorities for a Fair Transition

Leather workers expressed clear priorities for a fair transition, with higher wages (72%), a safer workplace (67.3%), and health insurance (61.3%) topping the list. Workers also emphasized the importance of training on climate adaptation (42%) to prepare for future risks. Qualitative accounts strongly reinforced these concerns. As one worker put it, *"To increase workers' capacity, we should provide them with professional development training and ensure that their basic social needs and social security are met."* This shows that fair compensation, job protection, and training opportunities form the foundation of workers' expectations.

Health & Safety Priorities

Health and safety emerged as urgent adaptation needs. Cooling systems (70.7%), improved ventilation (56%), and safe drinking water (41.3%) were among the most cited requirements. Access to protective gear (39.3%) and medical assistance/health insurance (67.3%) were also prioritized. Qualitative findings validate these numbers, *"The heat and intense temperature add a burden to our mental health. Stress builds up, and it affects our productivity too; All of them (Government bodies and Industry owners) were promised a clinic and an ambulance service, but none of them have been implemented."* (Worker, FGD). The findings reveal that while occupational safety is acknowledged, investments in climate-related health risks remain insufficient.

Expected Supports from Brands

Workers held brands accountable for playing a proactive role in the transition. Medical assistance and health insurance (69.3%), safety training (53.3%), and compensation for health impacts (49.3%) were top expectations, alongside investments in eco-friendly technologies (41.3%) and risk allowances (44.7%). Yet, three-quarters of workers (75.4%) reported receiving no support from brands, exposing a major gap between expectations and reality. As one participant highlighted, *"The leather owners take all the money from the buyers, but the workers don't receive any incentives"* (Trade Union, KII). This illustrates workers' frustration at the uneven distribution of benefits along the value chain.

Prioritized Areas for Suppliers

From suppliers, workers prioritized job security (72.7%), fair wages and financial support (60.7%), and skill development/re-skilling (78%). Other priorities included new job opportunities in sustainable industries (45.3%) and better working conditions (35.3%). The fear of job loss due to automation was a recurring concern: *"If automation comes, the workers will lose their jobs. It's already happening to some extent."* Yet, others argued that automation could increase technical jobs if workers were retrained: *"If the younger generation learns how to operate a machine, they could work in another factory too."* This highlights both risks and opportunities, contingent on supplier investment in skills.

Support Needed for a Fair Transition

The most pressing need identified was skill development and re-skilling (84.7%), followed by government financial aid (58.7%), job replacement in eco-friendly sectors (46.7%), and strengthened worker rights (50%). Both survey and qualitative data emphasized that training must go hand-in-hand with social protection. As a leather manager observed, *"If a worker loses their job, they get mentally distressed immediately. If the government takes the initiative with an incentive scheme, it would give workers a sense of security."* This underscores the importance of integrating psychosocial and economic protection into just transition planning.

Workers' Interest in New Skills

Workers expressed strong interest in entrepreneurship and alternative employment (61.3%), safe chemical use and waste management (51.1%), and energy-efficient technologies (39.4%). Qualitative evidence confirmed this enthusiasm: *"If we receive training, we'll adapt. We're not against modern machines we just want to be part of it." Employers also recognized this readiness, with one manager noting, "Yes, workers would be interested but proper training is essential."* This suggests that while the workforce is open to green skills, institutional pathways remain underdeveloped.

Responsible Bodies for Ensuring a Fair Transition

Workers overwhelmingly placed responsibility on employers (75.3%) and the government (58.7%), followed by workers themselves (32.7%), trade unions (27.3%), NGOs (24.7%), and brands/buyers (24%). Yet, confidence in trade unions was low: only 11.3% believed they were *effectively addressing climate challenges, while 37.3% said unions were failing, and over half (51.4%) were unsure. One worker commented, "They (Trade Union) talk a lot, make announcements but can't even ensure the minimum wage."* Others highlighted the lack of coverage: *"143 tanneries were supposed to be under trade unions, but they couldn't bring them all in."* This reflects a significant representation gap in a sector where 87.3% of workers are not unionized.

