

# Assessing Exposure and Vulnerabilities of RMG Workers to Climate Change and Environmental Causes



**Bangladesh Institute of Labour Studies-BILS**

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**April 2024**



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## **ABSTRACT**

This research is an attempt to identify and analyse the climate change and environmental issues, concerns and vulnerabilities of garment workers of Bangladesh, in their living place and inside RMG factories. Relevantly, this research looks at climate change and environmental grievance mechanisms in the community and inside factories and the preparedness of the trade unions to address RMG workers' vulnerabilities to climate change and environmental causes. Both quantitative and qualitative research approaches and respective tools and techniques are equally applied. Survey method is particularly emphasized backed by FGD, consultation, interview, and literature review methods. Research findings show that excessive heat and hotness, climate and environmental migration, serious inefficiency in energy, water, and chemical usage, massive water, air and sound pollution and poor waste management practices are consistently prevalent both at RMG workers living places and inside factories. These are causing serious health vulnerabilities to workers. Leave/absence, income and capacity loss and productivity loss are too frequently reported for these. Grievance mechanisms to climate change and environmental causes are ineffective and adaptation initiatives are inadequate to zero. There is a serious gap in the level of skills, capacity and awareness among workers and trade unions and as such effective social dialogue is completely missing. Amidst of all these, factories are increasingly getting transformed to green factories with little to no participation of either workers or trade unions in the transformation processes.

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## Acronyms

BGMEA	Bangladesh Garment Manufacturers and Exporters Association
BILS	Bangladeshi Institute of Labour Studies – BILS
BSCIC	Bangladesh Small and Cottage Industries Corporation
CC	Climate Change
CO <sub>2</sub>	Carbon Dioxide
CRED	Climate-Related Disasters
CSO	Civil Society Organization
DIFE	Department of Inspection for Factories and Establishments
DoE	Department of Environment
DoL	Department of Labour
DRR	Disaster Risk Reduction
ED	Executive Director
EMF	Ellen Macarthur Foundation
ETP	Effluent Treatment Plant
FGD	Focus Group Discussion
GIZ	The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
Govt	Government
HSC	Higher Secondary Certificate
ILO	International Labour Organization
IRP	Incident Response Plan
JHUTE	Waste clothes from RMG factories
JICA	Japan International Cooperation Agency
LED	Light-Emitting Diode
LEED	Leadership in Energy and Environmental Design
MoE	Ministry of Environment
NGO	Non-Governmental Organization
Poush	The first month of the winter season
RMG	Ready Made Garment
SDG	Sustainable Development Goal
SPSS	Statistical Package for Social Sciences
SSC	Secondary School Certificate
TU	Trade Union
UN	United Nations
UNEP	United Nations Environment Programme



UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
USD	U.S. Dollar
VDP	Village Defence Party
ZDHC	Zero Discharger of Hazardous Chemicals

## EXECUTIVE SUMMARY

While working in an RMG factory, Julekha suddenly faints due to extreme heat. This is only an anecdotal example, but it's now a regular occurrence in summer time in garment factories in Bangladesh. Climate change induced excessive heat and environmental factors such as poisonous gases in the air or lack of oxygen in the workplace are probably the underlying cause. Establishing one to one correlation between faintness and climate change and/or environmental factors although not impossible, but most challenging, time consuming, and expensive. Secondly, RMG workers, in general, have a poor educational status. Having this context, assessing the impact of climate change and/or environmental reasons on the lives of garment workers and within the RMG factories is rather difficult. This research endeavoured a miniature step to tackle this daunting task.

There is no room to claim that research findings are cent percent accurate. However, this research deserves to be considered one of the pioneering in its analysis of the impact of climate change and environmental issues on the lives of garment workers and within the RMG factory in Bangladesh.

Quantitatively, this research has surveyed a representative of 402 RMG workers from 21 clusters and 160 RMG factories from Gazipur and Tongji Police Station Areas in Bangladesh, while environmental and climate change implications are reportedly more prominent in these locations. Considering the research essence and target audiences, descriptive research statistics and univariate analysis are particularly emphasized. Secondly, a rich set of qualitative research is administered. Available literature is collected, that made a first-hand scanning, and identified climate change and environmental issues and concerns and developed necessary data collection tools. A comprehensive review of literature is done to 1) supplement research findings and 2) encounter gaps that came out from the analysis of primarily data. Apart from these, primary data are collected from trade union leaders, employers, senior factory managers, community peoples, GOV representatives, CSOs, media persons, and experts.

More explicitly, this research looks at four main climate change and environmental aspects associated with RMG workers such as 1) climate change and environmental issues, concerns, and vulnerabilities of RMG workers at living place, 2) climate change & environmental issues, concerns, and vulnerabilities of RMG workers inside factories, 3) grievance mechanisms to climate change and environmental causes, and 4) TU capacity to deal with RMG workers climate change & environmental causes. Finally, a comprehensive set of recommendations have been drawn to act by the trade unions. Findings are really convincing.

### **Climate Change and environmental issues, concerns, and vulnerabilities of workers at living place:**

#### **Level of awareness:**

One in every two workers have previously heard about climate change and three out of every four workers are conscious about environmental aspects. Half of the workers consider climate change as a reason for seasonal variations, one-quarter identified environmental factors as a main cause, and one-fifth said that it is almighty given.

### CC and environmental migration:

99% RMG workers are internal migrants. One-fourth internal migration is related to a climate change symptom like crop failure or loss of productivity or loss of last source of income for flood, cyclone, drought, and increase in pest infestation. For nearly one-tenth, environmental reasons particularly river-bank erosion is a main cause for migration.

### CC and Environmental causes and Support giving and receiving:

Many RMG workers are either dependent on village homes for living or give some support to the village homes. Amount of giving and receiving support varied significantly in the last five years. More than one-third have identified environmental reasons and another around one-seventh climate change as a main cause for this.

### Status of resources use efficiency at living places:

Climate mitigation efforts have traditionally focused on enhancing resources use efficiency. This research has studied 1) water use efficiency, 2) electricity use efficiency, 3) electric fan use efficiency, 4) gas use efficiency, and 5) solar power use efficiency at living places. Research findings show that the current resource consumption practices by the RMG workers at living places are 83% inefficient. Electric fan, gas and solar power usage are analysed most inefficient, meaning that their usage has increased significantly over time.

### Status of climate change at living places:

Studying seven variables such as 1) hot, 2) flooding, 3) storms/cyclones, 4) heavy rainfall, 5) rainfall, 6) drought and 7) wind, this research has established that at aggregate level the climate has changed negatively for about one-tenth percentage point in the last five years. This means that workers' suffering at living have increased nearly one-tenth because of climate change symptoms. Specifically, heat and hotness and drought have increased, and the quantity of rainfall, wind flow, flood, cyclones, and heavy rainfall have decreased over time.

### Health vulnerability:

Three main health vulnerabilities due to climate variability are analysed common at living places such as 1) increased diseases, 2) increased mosquito/pest/insect attacks, and 3) new diseases and mosquito-borne diseases.

### Implications on working life:

Studying five climate change symptoms such as 1) heat and hotness, 2) flooding, 3) cyclones/storms, 4) diseases, and 5) water logging, this research has established that one in every two workers either had to take leave or suffers a capacity, production or income loss for these. Individually, one in every five workers had to take leave due to the mentioned climatic symptoms and one in every ten workers reported a capacity loss to them for these.

## **Environmental issues and concerns at living places:**

### **Water pollution:**

Water pollution has been rapid. One in every two workers report an increase in water pollution compared to three years before. Quantity and shapes of water sources have shrunk drastically.

### **Air pollution:**

Three out of every four workers report an increase in air pollution. Smoke and dust from production processes, and sanitation practices are reportedly main causes for air pollution. Associated with air pollution, headache, dizziness, tiredness and breathing problems are reported as common.

### **Water logging:**

One in every ten workers have reported serious waterlogging in Tongi. Drainage congestion, heavy rain, and environmental reasons are identified as the main causes.

### **Increased diseases:**

Associated with environmental causes, mosquito borne diseases and their manifestations including death reported on an ever-increasing trend. Among others, shortness of breath, headache, nausea, dizziness, itching, and cramps are reported common.

### **Poor availability of fresh oxygen:**

One in every three workers report that their living conditions are not environmentally safe, they have inadequate ventilation arrangement and the living place is always dark.

### **Drain overflow regularly:**

Poor drainage and associated implications like dirty, overflowing, discharge in natural water sources, and air pollution are frequently reported.

### **Unhealthy Sanitation Practices:**

One in every three workers expressed a concern regarding sanitation and hygiene practices. Too many users, unsustainable construction and discharge into natural water sources are three main environmental concerns reported frequently.

### **Non-environment friendly waste management practices:**

One in every three workers expressed a serious environmental concern about current waste management practices, and a further one-third an average concern. One in every ten workers said solid household waste is dumped indiscriminately into natural water sources.

### **Groundwater depletion:**

Ground water usage increases ever in the last five years. From only 170-180 feet deep, ground water level now reportedly has depleted to nearly 400 feet deep.

### **Fish species extinct:**

Fish species in the local water sources reportedly have gone extinct totally or only a very few that exist today have turned poisonous.

### **Rapid transformation of agricultural land to industrial production purposes:**

All the trees have been cut. Structured housing and human settlements for industrialisation have occupied a good amount of agricultural land.

### **CC and environmental issues, concerns, and vulnerabilities of workers inside factories**

#### **Resources consumption efficiency:**

Studying nine variables such as 1) electricity consumption, 2) AC usage, 3) electric fan usage, 4) generator usage, 5) petroleum and diesel usage, 6) water consumption, 7) gas usage, 8) chemical usage, and 9) solar power usage, this research has analysed that at aggregate level the current status of resource consumption in the RMG factories is 60% inefficient. AC and electric fan usage are most inefficient, followed by electricity consumption, water consumption, gas consumption, petroleum/diesel consumption, generator usage and chemical usage. On average, resource usage/consumption has increased around 38%.

#### **CC symptoms and concerns inside factories:**

Six out of every ten workers have reported high to extreme heat and hotness inside the factories. One in every ten workers said it feels like boiling. One in every two workers claimed extreme heat and hotness continues 7/8 months a year. Three out of every four workers have reported a health vulnerability from heat and hotness inside the factories. Among health vulnerabilities, dehydration, headache, dizziness, and faintness are reported common. Apart from health vulnerability, absence/leave, productivity loss, violent behaviour, employment insecurity and income loss are frequently reported from heat and hotness. Normal heat and hotness inside many green factories also are reported.

#### **Environmental issues and concerns inside factories:**

Of the environmental issues and concerns inside factories, legal and administrative flaws are reported to the tops such as no environment protection policy, no resources usage guidelines (electricity, water, gas, etc.), no water treatment plant, structural flaws, lack of concern for environment protection, technological inadequacies and no care and remedy. Apart from legal flaws, particularly associated with the production processes, water pollution, air pollution, sound pollution, high water consumption in washing and dyeing, excessive resources usage, dirtiness, insufficient ventilation, excessive chemical usage, and waste discharge to the natural environment are frequently reported.

Good environmental practices too are very likely in many factories. One in every two workers claimed that their factories have formulated environment protection policy and resources usage guidelines. Improve waste management practices, installation of water treatment plants, water pollution control, sound pollution control, proper treatment of solid wastes, rainwater harvesting, and adoption of new technology are few other good practices more or less reported.

### Liquid waste management practices and respective implications:

Only, one-tenth factories reportedly have functional ETP. Seven out of every ten workers claimed that liquid wastes are directly discharged into the natural water system through local drains which is a main cause for water pollution, air pollution, and unhealthy outside.

### Non-environment friendly Chemical waste management:

Including 1) colours, 2) auxiliary chemicals, 3) basic chemicals, and 4) chemicals for printing, more than two hundred (200) chemicals are consistently in use in a washing and dyeing unit of an RMG factory. Chemicals having mixed with water turned as contaminated colored-water and frequently discharged into natural water systems without proper treatment. Identification of ZDHC (Zero Discharger of Hazardous Chemicals) approved safe chemicals involves a complex and lengthy process. Only a very few RMG factories use ZDHC approved chemicals, and mostly not. Chemical waste is a main cause for water pollution, mosquito growing and increased diseases, reported the workers.

### Solid wastes management and respective implications:

Among solid wastes, polythene waste, plastic wastes, packaging wastes and basic wastes such as unused cloth, and threads and nylon and paper are reported common. This research didn't find any proper treatment practices of solid wastes. Reportedly, solid wastes are mostly sold out, and the rest are just dumped elsewhere, and not a concern to employers.

### Greening the industry:

Around 200 RMG factories have transformed to green factories. Greening has been particularly done in two aspects i.e., 1) operational and maintenance aspects and 2) structural aspects. Among greening initiatives, replacing of traditional bulbs and electric fans with less power consuming LED bulbs and fans and installation of meter, servo motor, thermal-oil heating system, economizer, condensate recovery system, biogas plant, solar panel and ETP are reported common. Few factories reportedly have set optimum standards for air and water usage. Green factory workers have, in general, rated a comparatively better physical working environment, particularly the heat control system in the green factories, than non-green factories. However, employers are reluctant to refer to the entire greening initiative as a business case other than an essence to encounter climate change or environmental concerns, and are critical of the financial arrangement for greening. Workers representatives have not been part of the greening processes.

### Grievance Mechanisms in Environmental and Climate Change Causes

#### Grievance mechanisms at community:

Studying 12 variables such as assigned person/authority/institution to look after environment and/or CC matters, status of legal framework, reporting channel, monitoring and supervision aspects, accountability arrangement, level of awareness and knowledge on prevailing grievance arrangements and such others, this research has analysed that the current status of environmental and climate change grievance mechanisms

at community level are weak and unresponsive to community demand. There is a lack of awareness and role clarity, power and authority conflict, lack of accountability arrangement, poor legal implementation and whatever step is taken, the solution is uncertain. At aggregate level, existing grievance mechanisms have been analysed 79% ineffective and only 21% effective.

#### Grievance mechanism inside factory:

Studying twelve variables such as availability of responsible person/authority/institution, legal framework and standards, grievance reporting and recording procedures, status of complaint reporting and solution, and level of awareness and knowledge of workers and such others, this research has analysed that existing environmental and climate change grievance mechanisms inside the factories are 70% ineffective and unresponsive and only 30% effective. Buyers/brands though have a consistent pressure for energy, gas, and water use cut, for adoption of new technology and improving of waste management practices including chemical wastes.

#### TU capacity to deal with climate change & environmental causes:

Studying seven variables such as level of awareness of workers and trade unions, status of participation and engagement, status of social dialogue, status of active role from TUs and Skills and capacity of the TUs to deal with CC and environmental matters in the RMG industry and others, this research has analysed that trade unions have on average 54% capacity gaps in dealing with environmental and climate change aspects of RMG workers both at community life and inside factories. The status of participation in legal formulation and implementation and the level of understanding and awareness have been assessed most dissatisfactory.