The analysis reveals that tannery workers are highly aware of their vulnerabilities and willing to adapt, but their readiness is undermined by structural barriers, weak health systems, wage insecurity, lack of training, and minimal brand accountability. Quantitative data highlights a strong consensus on the need for skill development, fair wages, and safety measures, while qualitative insights show the emotional and financial toll of job insecurity, the frustration at brands' inaction, and the unrealized potential of trade unions. Workers themselves remain open to change, with many expressing eagerness to acquire green skills and entrepreneurial capacity. However, without coordinated support from employers, government, brands, and unions, the promise of a just transition risks leaving leather workers behind.

4.9.3 Insights from Leathergoods and Footwear Sector

Top Worker Priorities for Fair Transition

Workers in the footwear and leathergoods sector articulated clear priorities for a fair transition, centering on economic stability and security. Quantitative findings show that 95.2% prioritized fair wages, 90.5% alternative job training, 76.2% reskilling, and 66.7% both health insurance and government assistance. Job security was highlighted by 57.1%, while 52.4% emphasized safe workplaces. This reflects deep concerns about vulnerability to job loss, low wages, and lack of social protection. As one worker explained during survey, *"The real obstacle will come for us. The owners won't have any trouble. If the government doesn't step in, workers will be left behind."* The data underscores that for most workers, a fair transition means one that safeguards wages, ensures security, and equips them with alternative livelihood options.

Health & Safety Priorities

Climate-induced risks to health and safety were reported as urgent. All surveyed workers 100% demanded improved ventilation and cooling systems, while 90.5% emphasized

longer breaks during extreme heat. A strong majority also wanted regular health check-ups and medical support 85.7%, health insurance coverage 90.5%, and hydration stations 66.7%. Protective gear 42.9% and emergency health response plans 47.6% were less frequently cited but remain critical. Some also noted mental health stress due to rising climate pressures 38.1%. A worker described factory conditions: *"With the heat from the machines and the roof above us, the workplace becomes unbearable. We cannot work properly and often fall sick."* These findings highlight how climate change directly affects occupational safety, reinforcing the demand for comprehensive OSH systems integrated with climate resilience.

Expected Supports from Brands

Workers expressed strong expectations that brands should play an active role in supporting adaptation. Quantitative results show demands for medical assistance and insurance 60.9%, skill development and reskilling 65.3%, better working conditions 54.7%, and financial support 57.3%. However, awareness of brands' responsibilities remains low 70% of workers were unsure whether brands should be accountable for pollution or worker welfare. This gap suggests a need for both brand transparency and worker sensitization. Nevertheless, workers clearly expect buyers to share responsibility, especially in ensuring training and health protections.

Prioritized Areas to Protect Workers for Suppliers

Employers were identified as having the most immediate responsibility for protecting workers. Workers emphasized fair wages and financial support (100%), job security (95.2%), and skill development and reskilling (95.2%) as top priorities. Other key areas included new job creation in sustainable industries (61.9%) and improving workplace safety (61.9%). These findings align with survey responses that 90.7% of workers see employers as primarily responsible for ensuring a just transition, far higher than government or brands. This highlights workers' readiness, but also their reliance on employers to initiate and finance these opportunities.

Support Needed for a Fair Transition

The most urgent support identified was skill development and retraining (92.7%), followed by financial aid during job transitions (66%), stronger labour protections (50.7%), job placement in climate-friendly industries (44%), and better health and safety provisions (35.3%). Yet, despite this overwhelming demand, 84.8% of workers reported being unwilling to reskill primarily due to economic stress, lack of awareness, or limited access to learning platforms. This highlights both the aspiration for new opportunities and the barriers preventing workers from seizing them. It suggests that without targeted awareness programs, stipends, and accessible training, reskilling programs risk remaining underutilized.

Workers' Interest in New Skill Development

Despite barriers, workers expressed clear areas of interest for green skills. 59.3% wanted training in entrepreneurship and alternative livelihoods, 40% in energy-efficient technologies, and 25.5% in safe chemical use and waste management. These aspirations reflect both the economic drive for independence and a recognition of the importance of sustainable practices in future work. As one worker noted, "When the new machines come, we will have no jobs. But we're willing to learn about new machinery." This willingness underscores the sector's adaptive potential, provided systemic support is in place.

Responsible Bodies for Ensuring a Fair Transition

When asked who should lead a fair transition, workers overwhelmingly placed responsibility on employers (90.7%), followed by the government (50.7%), brands (26.7%), and trade unions (14.7%). Only 1.4% saw workers themselves as responsible, signalling limited empowerment or agency in decision-making. The low confidence in unions mirrors qualitative findings where participants expressed distrust, stating unions often do not act independently of owners. This reveals a structural weakness in collective worker voice, underscoring the importance of strengthening social dialogue mechanisms and empowering unions to represent climate-related concerns more effectively.

Taken together, the data paints a picture of a sector highly vulnerable to climate and economic shocks, yet cautiously hopeful about opportunities for adaptation. Workers are clear about their needs for example, fair wages, job security, health protections, and skill development but face structural barriers like weak labour law enforcement, lack of alternative jobs, and low trust in institutions. While employers are seen as the primary actors, brands, government, and unions all have critical roles to play in building a fair and inclusive transition. The findings also reveal paradox workers overwhelmingly want new opportunities but are reluctant to reskill under current conditions, pointing to the need for integrated packages of

training, financial support, and awareness-building. Ensuring a just transition in the footwear and leathergoods sector will therefore depend on multi-stakeholder collaboration, systemic investment, and strengthened worker voice.

4.10 Challenges in the Just Transition Pathways

The findings indicate that just transition pathways in Bangladesh's RMG, leather, and footwear sectors are shaped by overlapping socio-economic vulnerabilities, institutional weaknesses, and governance gaps, though with sector-specific variations. In the RMG sector, workers mainly contend with financial insecurity and limited awareness, coupled with weak institutional support and moderate training gaps; however, the structural barriers are relatively fewer compared to other sectors. In contrast, the leather sector faces the most systemic obstacles, including limited job alternatives, widespread skills deficits, financial instability, weak labour law enforcement, inadequate policy frameworks, and strong employer resistance, making it the least prepared for a just transition. Meanwhile, the footwear sector is particularly burdened by employment and skills-related vulnerabilities, with workers expressing fears of job loss, wage cuts, and insufficient training. Workers demand, "We want such policies, and we want our opinions to be taken seriously. We're the ones being left behind" (Worker, FGD).Unlike RMG and leather, barriers in the footwear industry are less policy-driven and more rooted in economic fragility and gaps in preparedness for transition.

Despite widespread acknowledgment of the need for climate resilience and sustainable industrial transformation, the transition to green jobs in the RMG, Leather, Leathergoods and Footwear sectors remains severely constrained. The barriers are not primarily technological but structural and political, reflecting entrenched power asymmetries and weak institutional accountability. Workers themselves clearly identify their needs reskilling opportunities, income security, and legal protection yet the state remains passive, employers are resistant, brands largely silent, and unions too weak to exert meaningful influence. This governance vacuum is creating a widening gap between the urgency of climate adaptation and the lived realities of vulnerable workers.
National-Level Barriers

At the national level, the top barriers to green job transition include lack of alternative job opportunities 64.3%, low wages and financial insecurity 49.3%, lack of skills and training for green jobs 47.5%, poor enforcement of labour laws 43.6%, and inadequate government or employer support 37%. Additional constraints include limited awareness of climate risks 37.8%, owner unwillingness to invest in adaptation measures 32.2%, and the absence of coherent policies or guidelines 11.4%. Together, these factors highlight how weak social protection systems and governance failures intersect with economic precarity to deepen workers' vulnerability in the face of climate change.

Cross-Sectoral Trends

- Lack of alternative job opportunities emerges as the most significant barrier across all sectors: RMG (62.5%), Leather (65.3%), and Footwear (68%). This underscores structural limitations in Bangladesh's labour market, where workers lack pathways to shift into green or sustainable jobs.
- Low wages and financial insecurity are a major challenge in all sectors, highest in Leather (57.3%) and Footwear (54%), slightly lower in RMG (44.5%). This indicates that economic precarity prevents workers from embracing transition risks.
- Weak enforcement of labour laws and owner unwillingness are persistent governance barriers across all sectors, revealing systemic institutional gaps and employer resistance to transformation.
- Skills and training deficits for green jobs are widespread: Leather (61.3%), Footwear (53.3%), and RMG (32.3%). This suggests workers remain unprepared for green industrial shifts, especially in sectors requiring technical knowledge (Leather, Footwear).
- Limited government support for climate adaptation is a barrier in all sectors, highest in Leather (49.3%), moderate in RMG (39.3%), and lowest in Footwear (27.2%).