#### Recommendations:

RMG workers, union leaders, employers, managers, community peoples and different other right bearer stakeholders have proposed a good number of recommendations as flowing:

#### Especially for Trade Unions:

- Generate workers and TU friendly appropriate knowledge and resources
- Inform, educate, and equip trade unions to effectively address worker's CC and environmental issues and concerns both at living place and inside factories
- Initiate massive campaign to aware and mobilise RMG workers on climate change and environmental aspects
- Educate/aware yourself. Proactively engage in environmental stewardship
- Ensure proper training for workers and TUs to enhance their bargaining and negotiating skills on climate change and environmental issues in the bi-partite and tripartite processes
- Act to establish dedicated tripartite social dialogue to deal with legal matters in the RMG industries.
- Act to ensure workers and TU participation in all climate change and environmental legal formulation and implementation processes like green transition matter

- Develop common TU position paper and initiate strong policy advocacy and lobby
- Act to engage meaningfully at workers' living place particularly on climate change and environmental grievance mechanisms of RMG workers.

#### To Address Inside Factories

- Arrange for proper heat and hotness control, ventilation, and air-cooling facilities.
- Ensure proper and rational use of chemicals. Address chemical odours.
- Ensure safe drinking water and proper healthcare facilities for workers.
- Address noise pollution at work.
- Address water pollution control. Establish functional ETP in the factories.
- Ensure effective wastes management and hygienic sanitation facilities in the workplace.
- Initiate to address smoke and dust control inside the factory.
- Establish a proper and responsive legal regime.
- Enhance strong monitoring systems.
- Ensure employers accountability to environment and climate change protection.

#### To Address at Community Level

- Build environmental and climate change awareness of worker's communities.
- Ensure proper waste management infrastructure, system and control.
- Develop the drainage system.
- Initiate to address already polluted water and air.
- Set standards, formulate rules/regulations for resource usage and inform the community.
- Take immediate steps to eliminate waterlogging
- Take appropriate measures for insects and mosquitoes' control.
- Takes measures to control noise pollution
- Ensure healthy and hygienic sanitation systems for the communities.
- Ensure proper social reforestation and protect and prevent heat waves.
- Engage employers and house owners in environmental protection in the community.
- Establish rules, ensure strict enforcement of rules and strict monitoring.
- Ensure accountability of the concerned local government institutions and authorities.



## SECTION ONE

### Introduction and Methodology

#### The Setting

Fundamentally, 'sustainable development' includes three main components: 1) economic, 2) social and 3) environmental sustainability. However, to attain economic and social sustainability, long-term environmental safety and security is the first prerequisite. Continued industrial development is detrimental to environmental health through affecting e.g. water and air quality as well as soil health. Global warming induced climate change is an added concern to environmental sustainability. Climate change refers to a faster increase of the earth's average surface temperature such as tropospheric temperature, humidity, temperature over oceans, sea surface temperature, sea level, sea ice and ocean heat content. This is caused primarily by increases in greenhouse gases which create heat traps through restricting energy radiation to a comparatively reduced pace. Available data estimates that annual GHG emissions grew on average by 1.0 gigatons carbon dioxide equivalent (GtCO<sub>2</sub>eq) (2.2%) from 2000 to 2010, compared to 0.4 GtCO<sub>2</sub>eq (1.3%) per year from 1970 to 2000. There is a scientific consensus that increased average earth surface temperatures are associated with the intensity and severity of extreme climatic events like drought, heat and hot, floods and cyclones, which carries serious potential to destabilize natural environment.

These changes in environmental health increase the burden on economic and social sustainability, and disproportionately affect wage labourers. Assuming a global temperature increase of 1.5°C by the end of the 21st century, the ILO estimates that by 2030, 2.2% of total working hours will be lost due to heat stress. This would result in a productivity loss equivalent to 80 million full-time jobs, or US\$2.4 trillion (PPP) (ILO 2019). According to a report by the UNDRR and the CRED (2020), climate-related disasters, which include extreme weather events, have increased considerably – growing from 3,656 climate-related disasters from 1980–1999 to 6,681 during 2000–2019. During this time, the number of storms increased from 1,457 to 2,043 disasters, and major floods from 1,389 to 3,254. These disasters, as the report concludes, have led to the loss of 1.23 million lives, had an impact on 4.2 billion people, and prompted global economic losses of US\$2.97 trillion.

The clothing industry is considered one of the world's most environmentally damaging and carbon intensive industries. Various reports have documented the contribution of the ready-made garments (RMG) industry to climate change and environmental degradation. A UK Environmental Audit Committee in 2019 categorically stated that "Garment production contributes more to climate change than international aviation and shipping combined, consumes lake-sized volumes of fresh water and creates chemical and plastic pollution". The report further claimed that the way we make, use and throw away our clothes is unsustainable. According to this report, the clothing sector's usage of energy and carbon emissions amounted to the equivalent of 1.7 billion tons of carbon dioxide in 2015 (House of Commons Environmental Audit Committee 2019). Available estimates suggest that the clothing industry alone contributes 6-8% of global carbon emissions (Dr

Samantha Sharpe ISF-UTS, ILO Knowledge Partner). A 2017 report from the Ellen MacArthur Foundation finds that the fashion industry uses approximately 79 billion cubic meters of fresh water annually across the entire value chain. Large volumes of wastewater containing hazardous substances are released into rivers and water courses without appropriate treatment, leading to an estimated 20% of the world's industrial water pollution (EMF 2017).

The burden of climate change and environmentally negative consequences also negatively affect clothing sector workers.

In addition to extreme weather events such as excessive heat, flooding and the impacts of cyclones, through their work in Cambodia, Parsons et al have documented four main negative implications of climate change in the RMG workers circumstances i.e., 1) the reshaping the workplace, 2) the reordering social relationships, 3) a reduction in productivity, and 4) worsening worker health. Their research further suggests that climate change implications on garment sector workers are largely unattended, both legally and in practice. Lack of awareness of workers is identified as one of the main reasons for this. They further have narrated that factories and unions lack policy to address growing risk of climate change to local environmental impacts in the workplace. Inadequacy of health and safety legislation is reported too (Parsons, L.; Lawreniuk, S.; Sok, S.; and Buckley, J., 2022).

According to ILO research, heat stress caused by climate change has direct human implications in the RMG factories including discomfort, injuries and heat exhaustion. Workplaces with poor ventilation or cooling systems are more vulnerable to health risks, specifically in urban locations, where the intensity of heat waves is more severe (ILO 2019). Better Work found that 17% of RMG factories in Bangladesh, who participate in the Better Work programme, were not compliant with temperature standards at the time of an assessment completed in 2019 (Better work, n.d. 2019).

There is also evidence to suggest that increased heat stress and extreme weather events result in decreased productivity (Kjellstrom et al. 2016). For instance, A study of 26 garment factories in India found that once the temperature inside a factory exceeded 29°C, productivity fell by 3% and profits decreased by 2.2% for every degree increase (Adhvaryu, Kala and Nyshadham 2018).

Mapping data on workers' sick leave and productivity rates against data on extreme weather conditions, Filippo Sebastio (2018) established that an increase in 100 millimetres of average monthly rainfall precipitation resulted in an increase in sick leave rate by 10% per month in Bangladesh.

Filippo Sebastio also found that that diseases spike during extreme weather in Bangladesh. Abundant rainfall combined with poor water- and sewage management systems leads to the spread of waterborne diseases, especially those transmitted by mosquitoes and parasites. The humidity, combined with the heat and fabric dust, makes breathing difficult, exhausts workers' energy and focus, and affects their efficiency and productivity. Based on a large sample size of 15,000 workers, Filippo Sebastio has further calculated that months with an average temperature of 30°C in outside temperature correlated with a productivity decrease of 2% in Bangladesh (Sebastio F. 2018).

As a result of this, decarbonisation programs are becoming increasingly relevant for the RMG industry. The Paris Climate Agreement limits warming to 2°C compared to pre-industrial levels. To achieve this target, globally emissions must be reduced by 45% by 2030, including a net zero by 2050. In 2015 the fashion sector stakeholders have formed the UNFCCC Fashion Industry Charter for Climate Action, committing to 30% emissions reduction by 2030, based on 2015 values. Green production processes have moved into the focus of the industry worldwide. This includes the least environmental harm, reduction of resource consumption and the limitation of carbon emissions. Bangladesh is playing a leading role in this. Bangladesh also pledged at the Glasgow Climate Summit to reduce 22% carbon emissions by 2030. Bangladesh's RMG industry is one of the major sectors to achieve this target. The RMG sector has now around 200 green factories (as of March 2024) certified with the Leadership in Energy and Environmental Design (LEED). These factories have successfully achieved to cut down their energy usage by 40% and water consumption by more than 30%. The conservation and development of environment and biodiversity has been included as a principle of state governance in the Fifteenth Amendment of the Bangladesh Constitution (Act No. 14 of 2011). However, reducing carbon emission is not enough. Adhering to the Paris Agreement and commitments, an inclusive, fair and equitable economic and social transformation is equally required.

The global trade union movement has rightly developed the concept of “Just Transition” into a leading role in environmental strategy. Just Transition is defined as “greening the economy in a way that is as fair and inclusive as possible to everyone concerned, creating decent work opportunities and leaving no one behind” (ILO 17). “There is considerable potential for creation of decent work associated with the transition to a low-carbon sustainable development path and to minimise and manage the inevitable dislocation that will accompany it,” said Guy Ryder, Director General ILO.

One of the core emphases in Just Transition is inclusion and participation. The workers and their legislative representatives - the trade unions - have, however, not been part of the RMG factories green transition processes, yet. This for example shows in the LEED certified factories, as almost no LEED certified factories have establishment-based trade unions.

A second key concern is that workers in general and particularly trade unions lack sufficient information, skills and resources to take workers' environmental and climate rights related issues into their political priority agenda. This is due to a lack of awareness and knowledge to envision the ongoing and upcoming negative impact on the environment, which is also related to their workplace. Most importantly, the demands of workers are not sufficiently considered in the policy formulation and implementation processes of policies.

In partnering with GIZ, BILS has initiated a development project titled ‘Strengthening Trade Unions’ Capacities for a Green Social Dialogue in Bangladesh’s RMG Sector’. To enable trade unions at local and national level to effectively advocate for workers’ rights on climate, environmental and social issues, particularly in the context of the country’s RMG industry. The core mission is to facilitate a culture of social dialogue through encouraging 1) national level trade unions to demand workers’ environmental and social rights for workers, as well as develop 2) a network of women and youth trade union activists to carry forward

the demands of trade unions at the very community level. For all of these to happen, producing authentic and unbiased information and knowledge base is a first and foremost pre-requisite.

The mainstay of this study is to portray a complete picture of the climatic and environmental vulnerabilities of the RMG workers both at community level and inside the factories. The implementation of green aspects within factories, the corresponding political prospects and corresponding loopholes will also be described in this study. A second main emphasis is to assess the strength and readiness of the respective stakeholders, particularly workers representatives to act on climate and environmental aspects. This report narrates the research findings.

### **Research Objectives**

- Assessing climate change & environmental issues, concerns, vulnerabilities, & protection of RMG workers at living place
- Assessing CC & environmental issues, concerns, vulnerabilities & protection inside RMG factories
- Assessing grievance mechanisms to CC & environmental causes both in communities and inside factories
- Assessing TU capacity to deal with RMG workers CC & environmental causes both at community & inside factories
- Developing a comprehensive set of recommendations to act on by the TUs

### **Methodology**

A combination of 1) quantitative and 2) qualitative research approaches, methods and respective tools and techniques are adopted. Data collected from both 1) primary and 2) secondary sources.

### **Scope and Coverage**

Only RMG workers and factories from Bangladesh's Gazipur and Tongi municipality areas are covered in this study. More specifically, the research includes Gazipur Sader police station and Tongi police station. This is because these two administrative police station areas have a higher concentration of RMG factories, roughly around 500. Environmental and climate change implications are more prominent in these two locations too. Workers from both green and non-green factories are covered.

The population density of the Gazipur City Corporation including Tongi is 2,156 inhabitants per square kilometer, which is higher than the national average of 1,119 people in 2022. . Urban area changes varied from 1% in 2000 to nearly 30% in 2021. A portion of the fertile agricultural land has shifted to other uses as a result of rising urbanization. In Gazipur Sader, the forest cover decreased by more than 40%. Such dramatic shifts have generated severe environmental repercussions. The groundwater reserves are at risk, as 85% of the urban water demand is covered by groundwater, which leads to a constant decline in the average groundwater level of more than 2 meters per year. In addition the recharge and uneven abstraction has also have a substantial impact (Jowaher Raza et al 2019).

## Research Population

Initially, a participatory rapid census is conducted and found that roughly 263,000 workers are employed in around 485 RMG factories within the study locales. This figure makes up the research population. However, the target group consists of the entirety of all RMG workers. Worth mentioning is that this figure is consistent with the available estimations. BGMEA, administered one of the most well-known research portals ‘Mapped in Bangladesh’, which has listed 467 RMG factories in the research locales.

## Sampling

A total of 402 representative RMG workers from 21 clusters and 160 RMG factories took part in the survey. A multistage cluster sampling method is used to select the representative respondents for the survey. In a first step, 1) Tongi police station and 2) Gazipur police station areas are selected as primary sampling units. They constitute a GIZ-BILS project locale. Secondly, these locations have a high concentration of RMG factories. In a later step, 21 clusters of secondary sampling units are selected in Gazipur and Tongi based on the concentration of RMG workers’ residential areas. In a third and final step, 384 samples are initially selected for the survey based on the following scientifically accepted representative statistical formula and in consideration of a confidence level of 95% and a margin of error of 5%:

$$\frac{z^2 \times p(1-p)}{e^2} \div \left( 1 + \frac{z^2 \times p(1-p)}{e^2 N} \right)$$

In this formula,  
 Z = z score  
 e = Margin of error  
 N= Population size  
 P = Population proportion

**Table 1: Sampling**

SL	Areas having workers concentrations	Factories (Tentative)	Workers (Tentative)	Sample size
TONGI				
01	Miraj Para (boubazar/Jamaibazar)	50	25,000	38
02	Ershadnagar	10	7000	11
03	Satyish	25	13000	20
04	Dottopara	10	4000	6
05	Ouchpara	10	4000	6
06	Masimpur	10	4000	6
07	Arichpur	10	7000	11
08	Pagar/Jhinu Market/BSIC area	50	25000	40
09	Borobari/Kunia	10	7000	11
10	Morkun/West Para/Shilmoon	25	12000	18

GAZIPUR				
11	Joydevpur (Gazipur C	10	4000	6
12	Laksmipur	15	7500	11
13	Konabari (Kashimpur/bipile/ambaj)	70	18000	27
14	Bason	20	12500	19
15	Gacha/kunia patchor	10	6000	9
16	Khoilekur	25	13500	21
17	Maleker Bari	25	13500	21
18	Maowna, Sreepur	50	25000	38
19	Masterbari, Sreepur	10	20000	30
20	Hotapara, Sreepur	25	20000	30
21	MC Bazar/Joina Bazar	15	15000	23
Total		485	263,000	402

Later on, the sample size is adjusted and increased to 402 in order to ensure that the clusters surveyed are adequately represented. In proportion to the survey population (workers), 402 samples are distributed across the selected 21 clusters. Since, a comprehensive RMG workers database is not available, final survey respondents are selected purposively in which availability and travel and communication easiness are emphasized most.

To ensure a double check of right respondent selection, along with post-graduate level interns, ten young trade unionists are deployed as data enumerators who have survey clusters in a base working area. The data collectors are trained adequately to minimise response and non-response errors.