Sector-Specific Barriers

In RMG Sector, barriers are dominated by lack of alternative jobs (62.5%) and awareness gaps (44.8%). Compared to Leather and Footwear, RMG workers show lower skills/training deficits (32.3%), likely because of higher exposure to training programs through global supply chain pressures. However, weak labour law enforcement (40.5%) and owner resistance (36.5%) remains critical bottlenecks.

In the Leather Sector, this sector shows the highest structural and institutional barriers: weak law enforcement (52%), owner unwillingness (52.7%), skills gap (61.3%), and wage insecurity (57.3%). Workers here are doubly burdened by chemical-intensive processes and poor regulation, making Just Transition especially difficult.
In the Footwear Sector, while lack of alternative jobs (68%) is most acute here, Footwear workers also face substantial financial insecurity (54%) and skills/training gaps (53.3%). Awareness of climate risk is comparatively lower (40.5%), and government support (27.2%) is perceived as weakest. Interestingly, employer unwillingness (34.3%) is somewhat lower than in Leather, suggesting scope for engagement.

Structural and Political Dimensions

Ultimately, the evidence underscores that the barriers to green jobs are not technical obstacles but governance failures. The absence of strong policy frameworks, weak enforcement of labour laws, limited financial commitments, and lack of institutional accountability hinder collective preparedness for a just transition. Workers' persistent exclusion from decision-making processes further deepens this crisis. Without decisive action by the state, employers, and global brands, the current trajectory risks exacerbating inequality, leaving the most vulnerable workers particularly in the Leather and Footwear sectors without pathways to adaptation or sustainable livelihoods. RMG and leather sectors face structural barriers such as ow awareness, lack of policies, and resistance from employers, while footwear sector barriers are primarily socio-economic, with workers fearing job loss and lacking financial resilience. An FGD participant emphasized "The government needs to step in. Owners can't set up clinics or training by themselves. Without joint action, this transition won't include us."Among all, leather workers encounter the most policy and governance-related challenges, whereas footwear workers suffer from a lack of preparedness and social protection mechanisms.

Implications

- **Labour Market Vulnerability:** With 60–70% of workers in each sector citing lack of alternative jobs, Bangladesh risks widespread unemployment or underemployment in the absence of planned Just Transition pathways.
- **Sectoral Disparities:** Leather is most constrained by governance and employer resistance, Footwear by job scarcity and training deficits, and RMG by financial insecurity and weak labour protections.
- **Policy Gap:** The consistently low confidence in government support (27–49%) reflects a major policy credibility challenge, requiring stronger institutional frameworks and investment in worker-centered climate adaptation.
- **Skills and Training:** The Leather and Footwear sectors urgently need structured reskilling programs to prepare workers for green transitions, while RMG needs deeper integration of climate risk awareness and labour protections.

Table 22: Challenges in Just Transition Pathways

Dimensions	RMG Sector	Leather Sector	Footwear Sector
Barriers to transitioning to green jobs	Lack of awareness about climate risk (44.8%); Lack of alternative job opportunities (62.50%), Insufficient funds for climate-friendly infrastructure (25.5%); Lack of support from government for climate adaptation (39.3%); Weak enforcement of labour laws (40.50%), Owner unwillingness (36.5%); Lack of skills & training for green job (32.30%), Low wages & financial insecurity (44.50%)	Lack of awareness about climate risk (56.7%); Lack of alternative job opportunities (65.30%), Lack of funds for eco-friendly infrastructure (28%); Lack of support from government for climate adaptation (49.30%); Weak enforcement of labour laws (52.00%), Owner unwillingness (52.7%); Lack of skills and training for green jobs (61.30%), Low wages and financial uncertainty (57.30%)	Lack of awareness about climate risk (40.5%); Lack of alternative job opportunities (68%), Lack of funds for eco-friendly infrastructure (29.3%); Lack of support from government for climate adaptation (27.20%); Weak enforcement of labour laws (43.30%), Owner unwillingness (34.3%); Lack of skills and training for green jobs (53.30%), Low wages and financial insecurity (54%)

Chapter 5 Key Recommendations

Policy Recommendations

To address climate vulnerability, industry readiness, and just transition for RMG, leather, leathergoods, and footwear sectors, recommendations include investing in energy efficiency and renewable energy, developing circular economy models through waste management and recycling, implementing worker skills training for green jobs, strengthening social dialogue for fair policies, improving data collection and transparency on climate impacts, and establishing green funds for sector-specific investments. All sectors should also advocate for supportive policies, foster collaboration between stakeholders, and ensure workers' voices are integrated into decision-making processes.

Government

- Strengthen labour inspections and monitoring in industrial clusters to ensure compliance with labour rights, occupational safety, and social protection.
- Develop and implement alternative employment and livelihood programs for workers displaced by automation or climate-induced disruptions.
- Design fair transition strategies, including reskilling, financial support, and job placement services for workers entering green jobs.
- Provide financial incentives (green funds, tax breaks, subsidies) to promote renewable energy adoption, energy-efficient upgrades, and climate-resilient infrastructure.
- Introduce climate-responsive leave policies, including mandatory rest breaks during extreme heat and emergency leave during floods or cyclones.
- Develop integrated, gender-responsive climate adaptation and Just Transition policies, safeguarding youth and women workers.
- Prepare a sectoral climate transition roadmap for RMG, leather, leathergoods, and footwear, with clear targets and accountability mechanisms.
- Establish universal health insurance covering climate- and occupational-related risks, including heat stress, chemical exposure, reproductive health, and mental health.
- Map climate vulnerability at the worker level across major industrial clusters, including informal sectors, communities, and supply chains.

Employers / Employer Associations

- Establish worker-led climate safety committees with authority and resources to monitor heat stress, chemical risks, and workplace safety.
- Invest in climate-resilient infrastructure, including ventilation, cooling, flood protection, energy efficiency, and low-emission technologies.
- Promote sustainable practices such as renewable energy, circular economy models, cleaner production, and Zero Liquid Discharge (ZLD) systems.
- Integrate climate adaptation and Just Transition into core business operations and sustainability reporting, aligning with HREDD, EU CSDDD, GSP+, and LDC graduation requirements.
- Collaborate with international buyers/brands to co-invest in sustainable production, worker health, reskilling initiatives, and ensure fair purchasing practices.

International Buyers / Brands

- Ensure ethical sourcing and responsible purchasing practices that enable suppliers to provide living wages and social protection.
- Provide financial and technical support for suppliers to adopt climate-resilient and green production systems.
- Invest in workforce reskilling, green technology adoption, and Just Transition funds, with transparent reporting on outcomes (e.g., % insured, % trained, % represented in safety committees).

- Support a climate risk insurance pool through multi-stakeholder mechanisms, guaranteeing workers' wages during climate-induced factory shutdowns.
- Promote global regulatory compliance (HREDD, EU CSDDD, UK Modern Slavery Act, EU Forced Labour Regulation) to ensure supply chain transparency and labour rights protection.

Trade Unions

- Expand presence in both formal and informal sectors; strengthen capacity in climate literacy, occupational health, labour rights, and emerging global frameworks (HREDD, Just Transition, Forced Labour, Modern Slavery).
- Advocate for Just Transition policies to protect climate-vulnerable workers at government, brand, and supplier levels.
- Lead tripartite dialogues with government and employers on reskilling, social protection, and occupational safety.
- Raise awareness on climate-related health risks (heat stress, fatigue, sickness, heatstroke).
- Negotiate for climate-resilient workplaces, job security, reskilling, and stronger OSH measures through structured social dialogue.
- Advocate for climate vulnerability mapping and the development of national transition roadmaps.
- Push for stronger social safety nets, including pensions, sick leave, maternity benefits, injury compensation, and healthcare.

Civil Society Organizations (CSOs)

- Conduct awareness campaigns on workers' rights, climate risks, and Just Transition, enabling informed worker participation.
- Provide legal aid and support services to workers facing rights violations, workplace injury, or unfair dismissal.
- Facilitate multi-stakeholder dialogue platforms to shape inclusive and evidence-based policy development.
- Monitor and publish independent assessments of labour conditions, OSH compliance, and climate impacts.
- Advocate for gender-responsive adaptation measures, focusing on women workers' health, safety, and skill development.
- Pilot and scale community-based climate resilience programs, including mobile health clinics, green cooperatives, and vocational training.