### Qualitative research

A huge qualitative research is also administered. This was necessary to encounter gaps which appeared from analysis of quantitatively collected data and to address non-sampling errors.

### Methods and tools and techniques

**Survey:** Survey method is particularly used to collect quantitative data from the RMG workers. A structured survey schedule consisting of dichotomous, polychotomous, multiple response, Likert scale, and some open-ended variables are used for data collection in the survey. The survey schedule was initially developed in English and then translated into Bengali.

**FGD:** Focus Group Discussion (FGD) is conducted to collect data from the people in the community, in which the RMG workers live. 2 FGDs are conducted, first one in Tongi, and the second one in Gazipur. A pre-developed FGD checklist and guidelines are used for this.

**Interview:** To collect RMG executives' views on the research matter and to crosscheck information from the quantitative survey and literature review, interviews are held with two from Gazipur and two from Tongi, thus 4 top level RMG executives including owners. Similarly, a few CSO/NGO representatives and concerned government officers are interviewed. Various checklists and guidelines were developed beforehand for each stakeholder.

**Table 2: Qualitative research**

SL	Method	No	Participants
A	FGD	2	Community people, 1 at Tongi area and 1 at Gazipur area
B	Employers Interview	3	Employers, 2 at Tongi & 2 at Gazipur
C	Interview with Managers	3	Factory managers, 2 at Tongi & 2 at Gazipur
D	Interview with CSO/NGO & Experts	2	NGO/CSO/Experts/Academics
E	Interview with Government	2	DIFE/DoL/MoE/Local Govt
F	Consultation	1	TU leaders
G	Case Study Collection	2	Workers
H	Discussion/Meeting	-	Series of with BILS & GIZ
I	Desk-review	1	Secondary literature

**Consultation meeting:** A consultation meeting with trade union leaders at national level is being organised to gather the views of trade unions on the research and assess their knowledge and capacity. 25 high-level national trade union leaders participated in the consultation. A prepared checklist and guidelines were used for this consultation.

**Case study collection:** Two case studies were collected, one from Gazipur and one from Tongi. Finally, two different cases identified during the survey of workers are analysed in detail. A prepared checklist and guidelines were used to collect the case studies.

**Desk-based review:** Throughout the research period the available literature was analysed. First, the available literature relevant to climate change and environmental issues of Bangladesh's RMG industry was collected, reviewed first-hand, and the survey schedule and a set of checklists were developed. Secondly, the review of collected literature was continued throughout the research period to 1) supplement the research findings and 2) come across gaps that emerged while analysing the primarily collected data.

### Data Analysis

Quantitative data are processed and analysed using SPSS software. Tables and charts have been used to present data. By nature, it is a descriptive research and descriptive research statistics are emphasized. Considering the audience and users of the research report and findings, univariate analysis is particularly conducted.

On the other hand, qualitative data are transcribed and coded and re-coded. Later, identified codes are grouped under different themes as required to meet the objectives. Findings derived from qualitative data analysis are particularly synchronised with the themes of quantitative findings for the purpose of complementing and explaining the findings.

### **Key demographic data**

Among the respondents, 37% are from green factories, and the rest 63% worked in the non-green factories. More than two-third (68%) of workers are women and 32% are men. Among the workers, 85% are married. 13% of unmarried workers are detected. Mean age of workers was 28.5 years. 96% of workers are below 42 years of age, 72% are below 32 years of age. 14% of the workers have never gone to school, they can only sign, few of them can read, and the rest of them are illiterate. Another 32% of workers have studied between first to fifth grades. Overall, 80% of the workers have an education status that is below the 10th grade.



## **SECTION TWO**

### **Climate Change and Environmental Causes and Vulnerabilities at Living Places**

The study has analysed the causes of climate change and environmental causes and vulnerabilities of the RMG workers at the community level. For this purpose, quantitative research has been conducted that furthermore analysed every potential stakeholder qualitatively. To contextualize the research findings, most concurrent secondary literatures have been reviewed on this. In combination of these three sources of information, the following analysis concentrates on the prevailing climate change and environmental causes and vulnerabilities of the Bangladeshi RMG workers at the community place.

To maintain a consistency within the analysis, an assessment of climate change and environmental awareness of RMG workers is done first. This is followed by an evaluation of how many of the RMG workers are climate and environmental migrants and the respective other main features on this. For environmental protection and reduced carbon emission, efficient use of available resources is a development target worldwide. In the third section, an evidence-based analysis is made of the efficiency and inefficiency of resource usage by the RMG workers at community level. Fourthly, considering the seven most persisting climate change parameters, both positive and negative aspects of climate change and their respective implications on RMG workers health and on their working life have been analysed. Finally, in the last section we looked in detail at environmental issues and concerns.

#### **CC and environmental awareness**

RMG workers are mostly internal migrants. This research finds that 99% of RMG workers have migrated from a second place inside the country. Like many previous studies, this research finds that poverty (85%) is the main driver for internal migration. However, this research is the first to identify climate change and environmental migrants among the RMG workers. For every reason of poverty and scarcity cited, we go on to explore the cause behind it. It is also investigated qualitatively. In the end, it is concluded that among the RMG workers, 36% are climate migrants and 7% are environmental migrants. It is for crop failure or loss of productivity or loss of last source of income, particularly associated with climate change symptoms like flood, cyclone, drought, and increase in pest infestation that these 36% were pushed to migrate to Gazipur and Tongi to take on an RMG job. To be noted clearly, research team capture only the symptoms, didn't go on exploring one to one correlation between climate change and symptoms identified. Among the environmental causes of migration, riverbank erosion and thus loss of homes and livelihoods are most commonly reported. "For around 10% workers migration, the reason is riverbank erosion.", said a group of people in an FGD from Tongi. It is worth noting that it was not investigated a one-to-one correlation for this. A total of 1% of internal migration was recorded as politically motivated.

**Table 3: Climate change and environmental awareness/understanding**

Climate change awareness		Environmental awareness	
Status	%	Status	%
Yes	52.0 (209)	Yes	75.6 (304)
No	48.0 (193)	No	24.4 (98)
Total	100 (402)	Total	100.0 (402)
Major changes in the seasonal patterns		Reasons for seasonal variation	
Extended summer	81.8% (329)	Climate change as a reason	49.5 (199)
Reduced winter	51.5% (207)	Environmental reason (Pollution)	25.1 (118)
Reduced rainy season	43.3% (174)	Allah given	20.2 (95)
More rain in winter	4.2% (17)	Natural reason	5.0 (20)
More hot days	89.8% (361)	Don't know	38.3 (154)
Less cold days	21.1% (85)	Sin	1.5 (7)
Fog in summer	0.5% (2)		
Hot wind	25.4 (120)		
Air pollution	23.7 (112)		
Unseasonal rain	13.7% (55)		
Equal heat and hot at day & night	2.4% (14)		

**CC and environmental migration and relevant issues**

RMG workers are mostly internal migrants. This research finds that 99% of RMG workers have migrated from a second place inside the country. Like many previous studies, this research finds that poverty (85%) is the main driver for internal migration. However, this research is the first to identify climate change and environmental migrants among the RMG workers. For every reason of poverty and scarcity cited, we go on to explore the cause behind it. It is also investigated qualitatively. In the end, it is concluded that among the RMG workers, 36% are climate migrants and 7% are environmental migrants. It is for crop failure or loss of productivity or loss of last source of income, particularly associated with climate change effects like flood, cyclone, drought, and increase in pest infestation that these 36% were pushed to migrate to Gazipur and Tongi to take on an RMG job. Among the environmental causes of migration, riverbank erosion and thus loss of homes and livelihoods are most commonly reported. "For around 10% workers migration, the reason is riverbank erosion.", said a group of people in an FGD from Tongi. It is worth noting that we did not investigate a one-to-one correlation for this. A total of 1% of internal migration was recorded as politically motivated.

**Table 4: CC & Environmental migration and relevant issues**

Status of migration		Reasons for migration	
Status	%	Status	%
Self-migration	21.1 (85)	Poverty	85.1 (342)
Entire family together	64.2 (258)	Environmental reason (river bank erosion)	7.2 (29)
Parents migrate earlier	9.5 (38)	Political	1.0 (4)
With family members (sister/husband/relatives)	4.2 (17)	Climate related reasons (Flood, drought, cyclone, crop failure, increase pest attack, productivity loss)	35.8 (144)
Birthplace, did not migrate	1.0 (4)		
<b>Total</b>	<b>100 (402)</b>	<b>Total</b>	<b>129.1 (518)</b>
Support Taken from village home		Support provided to village home	
Financial support	6.97 (28)	send money regularly	40.1 (161)
Food & fish	19.15 (77)	send money occasionally	24.8 (100)
Family lives in village	0.50 (2)	food & cloth	0.3 (1)
Children live in village	1.74 (7)	health support	0.9 (3)
Others	0.75 (3)	education support	1.4 (6)
<b>Total</b>	<b>29.1 (117)</b>	<b>Total</b>	<b>67.4 (271)</b>
Any change over time		Any change over time	
Increase	22.0 (26)	Increase	37.2 (101)
Decrease	43.1 (50)	Decrease	32.4 (88)
Same	30.3 (35)	Same	26.8 (73)
Others	4.6 (5)	Others	3.6 (10)
<b>Total</b>	<b>100.0 (117)</b>	<b>Total</b>	<b>100 (271)</b>
Reasons for Increase/Decrease		Reasons for Increase/Decrease	
Climate change	14.5 (11)	climate reasons	7.1 (19)
Environmental reasons	38.2 (29)	environmental reasons	41.8 (113)
Others	38.2 (29)	Others	48.8 (132)
Increased income	9.2 (7)	Loan	1.2 (3)
		parents death	1.2 (3)
<b>Total</b>	<b>100.0 (76)</b>	<b>Total</b>	<b>100 (271)</b>

Despite living in Gazipur and Tongi, many RMG workers maintain close ties with their village homes. 29% of workers reported in the survey that they regularly take some support from the village home to maintain

their livelihood, such as food and fish support (19%) and financial support (7%). At least 9 workers said that either their family or their children live in the village home since they cannot afford to live together. Among these support takers, 43% also reported a decrease in support and another 22% an increase in support in the last couple of years. Environmental reasons (38%) and climate change (15%) were cited as the two main reasons.

Conversely, 67% of workers have reported that they need to provide some support to the village home on a regular basis. Among the support givers, 37% also reported an increase and another 32% a decrease in support over the last five years period. Again, when explored further, environmental reasons (42%) and climate change (7%) are cited as the two main reasons.

### Status of resources use efficiency at living places

Resources use efficiency indicates a path of generating greater returns from the same or reduced use of resources. The Global Resources Outlook 2019 of the International Resource Panel defines resource use efficiency as achieving higher outputs with lower inputs. Sustainable Development Goal 12 is directed to bring about efficiency in natural resources usage as a pre-condition to sustainably achieve economic growth. Goal 6 and 7 further emphasize efficient use of water and energy resources. For sustainable economic growth, it is inevitable to contribute to the well-being through reducing environmental impacts.

Climate mitigation efforts have traditionally focused on enhancing energy use efficiency and accelerating the transition to renewables (IRP (2020)). The International Resource Panel investigated the overall potentials and implications of resource efficiency (UNEP 2017) and found that a reduced use of resources can cause global greenhouse gas emissions reduction by up to 20% in 2050. The Bangladesh government has a clear commitment to work on the SDG target and to reduce carbon emission drastically. National planning documents like the perspective plan and 8th five-year plan have set clear emphasis on this.

**Table 5: Resource use efficiency**

Status of resources usage	More	Same	Less	No/ wast-age	Aggregate
Water usage	-63.9	-21.4	13.4	-1.3	-73.2
Electricity usage	-72.7	-14.4	12.9	-	-74.2
Electric fan usage	-97.4	-2.6	-	-	-100
Gas usage	-74.4	-15.9	8.7	-1	-82.6
Solar power usage	5.3	1.7	-3.2	-89.8	-86
Aggregate total efficiency/inefficiency					-83%
Aggregate average inefficient use of resources	-92%				
Aggregate average efficient use of resources	8%				

In this research, the status of resource consumption practices by the RMG workers at living has been studied. Related to climate change and environmental protection, the study considered five variables to determine the resource use efficiency at living such as 1) water use efficiency, 2) electricity use efficiency, 3) electric fan use efficiency, 4) gas use efficiency, and 5) solar power use efficiency. For every single variable, respondents were given four statuses to choose from, e.g., 1) more, 2) same, 3) less, and 4) waste or no consumption. For each variable, individual respondents determine the current status of consumption compared to 3-5 years ago.

For the first four variables such as 1) water use, 2) electricity use, 3) electric fan use, and 4) gas use, the statuses of same, more, and waste are collectively considered as inefficient use of resources. Only less consumption of these resources is considered as efficient use. For solar power usage, however, the reverse is true. This means, that increased usage of solar power compared to 3-5 years ago is considered efficient usage while less, no, and same consumption are considered as inefficient usage of this resource.

The research analysis suggests that at an aggregated level, the current resource consumption practices by the RMG workers at living are 83% inefficient. The overall average inefficient use of the studied resources is 92%. Electric fan (100%), gas (83%) and solar power (86%) usage are rated as the most inefficient, meaning that their usage instead of reducing has increased significantly over time. On the other hand, the efficiency of water (73%) and electricity (74%) use is slightly better. In only 8% cases, efficient resource use practices are recorded.

**Table 6: Water availability and rain water harvesting**

Seasonal issue in water access		Status of rain water harvesting	
Status	%	Status	%
Scarce in summer	38.4 (157)	Yes, common	10.2 (41)
Available in rainy season	5.4 (22)	Yes, little practice	1.2 (5)
Scarce in winter	5.6 (23)	No practice	88.5 (356)
Same always	50.5 (206)		
Total	102 (408)	Total	100 (402)

Most of the traditional light bulbs have been replaced with the energy-efficient LED bulbs, but the number of light bulb usage and electric fan usage have increased many fold. Overall electricity consumption has increased and diversified. The principal of a local school from Arichpur said, “I have been at this school since 2012. Earlier, I had 12 fans in 12 rooms. Now, it has increased to 22 fans in the same number of rooms. Now it is too hot during summer. Sometimes, fans are needed during winter also”. Mr. Ziaul Kabir Khokon, a community member from Kunia Moddho para of Tongi reported, “Now we use energy lights. But, you see, in this day light, all lights are switched on in all local shops. Now, every house has a TV, and a fridge. AC usage is increasing rapidly. Every day, people are increasing. Due to all these, electricity consumption has increased tremendously”. More than 86% of workers said that their family consumes 30 plus litres of water

per day. 38% of workers report that water availability is poor during summertime. 12% of workers said that they harvest rainwater for household usage. Water cost reportedly has increased than before.

### Status of CC at living places

After determining climate change awareness and climate migration, we go on exploring climate change status at living places. Mostly, structured questionnaires are used. As already established, more than half of the workers know about climate change. Since answers were prior fixed in the structured questions, those who were lacking a climate change know-how, they got to know all the answers one by one. They only pick the answers which they applied in their cases.

The research considers seven variables to determine the climate change status at living such as 1) heat and hot, 2) flooding, 3) storms/cyclones, 4) heavy rainfall, 5) rainfall, 6) drought and 7) wind. For every single variable, respondents were given three statuses to choose from e.g., 1) more, 2) same, or 3) less. In comparison to 3-5 years before, individual respondents determine the current status for each variable. Suppose every surveyed worker was asked individually, is the status of heat and hot the same, more or less than it was 3-5 years before. They were allowed to pick only one option. As such, they testify to all 7 variables and report their answers.