Chapter 6 Conclusion

Bangladesh's RMG, Leather, Leathergoods and Footwear sectors are pivotal to national economic growth, employment, and export performance. This study underscores that while these sectors are critical engines of development, they are increasingly exposed to climate-induced vulnerabilities ranging from extreme heat, flooding, and cyclones to chemical hazards and environmental pollution. Workers, particularly women and internal migrants, face compounded risks to health, livelihoods, and social well-being. Climate-induced migration, precarious housing, insufficient sanitation, and inadequate social protection amplify both physical and socio-economic vulnerabilities, highlighting the urgent need for sector-wide adaptation and equitable policies.

The evidence demonstrates that climate change is already disrupting productivity, occupational health, and worker incomes, with varying impacts across sectors. RMG workers contend primarily with heat stress and high workload; Leather workers face chemical hazards and weak social protection; Footwear workers experience economic fragility and limited access to adaptation measures. Across all sectors, knowledge of climate risks and the concept of a Just Transition remain limited, though workers and unions recognize its potential as a framework for safer jobs, fair wages, and skill development.

Industry readiness is uneven. While large export-oriented factories are adopting renewable energy, circular economy practices, and international certifications, smaller and informal enterprises remain poorly prepared, with weak compliance, insufficient climate adaptation, and minimal social protection. Governance gaps, fragmented responsibilities, and resistance to change further hinder a coordinated transition. The study highlights that without systemic policy support, equitable financing, and multi-stakeholder collaboration, the transition risks deepening inequalities and leaving the most vulnerable workers behind.

A Just Transition framework emerges as both necessary and feasible. Embedding climate resilience into industrial operations, expanding social protection, facilitating green skills development, and enhancing worker participation are essential to safeguarding livelihoods while maintaining industrial competitiveness. Multi-stakeholder engagement-including government, employers, trade unions, civil society, and international brands-offers a pathway to harmonize environmental sustainability with social justice. Integrating these measures into sectoral strategies can mitigate climate risks, protect worker health, and strengthen the global competitiveness of Bangladesh's RMG, Leather, Leathergoods and Footwear industries.

In closing, the study affirms that climate change is not only an environmental challenge but also a socio-economic and labour rights issue. Advancing a worker-centered Just Transition requires coordinated policies, innovative financing, institutional strengthening, and inclusive governance. By prioritizing resilience, equity, and skills development, Bangladesh's RMG, Leather, Leathergoods and Footwear sectors can transform vulnerability into opportunity, ensuring sustainable industrial growth, empowered workers, and long-term climate adaptation.

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Annexe Case Stories

Heat, Pressure, and Hope: A Case Study of Rina in Dhaka's Garment Industry

Background

Rina migrated from Patuakhali, a coastal district in southern Bangladesh, to Dhaka at the age of 15 in search of employment. As the youngest of three sisters, her migration was driven by severe household poverty, an ageing father, and the absence of male earners in the family. In 2007, she secured a position in the sewing section of a garment factory through the support of relatives already employed in the sector.

Adjustment to Factory Work

Transitioning from rural life to industrial labour presented significant challenges. Initially unfamiliar with production processes and performance targets, Rina faced difficulties in meeting factory demands. Over time, she acquired the necessary skills and adapted to the pace of the industry, demonstrating resilience in navigating new socio-economic and occupational realities.

Occupational Health and Climate Stressors

Rina's experience highlights the intersection of occupational health risks and climate-induced stressors in the garment sector. Prolonged working hours, high production quotas, and limited access to rest breaks have contributed to physical and mental exhaustion. Seasonal temperature rises exacerbate these conditions, particularly in factories lacking adequate ventilation and cooling systems.

During the summer months, workers frequently report heat stress symptoms, including fatigue, dehydration, and fainting episodes. Insufficient water intake and limited nutritional support further heighten vulnerability, especially among women. Rina's case reflects a broader trend in which climate change amplifies occupational health hazards for garment workers in Bangladesh.

Economic Pressures and Automation

The wage increase introduced in 2024, although intended to improve livelihoods, has paradoxically intensified production demands. Employers have responded to higher labour costs by raising output targets, thereby offsetting the potential benefits of wage adjustments.

Simultaneously, the gradual integration of automation has reshaped workplace dynamics. While technological adoption enhances efficiency, it also reduces workforce numbers and redistributes workloads, resulting in greater pressure on remaining operators. For workers like Rina, automation generates dual anxieties: increased workloads and heightened job insecurity.

Resilience and Aspirations for Change

Despite enduring multiple layers of vulnerability, Rina remains resilient and continues to aspire to improved labour conditions. Her experience underscores the urgent need for institutional interventions, including access to training, occupational health services, adequate hydration and rest facilities, and policy measures that balance productivity with worker well-being.

Implications

Rina's case illustrates the compounded pressures of poverty-driven migration, occupational health hazards, climate stress, wage policy shifts, and automation in Bangladesh's garment industry. The narrative demonstrates how structural and environmental factors intersect to shape the lived realities of female workers. It further highlights the necessity for coordinated action by government, employers, and stakeholders to ensure that industrial growth does not compromise worker health, dignity, and security.

Working in a Furnace: A Case Study of Sahid in Dhaka's Garment Sector

Background

Sahid (pseudonym), originally from Barguna District, migrated to Dhaka in 2007 due to economic necessity and family responsibilities. Growing up as one of six siblings in a low-income household, he sought employment in the garment sector as a pathway to financial stability and future security. He began his career as a packer, later transitioning to helper and operator roles across various factories in Dhaka and Export Processing Zones (EPZs). Over a 17-year career, Sahid advanced in responsibility and experience but also faced persistent occupational and environmental challenges.

Occupational Conditions and Climate Stress

Sahid's case illustrates the intensifying effects of climate change on factory work. Factories, particularly during the summer months, often become unbearably hot due to inadequate ventilation and proximity to machinery such as boilers. Workers report indoor conditions resembling 40–47°C, far above ambient outdoor temperatures. Prolonged exposure to such heat leads to dizziness, dehydration, fainting, fever, and muscular strain.

Although some coping mechanisms are provided by employers, such as access to saline, lemon, or sugarcane syrup, these measures are largely inadequate. Workers lack structured training on heat stress management or climate change adaptation, leaving them vulnerable to recurring health risks.

Production Pressures and Worker Strain

Alongside heat stress, Sahid's experience underscores the relentless production demands in the industry. Workers are expected to produce up to 200 pieces per hour. Mechanical breakdowns or other delays are not considered legitimate causes for reduced output, and workers must compensate for lost time, which intensifies both mental and physical strain.

Breaks are limited, and workers often forgo hydration or restroom use to keep pace with production targets. This results in chronic fatigue, compounded by the dual burden of occupational stress and climate related health impacts.

Technological Change and Work Intensification

The introduction of high-speed automated machines has transformed production dynamics. While automation has not led to widespread job losses in Sahid's experience, it has reduced workforce numbers and increased workloads for those remaining. Work is now more concentrated, less interactive, and more demanding, leading to heightened strain among operators. The shift illustrates how technological adaptation, while enhancing efficiency, contributes to labour intensification rather than alleviation.

Resilience and Prospects for Improvement

Despite enduring persistent health risks, production pressure, and occupational insecurity, Sahid maintains a hopeful outlook. He emphasizes the need for improved health and safety measures, systematic training on climate change adaptation, and more supportive workplace environments. He identifies rest, hydration, and realistic production expectations as essential for sustaining worker health and productivity in the face of intensifying climate and technological pressures.

Implications

Sahid's case reflects the convergence of climate change, occupational health risks, and technological transition in Bangladesh's garment industry. It demonstrates how inadequate workplace adaptation mechanisms exacerbate vulnerability, leaving workers to absorb the costs of environmental stress and industrial modernization. The case highlights the urgent need for institutional reforms, including strengthened occupational safety standards, climate-responsive workplace design, and equitable labour management practices, to ensure that industrial efficiency does not come at the expense of worker well-being.

Between Heat, Chemicals, and Uncertainty: A Case Study of Rafiq in Bangladesh's Leather Sector

Background

Rafiq, a 28-year-old worker originally from Noakhali, has spent more than five years in the leather sector. His educational attainment ended at Class 8, and limited employment opportunities left him dependent on his family and experiencing a period of depression. Seeking independence, he migrated first to Narsingdi in 2014, where he briefly operated a roadside tea stall, before moving to Dhaka in search of more stable work. Through a local contact, he secured employment in the leather industry, where he has remained since.

Work Environment and Occupational Exposure

Rafiq began his career in the Wet Blue processing department, a section of the leather supply chain that involves extensive handling of raw hides and hazardous chemicals. This work is physically demanding and requires long hours—often up to 12 hours a day, six days a week. Despite the intensity of the labour, his income remains barely sufficient to cover basic food and living expenses, leaving little room for financial security or upward mobility.