**Table 7: Status of climate change at living places**

Status of climate change	More	Same	Less	Aggregate change
Status of heat and hotness	-89.8	3.5	6.7	-79.6
Status of flooding	-31.8	2.5	65.7	36.4
Status of storms/cyclones	-34.3	3.7	61.9	31.3
Status of heavy rainfall	-11.2	6.5	82.3	77.6
Status of rainfall	15.4	1.5	-83.1	-66.2
Status of drought	-52.2	5.5	42.3	-4.4
Status of wind	10.7	13.9	-75.4	-50.8
Aggregate total climate change		5%		-8%
Aggregate average negative change				-54%
Aggregate average positive change				41%

For 5 variables, such as 1) heat and hotness, 2) flooding, 3) storms/cyclones, 4) heavy rainfall, and 5) drought, the status 'more' is considered to have negative implications on the living conditions. Both the literature review and the qualitative research findings have confirmed that these are already on the rise and people increasingly suffer from them. On the other hand, the status 'less' is considered to have a positive impact on life. However, for the other two variables such as 1) rainfall and 2) wind, the status 'less' is

considered to have a negative impact on life and the status 'more' is considered to have a positive impact. It is repeatedly claimed in the qualitative part of the research that air is already hot and polluted and there is only little rainfall than needed.

The research analysis suggests that 4 variables such as 1) heat and hotness, 2) rainfall, 3) drought and 4) wind have changed negatively. Specifically, heat and hotness and drought have increased, and the quantity of rainfall and wind flow have decreased. As such, the suffering of the workers has increased. On the other hand, three variables such as flood, cyclones, and heavy rainfall have changed positively, meaning that these have decreased over time and as such workers' suffering at community level has dropped. The research analysis further suggests that the overall climate change was 8% negative. This means that workers' suffering at living have increased nearly one-tenth because of climate change. The aggregate average negative change was -54% and the aggregate average positive change was 41%.

The qualitative part of the research also confirmed that heat and hotness have increased both quantitatively and qualitatively. Quantitatively in the sense that the number of hot months and days has increased. In the FGDs it is repeatedly claimed that summer has now extended up to nine months. "Now, only two seasons of work, mostly summer, and little winter. This is the month of Poush, the flowers are supposed to be cold, I'm sitting in a simple t-shirt. I still sleep with the fan on. Winter can be felt only in the village, but not in the city," said a group of community members from Borabari in Tongi. Secondly, from a qualitative perspective, the intensity of the heat has increased. It is often claimed that sometimes it is the same during the day and the night. Ms. Josna Parvin, who is employed at Ansar VDP, reported from Jhinuk market area of Tongi: "This year the winter is too short, reduced to less than two months".

### Health vulnerability from CC

The research has identified two main health vulnerabilities of RMG workers due to climate variability climatic variations. Diseases were reported to have increased significantly compared to 3-5 years before. More than 85% of the workers reported the same. Secondly, 92% of the workers explained that mosquito/pest/insect attacks have increased considerably in the recent past. Among others, new diseases and mosquito-borne diseases are frequently reported.

**Table 8: Health vulnerabilities of workers from climatic variations**

Status of health vulnerability	Increased		Same		Decreased	
	Frequency	%	Frequency	%	Frequency	%
Diseases	342	85.1	11	2.7	49	12.2
Mosquitos/Insects/ Pest attack	371	92.3	13	3.2	18	4.5

### Implications from CC on working life

Five climate change symptoms have been studied independently e.g., 1) heat and hotness, 2) flooding, 3) cyclones/storms, 4) diseases, and 5) water logging. We look for five main impacts on the working lives of

RMG workers from each individual variable such as 1) leave/absence, 2) capacity loss, 3) less production, 4) less income/more price/job insecurity, and 5) no impact.

The research analysis suggests that at aggregate level, implications and no implications were almost fifty-fifty. Specifically, 50% of RMG workers have been affected by the studied climate change symptoms in their working lives and for the remaining 50% we could not identify any implications from these. The highest number of workers (100%) reported being affected by increased diseases, followed by heat and hotness (65%) and the lowest by cyclone/storms (only 22%). 23% of workers reported that they had been forced to take leave or be absent from work on one or more occasions due to the effects of these. “There was heavy rain and waterlogging all around. I got into an accident while coming to the factory and was almost drowning. I need to be absent from my work,” said a worker from Tongi. On average, 13% reported an income loss since they were exposed to either job insecurity or high up commodity prices for the studied variables of climate change. On average, 7% reported capacity loss and another 6% less production as a result of climate change.

“Heads spin and houses get so hot that even children get sick”, said an RMG worker from Gazipur.

“Now, there are only two seasons to work, mostly summer, and little winter. This is the month of *Poush*, the flowers are supposed to be cold, I’m sitting in a simple t-shirt. I still sleep with the fan on. Winter can only be felt only in the village, but not in the city,” said a group of people from the Borabari community of Tongi.

**Table 9: Climate change implications on working life**

Climate Change Issues	Leave/ Absence	Capacity loss	Less production	Less In-come/ more price/ Job insecurity	No	Individual average
Heat and hotness	20.5 (85)	32.3 (134)	12.0 (50)		35.2 (146)	64.8
Flooding	8.0 (32)	-	-	11.7 (47)	80.3 (323)	19.7
Cyclone/storms	5.7 (23)	-	2.0 (8)	14.6 (59)	77.6 (312)	22.4
More diseases	56.9 (256)	4.0 (18)	-	39.1 (176)		100.0
Waterlogging from rainfall	24.9 (100)		17.2 (69)		58.0 (233)	42.0
Aggregate average	23.2	7.26	6.24	13.08	50.22	49.78

### Environmental issues and concerns at living places

RMG workers and community stakeholders felt more comfortable discussing environmental issues. Data enumerators too expressed their great relief to work on environmental aspects rather than on climate change aspects. This research has identified a wide range of environmental issues and concerns in the living places of RMG workers. The environmental issues and concerns are detailed in the following sections:



## Water pollution

Water pollution is another top environmental concern in the locality. 74% of the RMG workers reported that the water used to be pure and fresh, while only 51% of the workers said having fresh water now, indicates a further 18% deteriorating reporting of water quality than before. Addressing a different question, 38% of workers acknowledged that water pollution is mainly associated with environmental causes. Another 36% of workers claimed that water pollution is entirely man-made.

**Table 10: Status of water pollution, air pollution and water logging**

Status of quality	Water quality		Air quality		
	Previously	now	Previously	Now	
Fresh and pure	73.9% (297)	52.8 (212)	71.1 (286)	25.6 (103)	
Average	20.9 (84)	24.4 (98)	19.9 (80)	1.2 (5)	
Polluted	5.2 (21)	22.8 (92)	9.0 (36)	73.1 (294)	
Total	100 (402)	100 (402)	100 (402)	100 (402)	
Status of waterlogging			Status of cooking		
No waterlogging	41.4 (166)	48.7 (196)	Gas burner	50.7 (204)	83.8 (337)
Average	25.4 (102)	37.4 (150)	Wooden stove	47.3 (190)	15.0 (60)
Waterlogging	33.2 (133)		Kerosene stove	2.0 (8)	1.2 (5)
Serious waterlogging		13.9 (156)			
Total	100.0 (402)	100 (402)			

Rivers/canal/ponds in the locality had two main environmental implications. The number and shapes of the rivers, canals and ponds have shrunk drastically. One/two rivers seen in the study locations, it is better to call them dead canal, instead of river. “There used to be many rivers. We also had a big river. Now there are only houses, you see,” said a group of community people in an FGD in Tongi. Secondly, the water has become very polluted. The water has become blackish. If you walk along the river/canal/pond side, in many places, there is a foul smell of water. “The Turag is no longer a river. The real Turag died long time ago. The various chemicals in the factory are constantly polluting the water of the river. It is difficult to pass by the river because of the bad smell, ” said a group of community people from Tongi. In Gacha, Tongi, the research team sat by a pond and talked to a group of community people. Pointing to the pond, they said, ‘You see, the pond water has turned absolutely poisonous. People used to bathe in this pond. Now all the dirty water goes here. 90% of the ponds are the same’. Experts have reported that the discharge of chemical and sanitary waste into the natural water system is one of the main reasons for water pollution in rivers and canal water. According to Mr. Md. Shahabuddin, who is the Principal of Cambridge School and College at Arichpur of Tongi under Gazipur, “The water coming from the mill/factories has a great stench coming from it. Thousands of pieces of clothes from the factory are washed in the Turag river every day. It is a big issue for water pollution. Turag River does not require any soap to wash clothes now.” He further

reported that old pipes have rusted and burst, mixing with the drain water. Now, even the supply water is very smelly and dirty and risky to drink. Nasir Uddin Bulbul, who is a local correspondent of a national news daily in Gazipur noted: "Houses getting built non-stop; does not provide proper safety tanks; all the contaminated liquid waste is discharged directly into the drain and finally drained down to the river." Water quality reportedly has fallen sharply. "Earlier, when fatigued, after drinking the water, my body would have felt cool and relaxed. And the water that I drink now, I don't understand whether it is water or kerosene," said Mr. Niloy, who is a community member from Kunia Moddho para of Tongi.

### Air pollution

Air pollution is one of the main environmental concerns in the living place. Air pollution is one of the worst in Tongi's industrial areas. Reports of air pollution have increased by almost 64%. 71% of the workers reported that previously air was fresh and bad, while only 26% of the workers reported that the air is now fresh and pure. 28% of the workers reported that intolerable dust in the air is a key concern, while another 18% claim that the air is seriously polluted. Mr. Jashim Uddin, who is a local coordinator at World Vision in Tongi reported that air pollution is higher at Tongi compared to Dhaka. Mentionable is that World Vision measures air quality three times a week at three different points in Tongi such as 1) Cheragh Ali, 2) College Gate and 3) Station Road. In response to another question, more than half of the workers (51%) agreed that environmental causes were the main determinant of air pollution, while another 30% said it was man-made.

Qualitative research has further established this research findings. Smoke and dust produced from various industrial production processes, including RMG and the chemical and solid wastes, are reportedly main causes for air pollution. Particularly, dust has increased significantly in the air. "I think dust has increased almost 80% in the air", says one house owner from Borabari of Tongi. Mr. Md. Shahabuddin, a local schoolteacher reported with frustrations, "as the fumes are released, it is seen in the morning that the surrounding areas become dark for some time. In other countries mill-factories run but noone can see the smoke." A group of community members from Borabari of Tongi said in an FGD, "The entire area becomes dark with ash and dust, especially at night. People suffer, get stains on their clothes, come to their homes damaged." Sanitation practices are reportedly another main cause for air pollution in some studied locations. "Many house owners have small ring toilets which are causing 50% air pollution in the locality", reports one NGO representative from Tongi. Mr. Bazlur Rashid, a land owner from Chandra of Gazipur reported, "I have rented some of my land to the Spider Group. They are just filling up the land. All the garbage including the sanitary ones are being dumped there. There is no environment for a person to walk by the side, there is always a bad smell". Few community peoples have claimed black smoke from local transports, and unplanned urbanization as two other main air pollution contributing factors. Associated with air pollution headache (21%), dizziness (14%), tiredness (20%) and breathing problems (25%) are reported as common.

### Water logging

Waterlogging is reportedly one of the biggest environmental concerns in Tongi. Almost 14% of the workers

in the survey have reported serious waterlogging in the locality. In a separate question, 33% of workers said that previously there was only insignificant waterlogging but that it had never been too serious to report. Workers have further reported drainage congestion (63%), heavy rain (24%), and environmental reasons (20%) as the main causes for waterlogging. “There are two types of floods. Man-made floods and natural floods. We do not see natural floods. Now we see man-made floods that when it rains a little bit, water collects on the roads. Water clogs the roads and the water stinks and is plagued by mosquitoes”, reported Mr. Nasir Uddin Bulbul, a local correspondent of a national news daily at Gazipur. “When it rains, especially when it is waterlogged, it is common to be late for work. One minute late means you lose your attendance bonus for that day.”, said an RMG worker in an FGD from Borabari, Tongi.

### Increased diseases

52% of workers have identified environmental reasons as a main cause for increased diseases in the community while another 28% expressing that this has an Almighty given cause. Unless close-door laboratory observation, it is difficult to establish a one-to-one correlation between diseases and the RMG production process. But, in general, it is repeatedly claimed in a couple of FGDs with community peoples and in a number of interviews with local experts and NGOs that diseases particularly mosquito borne diseases and their manifestations including death is on an ever-increasing trend in the industrial locations of Tongi and Gazipur. Md. Shahabuddin, Principal of Cambridge School and College from Aritchpur of Tongi reported, “In my school, every room has to light the coil in the morning, before the students arrive. It is too much mosquitoes now.” A group of community peoples from Pagar of Tongi reported in an FGD, “Diseases have increased compared to 5 years ago, the amount of garbage has increased, mosquitoes and mosquito infestation have increased”. Among others, dengue fever, tuberculosis, shortness of breath, headache, diarrhoea, nausea, dizziness, itching, and cramps are reported common now a days. “Even small boys and girls now have breathing problems. This is due to dusty weather, polluted air”, claimed MD. Bazlur Rashid in an FGD with community peoples from Chandra of Tongi. “If you go to the medical centers, you will see thousands of serial patients. Mostly respiratory and cold related diseases, and skin diseases are more frequent”, claimed Shariful Islam from Chandra of Gazipur.

**Table 11: Few environmental concerns and their causes**

Environmental concerns	Causes/Reasons		
	Environmental	Man made	Almighty given
Water pollution	38.1 (35)	36.3 (33)	
Air pollution	51.4 (151)	30.4 (89)	
Increased diseases	51.9 (188)		27.9 (101)
Aggregate average	47.1	22.2	9.3

### Unhealthy Living environment

About a quarter (23.6%) of the workers report that the environment around the living place is not clean and

healthy and to some extent unacceptable. 18% of the workers claimed that, despite being in a crowded urban setting, poultry and livestock farming is common in their living place. This also leads to an unhealthy environment, according to 10% of the workers.

Environmental pollution associated with garments production and businesses is reportedly one of the highest in the study locales. Nasir Uddin Bulbul who is a Senior Sub-Editor of The Bangladesh Today based in Gazipur said that until about the 80s Tongi was almost a desolate area with very few houses. It now has more than 160 garment factories and around 7 lakh people living there. Air and environmental pollution are common, both from decomposable wastes and non-perishable waste. Mr. Md. Shahbuddin who teaches at Cambridge School and College at Arichpur of Tongi reported that except the BSIC industrial areas in Tongi, the rest of the industries have grown unplanned elsewhere and there is little environmental concern and protection for these. In his own words, "It is an industrial area. But, you see, a large number of RMG workers are living here. This is the main reason for environmental damages."



#### Poor availability of fresh oxygen

Some 40% of the workers said that their living conditions were not environmentally safe, that they had inadequate ventilation arrangement (26%), that it was always dark (12%) and that it was unacceptable (2%).

#### Drain overflow regularly

Poor drainage is reported of the main environmental concerns in the research locales. Among the environmental problems caused by poor drainage, dirty (34%), overflowing (23%), discharge in natural water sources (11%), and a main source of air pollution (6%) are commonly reported. Very little rainwater overflows into the streets. Originally, rainwater was supposed to go through the canal to drains. Most of the time the drains are blocked. "During the rainy season, these roads are very problematic. The water

from the drains rises and the water piles up. The drain water rises and the water accumulates. We factory workers find it very difficult to move around,” said a group of community people in an FGD from Jhinuk Market area of Tongi. In another FGD, a group of community people from Borabari of Tongi said, “Our drains are constantly blocked with plastic bottles and they overflow onto the roads at regular intervals. We have to walk on them”. Mr. Shariful Islam of Chandra in Gazipur said in an FGD, “It is better if there is no rain in this area. If it rains a little, I can’t go out on the road”. Mr. Md. Shahabuddin, Principal of Cambridge School and College at Arichpur in Tongi of Gazipur district said, “When we pass a drain, we cover our nose with a handkerchief and then walk. The only reason for this is the water coming from the mill/factories. After polythene, it is the second biggest problem of pollution.”

### Unhealthy Sanitation Practices

Around a third (33.3%) of workers have expressed concerns regarding prevailing hygiene practices. 23% of workers told that sanitation practices are completely unhealthy. Some 18% of workers reported that the ratio of toilet to users was unacceptable. Unsustainable construction and discharge into natural water sources are two other main environmental concerns raised by workers in the survey. “Many house owners have small ring toilets, which cause 50% air pollution in the area”, said a NGO representative from Tongi.



### Non-environment friendly waste management practices

Waste is literally considered one of the main sources of carbon emissions. Secondly, if not properly managed, wastes has immense potential to harm living environment. This research shows that waste management is a major concern in both Tongi and Gazipur and there are many loopholes in this.

Environmental concerns about waste management practices are reported too frequently. Only 22% of the workers told that solid household wastes is collected, which means that in 78% cases the irregularity persisted. About 30% of the workers could not remember any pot/tank arrangement for storage of solid household wastes in their community/locality. Age of solid household waste in their community/locality.14%

of the workers said that solid household waste was dumped indiscriminately elsewhere and another 10% said that it was often dumped into natural water sources. Air pollution from rotting solid waste is often reported. Relevant to a supplementary question, 31% of workers expressed serious environmental concerns about current waste management practices, and a further 35% of workers expressed an average concern.

**Table 12: Environmental concerns in living, drainage and sanitation and waste management practices**

Status of Living Environment		Status of living place	
Status	%	Status	%
Unhealthy	22.4 (90)	Sufficient ventilation	60.0 (241)
Unacceptable	1.2 (5)	Inadequate ventilation	25.7 (103)
Can go	76.4 (307)	Unacceptable	1.9 (8)
Poultry & livestock rearing	17.5 (70)	Dark always	12.4 (50)
Total	117.5 (472)	Total	100 (402)
Status of drainage arrangement		Status of waste management	
No system	15.7 (63)	Tank/pot arrangement	69.7 (280)
Sufficient	42.0 (169)	Throw elsewhere	14.2 (57)
Dirty	34.3 (138)	Discharge in pond/canal/lake	9.7 (39)
Overflow	23.1 (93)	Collects regularly	22.4 (90)
Discharge waste in lake/canal	10.7 (43)	Pollutes air	1.5 (6)
Main source of air pollution	5.5 (22)		
Total	131 (528)	Total	117 (472)
Status of Sanitation Practices		Any concerns over prevailing WM system	
Hygienic	66.7	No concern	24.7 (100)
Unhealthy	22.9	Medium concern	35.1 (141)
Discharge into water	0.2	Serious concern	31.1 (125)
Serious environmental concern	0.5	Same as before	5.3 (21)
Too many users	18.4	Improved than before	3.8 (15)
Total	109.0 (437)	Total	100 (402)

Qualitative research has confirmed that community members including RMG workers are not aware of and responsive to their waste management behaviour. There are dustbins with certain gaps by the roadside to keep the waste. But, it is a rare practice that community people keep the garbage right in the dustbins. “It is a common practice that community people keep household waste in a polythene and throw it elsewhere in the morning”, said Mr. Jashi Uddin, a local expert. A second common practice is that many people

consciously leave the garbage outside the dustbin instead of putting it inside. A third common practice this research has found finds is to put a pile of household waste in an open space by the side of the road if the dustbin is a little far away.

Waste pickers usually collect waste materials that are kept inside the dustbins. There is a second payment based arrangement in which waste pickers collect waste from door to door. However, waste that is piled up in open spaces at roadsides or left outside bins remains unattended in most cases. This is reportedly one of the main reasons for water and air pollution and for the spreading of mosquitoes and diseases. When it rains, this roadside waste falls into the drains and the area becomes completely submerged even during light rainfall, repeatedly claimed by the community peoples in the FGDs. "There is a lot of development is going on. But, there is no improvement in waste management. Waste is being dumped elsewhere. Garbage is being dumped in the river, wasting the river water," says Nasir Uddin Bulbul, a media person from the community.

### Chemical pollution

Environment pollution from chemically mixed water is reported to be common elsewhere. A group of RMG workers at an FGD in Pagar, Tongi told that one of their colleagues lives on the other side of the Turag River. One day, as he was coming by boat, the boat caught fire while it was almost in the middle of the river. Someone was smoking a cigarette. He threw the cigarette but into the river and the river water caught fire. Since the water is fully mixed with chemicals", they continued.

### Groundwater depletion

Ground water usage through the installation of deep tube wells has reportedly increased significantly over the years. Groundwater levels are said to have dropped threefold. "Twenty years ago, it was 170-180 feet deep; now, it is 300-400 feet deep; still, water may not be available everywhere," said Mr. Iqbal Hossain, a community member from Taragachi in Tongi. Mr. Md. Shahabuddin, principal of a local school and college, said, "The water layer in Tongi area is very low, 400-450 feet is the minimum depth is required. 10 years ago, water was available at a depth of around 200-250 feet".

### Fish species extinct

Fish species in the local water sources reportedly have gone extinct totally or only a very few that exist today have turned poisonous. A group of community people from Tongi said in an FGD, "Turag water was clean then. Good quantity of fish was available. Fish caught in the Turag water was sold in the local fish market. Now there is no fish." Nasir Uddin Bulbul who is a sub-editor of a newspaper Bangladesh Today from Gazipur said, "There is a bill 'Hydrabad', the fish of this bill was eaten earlier. No more fish are found in that bill. Only a few fish that are found today are not fit to eat". Mr. Md. Shahabuddin who teaches in a local school in Gazipur, claimed, "In 1988, I caught fish in the local canal. Now not even a single fish can be found in the canal. The polluted water is going down the canal and the fish have died."

### Rapid transformation of agricultural land to industrial production purposes

This is one of the main environmental concerns expressed by different relevant stakeholders that agricultural land is increasingly transforming into industrial land. Ten years ago those lands were used for agricultural production and now there are hundreds of factories, RMG and others. All the trees have been cut. Structured housing and human settlements for industrialisation have occupied a good amount of agricultural land. “This area used to be a major agricultural land. Now slowly the area has transformed into an industrial area. Agricultural land no longer produces crops. There is no fish, there is no water in the canal, and there is no crop to grow with water. It is now overcrowded and produces and dumps huge amounts of human waste. Water pollution is a key concern. No environment rest”, said a group of people from the Borabari community in Tongi.



## **SECTION THREE**

### **Climate Change and Environmental Causes and Vulnerabilities Inside Factories**

In this section, an analysis of the climate change and environmental causes and vulnerabilities have been conducted that exist within RMG factories in Bangladesh. For this purpose, it is first identified resources use efficiency of the RMG factories based on researched data. It is then moved on to analyse the climate change issues and concerns persisted inside the RMG factories. It is especially focused on analysing the heat and hot status inside RMG factories and its impact on RMG workers, considering it as a key element of climate change manifestation. Thirdly, it has been analysed in detail the key environmental issues and concerns that the research finds inside the RMG factories. The status of liquid and solid waste management and their respective environmental concerns have been analysed separately. Finally, the status of greening transformation aspects in the RMG industry and respective financial implications have been analysed.

#### **Resources consumption efficiency**

Less consumption of resources, whether materials, energy or food, results less carbon emissions. Less accumulation of resources from the natural sources and thus less resources means less environmental degradation and less environmental pollution and contamination. Bangladesh has pledged at the Glasgow Climate Summit to reduce 22% carbon emissions by 2030. Bangladesh's RMG industry is a main target in this. The RMG sector has now around 200 "green" factories, which have been certified by the Leadership in Energy and Environmental Design (LEED). These factories have reportedly achieved a target of reducing energy consumption by 40% and water consumption by more than 30%. To understand the climate change issues within RMG factories, the research first looked at the resource consumption practices in the production processes.

Linking to climate change and environment causes, particularly nine variables have been studied to understand resource use efficiency inside factories such as 1) electricity consumption, 2) AC usage, 3) electric fan usage, 4) generator usage, 5) petroleum and diesel usage, 6) water consumption, 7) gas usage, 8) chemical usage, and 9) solar power usage. For every single variable, respondents were given four status options to choose from e.g., 1) usage/consumption increased, 2) usage/consumption remained the same, 3) usage/consumption decreased, and 4) don't know. In comparison to 3-5 years before, individual respondents determine the current status of consumption for each variable.

Except for solar power usage, for the rest of eight variables, the statuses of increased usage/consumption and same usage/consumption are collectively considered as inefficient use of resources. Only less consumption of these resources is considered as efficient use. For solar power usage, it is however studied conversely. Same and/or increased usage/consumption of solar power compared to 3-5 years before are collectively considered efficient usage while less usage/consumption is considered as inefficient usage of this resource. To determine aggregate efficiency/inefficiency it is deducted from already counted efficient

resources usage/consumption percentage the inefficient percentage portion. Secondly, it is directly deducted inefficient usage/consumption percentage from efficient usage/consumption percentage to determine aggregate increase/decrease of resources usage/consumption. Mentionable that it is consciously dropped the 'do not know' percentage portion from any of counting.

**Table 13: Resource use efficiency inside factories**

Resources	Increased	Same	Decreased	Don't know	Efficiency of usage	Increase (+)/ Decrease (-)
Electricity	78.5 (316)	14.5 (58)	3.8 (15)	3.3 (13)	-89.2%	75.2%
AC usage	10.4 (42)	89.6 (360)	-	-	-100.0%	10.4%
Electric fan usage	74.9 (301)	25.1 (101)	-	-	-100.0%	74.9%
Generator usage	53.5 (215)	13.7 (55)	28.9 (116)	3.9 (16)	-38.3%	24.6%
Petroleum/diesel	48.8 (196)	11.3 (45)	7.3 (29)	32.6 (131)	-52.8%	41.5%
Water consumption	64.8 (260)	16.1 (65)	2.8 (11)	16.3 (66)	-78.1%	62%
Gas usage	44.4 (178)	26.8 (108)	2.4 (10)	26.4 (106)	-68.8%	42%
Chemical usage	12.7 (51)	25.6 (103)	6.1 (25)	55.6 (224)	-32.2%	6.6%
Solar power	14.7 (59)	17.5 (70)	9.0 (36)	58.8 (236)	23.2	5.7%
Mean/Aggregate average	45.3	17.9	8.6	28.1	-59.6	38.1%

The research analysis suggests that the current status of resource consumption in the RMG factories is inefficient. Aggregate average inefficient use of the studied resources is calculated at 60%. AC and electric fan usage (-100%) are individually rated as the most inefficient resource use, followed by electricity consumption (-89%), water consumption (-78%), gas consumption (-69%), petroleum/diesel consumption (-53%), generator usage (38%) and chemical usage (32%). On the other hand, only solar power usage is rated efficient, at almost 23%.

Secondly, at aggregate level, resources usage/consumption in the RMG production processes has increased around 38% while the mean average increase has been around 45%. Individually, electricity consumption and electric fan usage have increased to the top, almost 75% each, in between the last five-year period. Water consumption has increased 62% which is second highest. "Previously, it was 10 lines, now it is 200

lines. Previously, there were only 10 tube lights, now it is 100 tube lights. Previously, there were only 5 fans, now it is 200 fans. There has been a volumetric increase in dyeing and washing” said a group of workers in an FGD. Petroleum/diesel (42%), gas (42%), and generator (25%) usage however have been moderate. Chemical (7%) usage and growth of green electricity (6%) consumption have been the lowest. For 18% instances, resource usage status remains the same. On the other hand, the aggregate average decrease of resources consumption has been only 9%, with a highest decrease of generator usage (29%). What is worrying is that solar power usage reportedly has decreased about 9%.

### **CC concerns inside factories**

The average number of hot days (typically falling between June and August) has increased by 26 days annually in recent decades (USAID 2015), and this number is projected to continue to rise to an additional 35.8 days per year by 2050 (World Bank, n.d. 2020). The ILO estimates that by 2030, 4.84% of working hours in Bangladesh will be lost due to heat stress (ILO 2019). This is the equivalent of 3,833,000 full-time jobs.

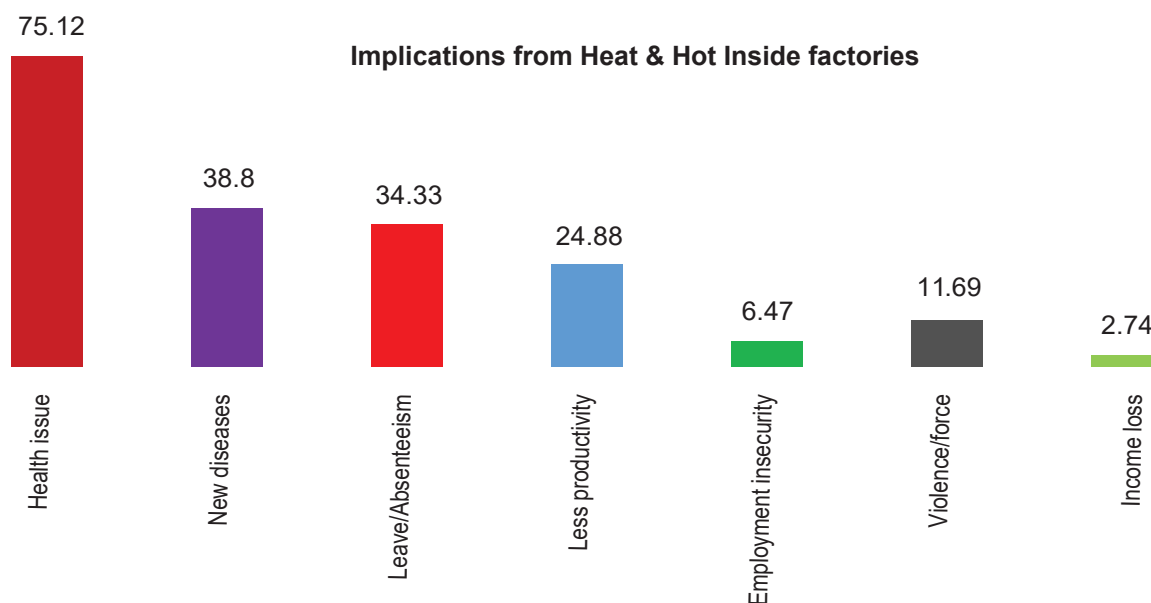
Relevant to direct climate change concerns inside factories, the status of heat and hotness and the respective implications on the work and workers have been particularly studied. Extreme heat and hotness inside factories is frequently reported. In 60% of instances, workers have reported high to extremely heat and hotness inside the factories. Around one-tenth (9%) of the workers reported that it feels like burning and/or they are all time sweating when at work. Ms. Ajmi Ara Akhter who works at Zaber & Zubair Fabrics Limited at Tongi said, “Sometimes, it is so hot that we have to pour water into the roof”. Ms. Dipa Das, an RMG worker from Pagar of Tongi said “Last year, it was so hot that we filled small polythene bags with water and hung them near the window.” Ms. Asma from Kunia moddho para of Tongi said, “We sweat and work. By the first half, with rising sun, the whole building is hot, fan and/or water nothing works. Heat stroke inside the factory is a regular phenomenon in the hot days”. Relevant to a second question on this, some one-fifth (19%) of workers said that high to extreme heat continues for 9/10 months a year. Around half (48%) of workers reported that it continues 7/8 months a year. Another more than one-quarter (27%) claimed that high heat and hotness last for around 5/6 months a year. In many green factories, different reports are also obtained. Nearly 40% of workers said in the survey that their factories have usual heat and hotness. One green factory manager from Gazipur said, “I am based at my Dhaka office. Whenever I have an opportunity to visit my factory at Gazipur, I always try to linger my stay. It’s a really huge space, green and refreshing inside”.