Climate Stress and Chemical Hazards

The intersection of extreme heat and occupational chemical exposure has had a significant impact on Rafiq's health. Handling salt-coated raw skins frequently leads to skin rashes and allergic reactions, which are exacerbated by excessive sweating during hot weather. Workers such as Rafiq attempt to mitigate these conditions through frequent hydration and bathing; however, these coping strategies are insufficient to prevent chronic skin irritations and overall exhaustion.

This case demonstrates how climate change compounds occupational health hazards in the leather sector, as rising temperatures intensify the physical and chemical stresses inherent to leather processing.

Technological Change and Job Insecurity

Like many workers in the industry, Rafiq is acutely aware of the gradual introduction of automation. While he believes that some labour-intensive processes in Wet Blue processing cannot easily be replaced, he also recognizes that automation reduces the number of workers required in other sections of production. This trend raises concerns about long-term job security, especially for low-skilled workers.

Physical Strain and Future Aspirations

After more than half a decade of physically intensive work, Rafiq reports significant physical exhaustion and doubts his ability to continue in such roles long term. He is considering alternative livelihoods, such as returning to shopkeeping or migrating abroad in search of better opportunities. This reflects both the physical toll of leather work and the limited prospects for advancement within the sector.

Implications and Resilience

Rafiq's experience illustrates the vulnerabilities of workers in Bangladesh's leather industry at the intersection of climate change, occupational hazards, and technological transformation. His case underscores the urgent need for worker-centered solutions, including improved occupational health measures, protective equipment, training on climate adaptation, and social protection systems that provide alternatives for those unable to sustain physically intensive labour.

Despite the challenges, Rafiq demonstrates resilience and cautious optimism, continuing to hope for systemic changes that can better support workers in navigating the combined pressures of environmental stress and industrial modernization.

Between Machines and Uncertainty: A Case Study of Arman in Bangladesh's Leather Sector

Background

Arman, originally from Barisal, migrated to Dhaka at the age of 17 in pursuit of better employment opportunities. After briefly working in Keraniganj as a ladies' designer operator a role he found unsuitable—he entered the leather sector in Hemayetpur in 2018. With no prior experience, he learned on the job under the guidance of senior workers, eventually becoming a machine operator handling equipment such as the fleshing machine and hydraulic pressure vacuum machine. His trajectory reflects the pathway of many rural youths who transition into industrial labour with limited formal training.

Occupational Environment and Health Risks

The leather industry has exposed Arman to significant occupational hazards. Prolonged exposure to chemicals, pollutants, and heat has had negative effects on his physical health and emotional well-being. Workers commonly report difficulties in maintaining healthy weight, fatigue, and respiratory discomfort, all of which are exacerbated by the absence of adequate occupational health safeguards.

Summer conditions are particularly severe. With outdoor temperatures exceeding 35°C, indoor conditions become stifling. Factories lack systematic heat management measures, relying only on basic provisions such as bottled filtered water carried into work areas. This limited adaptation demonstrates the gap between occupational risks and institutional responses in smaller leather factories.

Automation and Job Security Concerns

Arman's case illustrates the tension between technological advancement and labour insecurity. Tasks that once required multiple workers are increasingly performed by machines, reducing the demand for manual labour. While Arman has invested years in developing operational skills,

Institutional Weaknesses and Worker Representation

Another dimension of vulnerability arises from weak institutional mechanisms in smaller factories. Unlike larger tanneries, where unions may be present, smaller establishments often lack collective bargaining structures. Workers in these settings face irregular wage disbursement, limited labour rights protections, and no formal channels for voicing grievances. This creates precarious working conditions in which employees have minimal control over pay schedules, benefits, or workplace reforms.

Resilience Amid Uncertainty

Despite the health risks, heat stress, and uncertainty regarding technological change, Arman continues his work with persistence and precision. His case highlights the resilience of young workers who navigate industrial environments under difficult circumstances while carrying concerns about both present risks and future insecurities.
Implications

Arman's experience reflects broader challenges in Bangladesh's leather sector, where youth migration intersects with occupational hazards, climate stress, weak institutional protections, and the disruptive effects of automation. His case demonstrates the urgent need for policy interventions that include worker training, stronger occupational health measures, formalized worker representation, and strategies for managing technological transitions without displacing vulnerable labour.

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