Relevant to a supplementary question, more than three-fourth (75%+) of the workers have reported health vulnerability from heat and hotness inside the factories. Among health vulnerabilities, dehydration, headache, dizziness, and faintness are common effects. A second main implication is the emergence of new diseases, particularly mosquito/insect borne diseases. This was reported by 39% of the workers. More than one-third (34%) of the workers have said that heat and hotness is a main cause for them taking leave and/or remaining absent in the workplace. One-quarter (25%) of workers have reported productivity

loss from heat and hot. Some 12% of the workers relate heat and hot with their violent behaviour inside factories and in their family life. Few workers also have reported employment insecurity and income loss from extreme heat and hot.

**Table 14: Status of heat and hot inside and respective implications**

Heat and hot inside RMG factory		How long continues heat & hot	
Status	%	Status	%
Average/normal	39.9 (159)	9/10 months	19.0 (46)
High	44.0 (177)	7/8 months	47.7 (116)
Extremely high	7.7 (31)	5/6 months	27.2 (66)
Always suiting	4.5 (18)	3/4 months	4.3 (10)
Burning/boiling	4.2 (17)	1/2 months	1.8 (4)
Total	100 (402)	Total	100 (243)

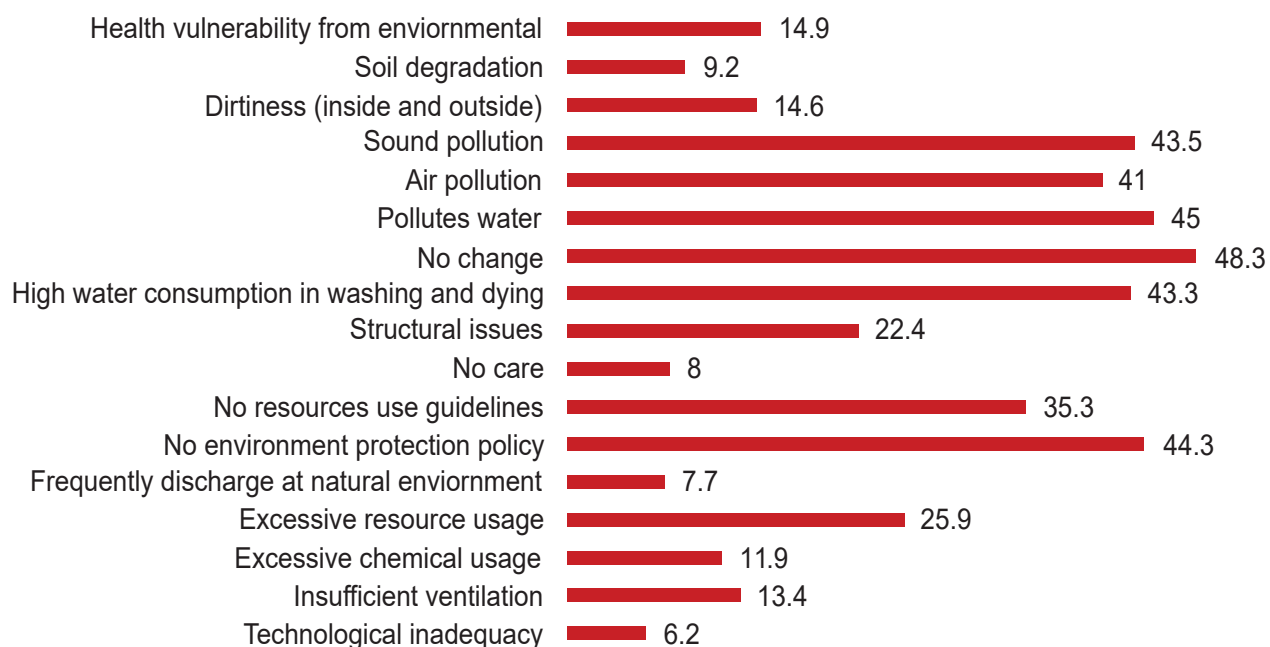


**Environmental issues and concerns inside factories**

Workers have reported a wide range of environmental issues and concerns inside factories. In addition to these concerns, legal and administrative loopholes in environmental management were also reported. Nearly half of the workers (48%) reported that environmental flaws remain the same with no change or improvement overtime. 44% of workers reported that their factories do not have an environment protection policy. More than one-third (35%) of the workers said that they do not have guidelines on resource use (water, electricity, gas, etc. ). Despite being a washing and dyeing factory, 67 workers reported that their factories do not have a water treatment plant. “There is no water recycling plant in a single factory”, said a

group of community people in an FGD from Borabari in Tongi. “I worked in about 15 factories and got ETP anywhere”, said Ms. Ambia, who is a RMG worker at TRZ garments at Chandra in Tongi. Structural flaws (22%), lack of concern for environment protection (8%) and technological inadequacies (6%) are three other legal and administrative loopholes most commonly reported by workers. One RMG owner from Misami garments limited said: “Despite the willingness and resources, we often don’t know the exact technology. If the DoE would let us know which technology to use for environmental betterment, it would have been highly benefitting to all of us”.

### Environmental issues and concerns inside factories



Apart from these legal and administrative flaws, workers also have reported a large number of valid environmental concerns inside factories. Among them, water pollution (45%), air pollution (41%), sound pollution (44%), high water consumption in washing and dyeing (43%) and excessive resources usage (26%) are reportedly the top five rated environmental concerns particularly associated with the production processes. Among other environmental concerns, dirtiness (15%), insufficient ventilation (13%), excessive chemical usage (12%), soil degradation (9%), and waste discharge to the natural environment (8%) are frequently mentioned. 15% of the workers have categorically mentioned health vulnerability from environmental causes.

Equally, workers have reported a variety of good practices inside factories to protect the environment. Nearly two-third (65%) of workers said that their factories have developed resource use guidelines. More than half of the workers (56%) claimed that their factories have formulated an environment protection policy. 22% of workers reported that there has been massive improvement in the waste management practices in the last three years. 82 workers reported that their factories have installed water treatment plants. Among

others, water pollution control (18%), sound pollution control (11%) and adoption of new technology (13%) are frequently reported. Few workers also have reported proper treatment of solid wastes (6%), rainwater harvesting (4%), and environment friendly chemical usage.

### Liquid waste management practices and respective implications

Waste management practices in the RMG factories have been separately studied. Wastes, particularly liquid wastes, are considered one of the main sources of environmental pollution. In this research, wastewater and chemical wastes have been counted separately. This research finds that in 65% instances, liquid wastes are directly discharged in the local drains and in another 8% instances they are directly discharged into the natural water system like rivers, lakes and ponds. Only in 8% instances liquid wastes are reportedly treated properly in the ETP inside factories before discharging into the natural water sources. 20% of workers are completely unaware of liquid waste management practices.

**Table 15: Liquid waste management & respective environmental & health implications**

Where discharge liquid wastes			
Where discharge	Waste water	Chemical wastes	Mean
Local drain	78.9 (317)	50.7 (204)	64.8
Treated in the treatment plant	6.2 (25)	9.2 (37)	7.7
River/Lake/pond	9.5 (38)	5.9 (24)	7.7
Don't know	5.5 (22)	34.1 (137)	19.8
<b>Total</b>	<b>100 (402)</b>	<b>100 (402)</b>	<b>100.0</b>
Environmental implications from discharges			
Unhealthy outside	26.6 (101)	31.3 (83)	28.95
Water pollution	40.3 (153)	24.9 (66)	32.6
Bad smell/Air pollution	29.7 (113)	13.2 (35)	21.45
Don't know	7.9 (30)	45.7 (121)	26.8
Health implications from chemical wastes			
<b>Health implications</b>			<b>%</b>
More mosquito/insects			40.38
More sickness			48.68
Absenteeism			7.55
Don't know			32.08
Total			128.7 (265)

Of those who are aware of liquid waste management practices, 83% addressing a further supplementary

question report serious environmental implications from disorderly liquid waste disposal. Unhealthy outside (29%), water pollution (33%), & air pollution (22%) are three main environmental causes reported from faulty liquid waste management practices.

### **Non-environment friendly Chemical waste management**

In a RMG factory, which has a dyeing and washing unit, reportedly, more than two hundred (200) chemicals are commonly in use. Broadly, these chemicals fall into four categories such as 1) colours, 2) auxiliary chemicals, 3) basic chemicals, and 4) chemicals for printing. To ensure colour durability, auxiliary chemicals are used. Basic chemicals like soda and salt are a must for washing and dyeing. Roughly sixty (60) colours, forty (40) auxiliary chemicals, ten (10) basic chemicals and another hundred (100) printing chemicals are used randomly, claimed a chemical specialist RMG manager.

For usage, chemicals are mixed with water, which becomes contaminated colored-water. Most of the chemicals are carcinogenic, that is, if they are in long-term contact, some complex diseases may create such as cancer, disability and loss of productivity. They are equally harmful to the environment. ZDHC1 (Zero Discharger of Hazardous Chemicals) has identified a group of 25+ chemicals as seriously harmful to human health and the environment. It is prescribed that these groups of chemicals should not be purchased and used. However, the identification of these groups of chemicals involves a complex and lengthy process. As such, only few RMG factories in Bangladesh have succeeded in the process so far, meaning that they avoid the banned chemicals. “When we buy chemicals, the producer/seller gives us safety data sheets and technical datasheets. The detail of that particular chemical is mentioned in the datasheet. You need to search the specific platform on the internet to find out what ingredients are in that chemical. It is a long process. It may take years to know that all your chemicals are ZDHC approved”, said one chemical specialist RMG Manager.

However, mostly RMG factories purchase and use chemicals without any precaution or scrutiny. Therefore, the workers also use them non-stop. Contaminated colour water is randomly discharged into the natural system through connected pipelines, which initially pollutes the water bodies, and to some extent also micro-organisms, groundwater and soil.

Establishing one to one correlation of health implications from different chemical usage involves a complex process, time consuming and expensive. In this survey, opinions from workers have been collect from their real-life experiences of the health implications from chemical waste processing and discharging into the natural environment. 40% of workers report that chemical waste discharge in the local drain is one of the main reasons for rapid mosquitoes/insects growing. Nearly half of the workers (49%) further have claimed that chemical waste is the main cause for growing sicknesses.

### **Solid wastes management and respective implications**

RMG factories in general produce a lot of solid wastes, too, which are under-reported. Among different

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1 A group of apparel and footwear brands and retailers working together to lead the industry towards zero discharge of hazardous chemicals by 2020 see at <https://www.roadmapzero.com/>

solid wastes generated, polythene waste is reported at the top. 68% of workers reported the same. 49% of workers further have reported producing huge plastic wastes. Polythene and plastic wastes particularly generated from finishing and packaging. Apart from these, 10% basic wastes are reported such as unused very tiny pieces of cloth, and threads and nylon and paper and packets.

Answering a supplementary question, 71% of workers reported that solid wastes are just sold out. A couple of RMG owners and managers further claimed in a number of interviews that once sold out it is no more a concern to them whether the residues dumped into the natural environment or not. 9% of the workers said that solid wastes are often thrown elsewhere and/or dumped into nearby natural systems. In a big waste dumping site in Tongi, huge such waste pieces of solid clothing have been observed. Only in 6% cases, solid wastes are reportedly treated properly.

**Table 16: Solid wastes and their management**

Status of solid wastes		What is done with solid wastes	
Solid wastes generated	%	Status	%
Plastic waste	48.8 (196)	Properly treated	6.0 (24)
Polythene waste	67.7 (272)	Thrown elsewhere	3.5 (14)
Others (clothes/paper & packet/ thread/nylon)	10.2 (41)	Dumped into nearby river/canal	5.5 (22)
		Just sold out	70.6 (284)
		Do not know	16.4 (66)
<b>Total</b>	<b>126.7 (509)</b>	<b>Total</b>	<b>102 (410)</b>

Apart from this, there is JHUTE (the residue clothes after cutting and use) waste. “Mostly, Jhute clothes are sold locally, this is how a small pant or a small bag is made and sold by the roadside”, said one employer. Still, there remains the last 1/2% which are either burnt or dumped into the waste disposal place. Very small pieces of waste clothes can often be found scattered elsewhere on the ground. They rot in the ground, degrade the soil to the extent where they may cause a drainage blockage.

### Greening the industry

Greening is increasingly being implemented to address environmental and climate change impacts. It is reported that around 200 RMG factories have already been transformed to green factories. This has resulted in a significant reduction in carbon emissions and resource consumption. “Overall, electricity consumption has reduced by 36%. Greenhouse gas emissions have come down from 0.84 kg to 0.57 kg”, claimed one green factory owner. In the qualitative part of the research, which is further studied where and how the greening is taking place. The research shows that there are two key aspects of greening in the RMG factories to reduce resource consumption i.e., 1) operational and maintenance aspects and 2) structural aspects. The following table provides a list of greening in a RMG factory:



**Table 17: Greening elements in the RMG factories**

Elements	Functionality and potentials for decreasing usage
Meter installation	Necessary for measuring consumption such as electricity and water. For efficient resource use planning, consumption reading is a must. "When I went for LEED, I was forced to install meters everywhere. You can control when you apply", said an owner of a green factory.
Introducing LED bulbs	Less electricity consuming still better lighting. Mostly traditional electric bulbs have been replaced with LED bulbs.
Introducing less power consuming fans	Many green factories have replaced traditional 85/100 watt consuming electric fans with 35/40 watt fans.
Servo Motor Installation	Electricity consumes only as long as the needling continues. Traditional factories use class motors which, once started consume electricity until they are switched off.
Installation of thermal-oil heating system	Particularly for dyeing and ironing, RMG factories need a lot of heat energy. Many green factories have introduced thermal oil heating systems. In a cycling process, 230/240 tempered hot oil is sent through a pipe, transferring the heat and returning to the previous place at 200 temperature, which means that in the next time it is raised only 30 of additional temperature. This has significantly reduced the burning of fossil fuel or gas and water usage.
Economizer installation	When water is heated in a boiler, it generates heat that transforms into flue gas, which is usually released into the environment. An economizer can capture this heat. The incoming cold water, known as feed water, passes through the economizer and is heated to approximately 60 degrees Celsius. The machinery requires a temperature of 67 degrees, so only an additional 7 degrees of heating is needed. Consequently, achieving the increase from 60 to 67 degrees requires only minimal burning of fossil fuels.
Installation of Condensate Recovery System.	Ironing is performed using steam, which, when it cools, condenses back into water. By employing a Condensate Recovery System, this water, captured at a temperature of 95 degrees Celsius, is redirected back to the boiler. As a result, steam can be regenerated by merely increasing the temperature by an additional 5 degrees. This process consumes less energy.
Biogas plant	Many green factories have set up biogas-plants. Biogas plants enable capturing emissions from the food waste particularly methane gas, which is then used for cooking purposes.
Solar panel	The installation solar panels is common in the green factories. Solar panels produce green energy, helping to reduce greenhouse gas emissions. "We have a 20,000 square meter rooftop. The entire roof is covered with solar panels. It generates 3.57 megawatts of electricity, which is 40% of our requirement. At noon, we export to the national grid, said a RMG employer.
Optimum standard setting for water usage	Many RMG factories have set optimum standards for water use. Water consumption has reduced significantly. "In 2017, 42 litres of water was used for a single wash, now it has come down to 28 litres. We have set our own optimum standard", said a RMG employer.

Setting air standard for workplace	It is a LEED requirement to maintain air quality at the workplace. More particularly, to maintain a standard set level of availability of oxygen and CO <sub>2</sub> at the workplace. This requires among others 1) structural adjustment, 2) exhaust fans installation, and 3) installation of pressure fan for suction. Maintaining air quality at the workplace reportedly has a production linkage. "If the carbon level is more than the standard level, it causes headache, error increases and production decreases, we tested earlier", said one RMG owner.
Effluent Treatment Plant (ETP)	ETP particularly treats the wastewater to bring it to a certain internationally set standard before realizing it to the natural environment. Along with increasing capacity of production, ETP capacity deserves an increase. Mentionable that factories having only dyeing and washing units, requires establishing the ETP.
JHUTE Fabric Processing	Few developed countries like Sweden have developed green energy-based technology to process jhute cloth into cotton and then further to process it to make new clothes. A group of Bangladeshi RMG factories recently have recently come together to explore this possibility. They are reported to be sending 10-11% of their wastage cloths to Sweden for reprocessing.

### Transforming green: Financial implications

Transforming a factory into a green factory, which reduces the desired level of carbon emissions and is environmentally friendly, requires spending a handsome amount of money. Some RMG factory owners and senior managers have confirmed that complete greening of a RMG factory costs over BDT 100 crores BDT (over USD9 million). "Just installing meters cost me Tk 40 lakh at a time, Solar system cost 27 crores, ETP cost 16 crores. There is a costs of installing servo meters, thermal oil heating system, economiser, condensate recovery system, biogas plant. There are structural costs. All in all, it cost me over 100 crores of BDT", said an ED of a green RMG factory.

Reportedly, there are a few funding sources for green transformations. Bangladesh Bank has a Green Transformation Fund. JICA has a funding arrangement with the Bangladesh Bank on this, too. The processes are, however, reportedly very difficult. "We went door to door to install solar systems, tried to raise funds in the country, tried to raise funds from abroad. Later, we made a fund arrangement, but we have to try for 2 years", said one RMG owner.

A number of employers were asked on what is the return from investing such a huge amount for greening. They have reported both tangible and intangible benefits. One/two cents more an offer price per product, and savings from efficient usage of resources (fuel, electricity, and water) are the main tangible benefits, reported most. "The price may be paying only 1 cent more. Conserving our energy and other resources shall ease our sufferings", said an owner of an RMG factory. However, intangible benefits are reportedly many in number. Better reputation, feeling of safety, influenced mindset, improved quality, and more buyers are five of the main intangible benefits from the greening. "Buyers feel safe here; it always works in the mindset, it is a good factory, it fulfils my requirement; my production line is not going idle. Behind one, another buyer is standing in a queue", said one influential RMG employer.

## SECTION FOUR

### Grievance Mechanisms in Environmental and Climate Change Causes

In the quantitative survey, every RMG worker respondent was asked twenty-eight different questions. The questions were divided into two different sets, to identify grievance mechanisms in two different locations i.e., 1) in the community, and 2) within the factory. In-depth qualitative research has been conducted to fill up the data gaps that emerged from the quantitative data analysis. Available laws and policies and the respective literature and reports on this have been carefully reviewed. All of this helps the research team to provide a robust analysis of the existing grievance mechanisms, both in the community and within factories. In this section, a precise draft of this research findings on grievance mechanisms related to environmental and climate change, both at community level and inside factories are presented.

#### Grievance mechanisms at community

The following twelve variables were mainly studied in relation to grievance mechanisms for climate change and environmental problems, especially at the community level:

1. Person/authority/institution to look after CC & environmental causes
2. Established legal standard for water consumption and usage
3. Established legal standard for power consumption and usage
4. Established legal standard for gas consumption and usage
5. Established legal standard for Poultry and domestic raring at community
6. Established legal standard for environmental pollution control
7. Established legal standard for waste disposal practices
8. Grievance/complaint reporting for CC and environmental causes
9. Workers knowledge and awareness regarding grievance/complaint reporting mechanism
10. Status of legal implementation
11. Status of accountability of the environmental authority and institutions
12. Status of monitoring practices

Individually, each respondent was asked twelve structured questions. Individual respondents choose a single answer from a pre-determined set of three answer statuses such as 1) yes, 2) no, and 3) don't know. The 'yes' answer is later analysed to determine the effective status of the grievance mechanism and the answers 'no' and 'don't know' answers are analysed together to determine the level of ineffectiveness. First, individual analysis of results for each individual variable has been made to determine the individual status of effectiveness and ineffectiveness. Finally, an aggregate analysis of the findings to determine gross effectiveness and/or gross ineffectiveness have been made.

**Table 18: Grievance mechanism at community level**

SL	Ten (10) indicators	Yes	No	Don't know
01	Is there an assigned person/authority/institution to look after CC & environmental causes at the community level?	41.6 (167)	28.1 (113)	30.3 (122)
02	Is there a legal standard set for water consumption and usage at living?	6.7 (27)	78.9 (317)	14.4 (58)
03	Is there a legal standard set for power consumption and usage at living?	9 (36)	77.8 (313)	13.2 (53)
04	Is there a legal standard set for gas consumption and usage at living?	6.7 (27)	77.4 (311)	15.9 (64)
05	Is there a legal standard set for Poultry and domestic raring at community places?	4.7 (19)	81.6 (328)	13.7 (55)
06	Is there a legal standard set for environmental pollution control at community level?	18.2 (73)	59.9 (241)	21.9 (88)
07	Is there a legal standard set for waste disposal practices?	37.8 (152)	49.3 (198)	12.9 (52)
08	Is there established a grievance/complaint reporting for CC and environmental causes at community level?	34.6 (139)	37.3 (150)	28.1 (113)
09	If there is a grievance/complaint reporting mechanism, do the workers know that?	58.3 (81)	24.5 (34)	17.2 (24)
10	What is the status of legal implementation? (Poor to very poor implementation 22.2%)	38.6 (155)	60.6 (244)	0.8 (3)
11	What about the status of accountability of the environmental authority and institutions? (Corruption 7.7%, don't care 5.9%)	0.7 (3)	51.0 (205)	48.3 (194)
12	What is status of monitoring practices? (periodic, regular and water and air quality checking)	29.9 (120)	67.9 (273)	2.2 (9)
Aggregate mean		23.9 (83/96)	57.9	18.2
Real aggregate average (Effectiveness/ineffectiveness)		20.7 (83)	79.3 (319) (100.0-20.7/402-83)	

The analysis suggests that at an aggregated level the current status of environmental and climate change grievance mechanisms at community level is on average 24% effective and 76% ineffective. However,

the real aggregated effectiveness of the existing grievance mechanisms is calculated at only 21% and as such real aggregated ineffectiveness is counted 79% (100-21). This difference between aggregated mean and real aggregated figure occurs predominantly because of the mean figure of the number of frequency counts, which was 83, as you can see from the table 18 above. 83 out of 402 respondents calculate 21% whereas 24% stand for 96. This is again because the level of awareness on grievance reporting was determined only for 139 respondents, who in a previous question (question no 8) report have a grievance reporting mechanism in place.

On the other hand, at the individual level, the statuses of grievance handling authority (42%), grievance/complaint reporting (35%), legal implementation (39%), and waste disposal related rules/regulations (38%) are comparatively better. Accountability arrangement of the respective authority and institution is analysed as the least effective.

Findings from qualitative research also have established survey findings that environmental and climate change related grievance mechanisms at community places are weak and unresponsive to community demand. First of all, there is a lack of awareness and clarity among community members regarding whom to report to and which institution to report to for environmental and climate change reasons. Community members in general reported their ignorance about environmental and climate change related laws, rules and regulations, particularly those related to efficient usage of resources and emergency preparedness and protection.

Secondly, there is a power and authority conflict between and among different local organizations. "If the water pump breaks it is not fixed within 10/15 days. There must be someone to see this. So far in Tongi I have not seen anyone doing the duty", said MR. Md. Shahabuddin, who teaches in a local school. Mr. Nasir Uddin Bulbul who is a local correspondent of a national news daily at Gazipur said, "If you go to the City Corporation, they say go to the Department of Environment. The Department of Environment says that it is an employer's responsibility. Again, there is a tussle between the City Corporation and the BSIC. As such, problems remain as it is, do not solve."

Thirdly, community members repeatedly expressed their frustration that local government is only partly responsive and that there is any accountability arrangement for them missing. "Just beside my living place, there is a dustbin for storing garbage. It causes a serious bad smell. I give money to the concerned waste pickers from City Corporation every month, but he takes only half of it. We, including house owners, requested the waste pickers several time, but no change in practice. Now, what can we do", said Ms. Asma, who is an RMG worker who lives in Borabari in Tongi.

Fourthly, whatever step is taken, the solution is uncertain. This means that only when mass gatherings create pressure, a solution is likely to be found, and this seems to be a rare practice. Individual reporting to environmental and climate change causes is taken as a waste of time. "If five people tell the commissioner or we go together, then it may come to a solution. But you tell me individually, it is of no use. We can't go together and there is no solution", said a group of community peoples from Gacha in Gazipur.

Fifthly, whatever environmental laws there are, law implementation is reportedly bizarre. No implementation, poor implementation, inappropriate and/or biased implementation, and corruption at implementation stage are, among others, few of the main reported ambiguities at community level. “There are many laws but there is no implementation. Polythene is a main culprit for the environment. Polythene was banned long ago. Polythene factories were closed down several times. Now, one goes to the market, bringing back with eight to ten polythene bags each”, said Mr. Md. Shahabuddin who is a Principal at Cambridge School and College based at Arichpur in Tongi in Gazipur.

### Grievance mechanisms during emergency

Grievance mechanisms in the emergency situation have been studied separately. Grievance mechanisms in emergency situations particularly related to three important variables such as air pollution, water pollution and water logging are studied. The findings suggest that during an environmental and/or climate change emergency community members report to the top of the local government. 40% of workers have reported the same. Two other actions taken during emergencies include a discussion among themselves (27%) and informing the elders (16%).

**Table 19: Grievance mechanisms during emergency**

What do community peoples do during CC and environmental emergencies?				
Status			%	
Do nothing			27.4 (110)	
Discuss themselves			27.4 (110)	
Report to elders			15.9 (64)	
Report to the local govt.			40.0 (161)	
Total			110.7 (445)	
Total			100	
Who cares for environmental causes	Air pollution control	Water pollution control	Waterlogging control	Aggregate average
local govt.	12.4 (50)	18.4 (74)	35.9 (144)	22.2
DoE	6.7 (27)	5.5 (22)	5.0 (20)	5.7
Employers	1.5 (6)	21.6 (87)		7.7
Community-based	2.7 (11)	1.0 (4)	24.8 (100)	9.5
None	76.6 (308)	53.5 (215)	34.3 (138)	54.8
Total	100 (402)	100 (402)	100 (402)	100.0

Relevant to a supplementary question, 22% of workers report that the local government cares the most during an environmental and/or climate change emergency. The DoE seemed to care the least about the complaints (6%). In one-tenth (10%) of the instances, community members themselves provided a solution.

It is however most encouraging that a few RMG owners are engaged in providing emergency solutions. 8% of RMG workers from the community level have reported the same. Although, some 55% instances, environmental and climate change causes reportedly remain unresolved.

### **Grievance mechanism inside factory**

In the context of environmental and climate change grievance mechanisms within factories, the following twelve variables have been primarily examined:

- 1) Person/authority/institution to look after CC & environmental causes
- 2) Established legal standard for water consumption, usage, and treatment
- 3) Established legal standard for power consumption and usage
- 4) Established legal standard for gas consumption and usage
- 5) Established legal standard for chemical consumption, usage, and treatment
- 6) Established legal standard for production-induced environmental pollution control
- 7) Status of grievance reporting and recording for CC and environmental causes
- 8) Workers knowledge and awareness regarding grievance/complaint reporting mechanism
- 9) Status of complaint reporting in the past
- 10) Status of complaint solution

Like the community level, individually every survey respondent has been asked ten structured questions. Individual respondents choose a single answer from a prior set of three answer statuses such as 1) yes, 2) no, and 3) do not know. An answer with 'yes' is considered as effective status of the grievance mechanism and the answers 'no' and 'do not know' collectively as ineffective status. Initially, an individual analysis of findings for every single variable has been made to determine the individual status of effectiveness and ineffectiveness. Finally, including all, an aggregated analysis of findings has been made, to determine gross effectiveness and/or gross ineffectiveness.

Real aggregated effectiveness of the existing environmental and climate change grievance mechanisms inside the factories is calculated at only 30%, and as such real aggregated ineffectiveness is recorded at almost 70%. However, the mean average effectiveness is calculated at 42% and the mean average ineffectiveness at 58%. This difference between real aggregated figure and mean averaged figure is particularly due to the smaller number of respondents counting for a couple of variables.

On the other hand, at individual level, the statuses of five variables such as grievance handling authority (74%), complaint reporting mechanism (50%), workers level of awareness about grievance reporting mechanism (72%), actual complaint reporting (66%) and solution obtained (76%) are analysed most effective. And the statuses of rest of the five (5) variables such as legal standard for water, power, gas, and chemical consumption, usage, and treatment and legal standard for production-induced environmental pollution control are analysed the most ineffective.

**Table 20: Grievance mechanisms inside RMG factories**

SL	Ten (10) indicators	Yes	No	Don't know
01	Is there an assigned person/authority to look after CC & environmental matters	73.6 (296)	10.5 (42)	15.9 (64)
02	Is there a legal standard set for water consumption, usage and treatment?	16.2 (65)	61.4 (247)	22.4 (90)
03	Is there a legal standard set for power consumption, usage and treatment?	15.9 (64)	58.2 (234)	25.9 (104)
04	Is there a legal standard set for gas consumption, usage and treatment?	12.4 (50)	54.0 (217)	33.4 (135)
05	Is there a legal standard set for chemical consumption, usage and treatment?	11.7 (47)	37.8 (152)	50.5 (203)
06	Is there a legal standard set for production-induced environmental pollution control at factory level?	22.4 (90)	34.8 (140)	42.8 (172)
07	Is there established a grievance/complaint reporting and recording for climate change and environmental causes?	50.0 (201)	19.9 (80)	30.1 (121)
08	If there is a grievance/complaint reporting mechanism, are the workers informed of that?	72.1 (145)	13.5 (27)	14.4 (29)
09	If there is a grievance/complaint reporting mechanism, do the workers ever report any complaint in the past?	65.6 (132)	25.9 (52)	8.5 (17)
10	If you report a complaint, what follows?	75.5 (100)	18.2 (24)	6.3 (8)
Aggregate average		41.5 (119/167)	33.4 (122/134)	25.0 (94)
Real aggregate average (Effectiveness/ineffectiveness)		29.6% (119)	70.4% (283) (100%-29.6%/402-119)	

### Brands/Buyers role in grievance handling

Brands/buyers' role in environmental and climate change protection inside factories have been separately studied. In 45% of the instances, workers reported a buyers/brands pressure to climate change and environmental causes. As for the buyer pressure, better waste management (64%), electricity use cut (42%), new technology adoption (39%), water use cut (37%), chemical waste treatment (24%), and gas use cut (10%) are reported most.



**Table 21: Brands role in grievance handling**

<b>Any pressure from Buyers/Brands</b>		<b>What are the main pressures for</b>	
Yes, average pressure	40.0 (161)	Water use cut	37.4
Yes, increased pressure	5.2 (21)	Electricity use cut	41.8
No/Do not know	54.7 (220)	Gas use cut	10.4
Total	100 (402)	Adopt new technology	39.0
		Better waste management	63.7
		Better chemical treatment	24.2

## SECTION FIVE

### Assessing Skills and Capacity of the TU Leaders Dealing with Environmental & CC Causes

Climate change and environmental causes and vulnerabilities in the life of RMG workers and inside RMG factories in Bangladesh is comparatively a novice area of research. Only a few endeavours can be found on this topic. Secondly, there is a lack of research and knowledge to understand trade union skills and capacity to deal with climate change and environmental aspects in the RMG matters. However, these are the most pressing issues now, both globally and inside countries. Considering an industrial atmosphere, to effectively address climate change and environmental aspects in the RMG matters, it is a must to engage trade unions. In this research, this gap has been challenged. Trade union capacity has been set out to assess to deal with environmental and climate change aspects in the RMG matters. It has been studied both quantitatively and qualitatively. This section narrates the research findings on trade union skills and capacity.

In the quantitative part of the research, it has been exclusively looked into the following seven variables to understand the skills and the capacity of the trade unions:

1. Current status of awareness of the general RMG workers on legal matters (Policy/law/Guidelines/ Rules/Regulations). It has been assumed a direct correlation between TU capacity and worker awareness
2. Current status of awareness of the TUs on legal matters (Policy/law/Guidelines/ Rules/Regulations)
3. Status of participation and engagement of workers and TUs in the law-making process
4. Status of participation and involvement of workers and TUs in the legal implementation aspects
5. Current status of tripartite social dialogue on RMG related CC and environment matters
6. Real role from TUs in CC and environmental matters in the RMG industry
7. Skills and capacity of the TUs to deal with CC and environmental matters in the RMG industry

402 RMG workers individually assess each of the above-mentioned variables. Answers were very much structured. Every worker has been asked to choose between two statuses 'Yes' or 'No'. Data enumerators were very critical as well as consciously offer quality time during the data collection phase to ensure to the extent possible a fair assessment of the variables. An individual analysis of variables has been made first. Then an aggregated analysis of the findings has been made. The findings to the RMG sectoral TU Federations and RMG connected national TU centres through a series of meetings and dialogues have been placed. Expert opinions and opinions from the RMG owners on TU capacity have been collected.

The research analysis suggests that at aggregated level, trade unions have on average 54% capacity gaps in dealing with environmental and climate change aspects of RMG workers community life and inside factories. On the other hand, an aggregated average strength of their current skills and capacity is analysed only 46%. The statuses of 1) skills and capacity to deal with CC and environmental matters in the RMG industry (61%), 2) TU understanding and awareness of the issues (50%, 3) status of social

dialogue practices (50%), and the 4) status of a real role by the TUs in CC and environmental matters (46%) are assessed comparatively better. Md. Mozibur Rahman who is a President of a national trade union centre said in a national dialogue, “I have participated in dozens of national and international seminars and dialogues. I have chaired too a couple of them.”

**Table 22: Assessing TU capacity**

<b>Status of TU capacity dealing with CC and environmental issues and concerns</b>	<b>Yes (Strength)</b>	<b>No (Gap)</b>
Status of workers awareness of policy/ guidelines	35.6 (143)	-64.4 (259)
Are the TU informed of policy/guidelines	50.2 (202)	-48.8 (200)
Workers/TU participation in the formulation of policy/guidelines	37.6 (151)	-62.4 (251)
Workers/TU participation in the implementation of policy/guidelines	38.3 (154)	-61.7 (248)
Status of social dialogue practices	49.8 (200)	-50.2 (202)
Role of TU in climate change and environmental matters	46.3 (186)	-53.7 (216)
Skills & capacity of TUs to deal with CC & environmental concerns	60.7 (244)	-39.3 (158)
Aggregate average	45.6	-54.4

The status of participation in legal formulation and implementation and the status of understanding and awareness of the general RMG workers are assessed comparatively as dissatisfactory. “It’s more of a technical matter. Only experts are involved. So far, we didn’t involve TU in these. But, we are learning. I am influenced, I may involve trade unions in future occasions”, said Mr. Chowdhury, who is an RMG owner.

## SECTION SIX

### Conclusion and Recommendations

Climate change and environment degradation from RMG production processes are real. They are the two most fundamental challenges ahead. The contribution of the RMG industry to climate change and environmental degradation is well documented globally. There is however a serious lack of research and knowledge nationally. To better address this, more research-based facts and figures are needed. It is needed to prepare trade unions to effectively address them at work. To better adapt to an already-caused negative situation, it is a must to widen critically climate change and environmental awareness of general workers. This research offers a miniature endeavour to this need. This was one of the first of its kind to document RMG workers' climate migrants and to gauge climate change and environmental causes and vulnerabilities of workers at their current living place and inside factories. To the extent in-depth grievance mechanisms for climate change and environmental causes both at community and inside RMG factories as well as assess critically the skills and capacity of trade unions have been studied to address them properly at work.

The following aspects would help trade unions to meaningfully act on this. In order to improve the general knowledge and awareness on climate change and environmental effects that have negative impacts, the following aspects were identified by RMGs' industry stakeholders, including the workers:

#### **Especially for Trade Unions**

- Generate workers and TU friendly appropriate knowledge and resources. Inform, educate, and equip trade unions to effectively address worker's CC and environmental issues and concerns both at living place and inside factories
- Initiate massive campaign to aware and mobilise RMG workers on climate change and environmental damage control and effective grievance mechanism
- Educate/aware yourself. Proactively engage in environmental stewardship
- Ensure proper training for workers and TUs to enhance their bargaining and negotiating skills on climate change and environmental issues in the bi-partite and tripartite processes
- Act to establish dedicated tripartite social dialogue to deal with legal matters at national level
- Act to ensure workers and TU participation in all climate change and environmental legal formulation and implementation processes like green transition processes
- Develop common TU position paper and initiate strong policy advocacy and lobby
- Act to engage meaningfully at workers' living place particularly on climate change and environmental grievance mechanisms of RMG workers.

#### **To Address Inside Factories**

- Arrange for proper heat and hotness control. Ensure proper ventilation, light, and sufficient air-cooling facilities.

- Ensure proper and rational use of chemicals. Do not pour chemicals down the drain. Control chemical odours.
- Ensure proper healthcare facilities for workers. Ensure safe drinking water for workers in the workplace.
- Reduce noise pollution. Implement advanced technology or control by using proper piping system
- Initiate to control water pollution. Stop throwing waste into rivers. Establish ETP in the factories where necessary. Ensure that ETP is functional where it is.
- Ensure effective wastes management. Dustbin should be kept in the right place. Recruit responsible people for waste management. Initiate to clean machinery regularly. Ensure a clean environment in front of the workplace. Ensure hygienic sanitation facilities in the workplace.
- Introduce smoke and dust control technology inside the factory. Introduce the use of sprinkle water to reduce dust.
- Establish strict rules and regulations. Ensure proper implementation. Ensure that everyone follows the rules. Introduce punishment for not complying with rules.
- Enhance strong monitoring systems. Ensure required staff for monitoring. Form a management team and a committee to look after environment and climate change matters. Introduce proper reporting channels. According to Md. Shahabuddin who teaches in a local school at Tongi, “It is possible to run the factory without throwing the polluted water into the drain. If only we have a real willingness. Establishing a proper authority deserves to be a first priority step”
- Ensure proper accountability for employers. Inform and educate top level management positions on environmental and climate change protection.

### **To Address at Community Level**

- Environmental and climate change awareness building of worker’s communities should be the core priority.
- Waste management infrastructure deserves improvement. Increase awareness about waste management should also be considered. Set appropriate rules and regulations for waste management. Increase the number of dustbins. Ensure that garbage is taken out everyday every day. Ensure that garbage is kept in one place. Initiate to stop throwing Polythene on the road.
- Develop the drainage system. Introduce regular drainage cleaning. Do not allow water to accumulate in the drain. Drains must be covered. Initiate bad odor odour control. Ensure required manpower for drain cleaning.
- Appropriate steps should be taken to control already polluted water and air. Initiate to spray water regularly to control dust. Initiate to control discharging of black smoke into the environment by the industries. Ban public smoking.
- Set standards, formulate rules and regulations for the use of resources such as water, electricity, and gas. Make community members aware of them.
- Take steps to eliminate waterlogging

- Take measures to kill insects and mosquitoes.
- Takes measures to control noise pollution
- Ensure healthy and hygienic sanitation systems for the communities.
- Ensure protection and prevention of heat waves. Ensure proper social reforestation on the roadside and in the communities.
- Engage employers in environmental protection in the adjacent community. Inform and involve land-owners in environmental protection. “If only the landlord pays attention whether it is clean then the environmental pollution will be reduced a lot”, said a group of community people from Tongi.
- Establish rules. Ensure strict enforcement of rules. Ensure strict monitoring. Ensure proper training for those in charge of environmental monitoring. “If we can just strictly enforce the law to regulate polythene usage, say soil pollution, say water pollution, we can protect the environment from many kinds of pollution”, said Mr. Md. Shahabuddin, a local schoolteacher from Gazipur.
- Ensure accountability of the concerned local government institutions and authorities. Educate and involve them fully. Train the concerned staff adequately.

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## ANNEX I: SURVEY SCHEDULE

### Study/Research on Assessing exposure and vulnerabilities of RMG workers to climate change and environmental impact and the role of trade unions

Bangladesh Institute of Labour Studies – BILS, Assisted by: GIZ

#### Part A: Consent

Purpose	This research wants to study the exposure and vulnerabilities of RMG workers to climate change and environmental causes.
Benefits	Your participation gives you the opportunity to share your experiences and ideas to a wider audience as a workers representative.
Confide	We will not be using your name or your factory name in any of our public sharing in such a way that may create risk to you or reputational risk to your factory. In case important we can refer you in our research in an alternative name or identity. However, if you think, you can be quoted directly in your name and factory name please let us know. 1. Yes 2. No
Voluntary	Participation in this survey is voluntary. You may refuse to participate. If, for any reason, you wish to stop the interview at any stage, you will be free to go.
Risk	<ul style="list-style-type: none"> <li>✓ If you don't know the answers to a question just say "I do not know the answer."</li> <li>✓ If you feel uncomfortable answering a question just say "I do not want to answer."</li> <li>✓ Some questions may sound confusing. If you need us to clarify the question again, just tell the enumerator.</li> <li>✓ Some questions may have more than one right answer. We will ask you to check all of the choices that apply to you.</li> <li>✓ If you have a question during the survey, please tell us. We will try to answer your question.</li> </ul>
Follow-up	After the survey you may have some questions or concerns. We will provide you with contact information and the name of a person who you can directly talk to. We shall give you only 50 taka as time compensation for participating in this survey.
Tracking	We will write your contact details including your alternative contacts so that we can track you later in any emerging need.
Consent	Do you consent to participate in the survey?                      1. Yes                      2. No

#### Part B: Credentials

Sample ID (Office shall fill up)	: .....
Name of respondents	: .....
Designation	: .....
Factory Name & Location	: .....
Category of factory	: 1 <input type="checkbox"/> Green    2 <input type="checkbox"/> Non-green
Living place	: .....
Contact phone	: .....

Interview Date, Place & Time	: .....
Signature of the Respondent	: .....
Signature of Data Enumerator	: .....

### Part C: Demographic Information

SL	Questions	Answer	Codes
3.1	Age		1 <input type="checkbox"/> <18 2 <input type="checkbox"/> 18-22 3 <input type="checkbox"/> 23-27 4 <input type="checkbox"/> 28-32 5 <input type="checkbox"/> 33-37 6 <input type="checkbox"/> 38-42 7 <input type="checkbox"/> 43-47 8 <input type="checkbox"/> 48-52 9 <input type="checkbox"/> 53 & above
3.2	Gender		1 <input type="checkbox"/> Male 2 <input type="checkbox"/> Female
3.3	Marital Status		1 <input type="checkbox"/> Single 2 <input type="checkbox"/> Married 3 <input type="checkbox"/> Divorced 4 <input type="checkbox"/> Widow/widower
3.4	Education		1 <input type="checkbox"/> Illiterate 2 <input type="checkbox"/> Can sign only 3 <input type="checkbox"/> Can read only 4 <input type="checkbox"/> I-V Class 5 <input type="checkbox"/> Primary Pass 6 <input type="checkbox"/> VI-X Class 7 <input type="checkbox"/> SSC 8 <input type="checkbox"/> HSC 9 <input type="checkbox"/> Bachelor & Above 10 <input type="checkbox"/> Madrasa education

### Part D: Village home, migration and support

SL	Questions	Answers	Codes
4.1	Where is the village home?		(Thana & Zila only)
4.2	What year did you migrate from the village?		Write actual
4.3	What was the status of migration?		1 <input type="checkbox"/> Self 2 <input type="checkbox"/> Entire family migrate 3 <input type="checkbox"/> Parents earlier migrate
4.4	(If answer is 1 or 2) What was your occupation in the village home?		1 <input type="checkbox"/> Student 2 <input type="checkbox"/> Agriculture 3 <input type="checkbox"/> Day labour 4 <input type="checkbox"/> small business 5 <input type="checkbox"/> SME 6 <input type="checkbox"/> Domestic work 7 <input type="checkbox"/> Self-employed 8 <input type="checkbox"/> Unemployed 9 <input type="checkbox"/> Other...
4.5	What was the reason for migration?		1 <input type="checkbox"/> Flood 2 <input type="checkbox"/> Drought 3 <input type="checkbox"/> Poverty 4 <input type="checkbox"/> Political 5 <input type="checkbox"/> River bank erosion 6 <input type="checkbox"/> Cyclone 7 <input type="checkbox"/> Crop failure for Climate reasons 8 <input type="checkbox"/> Increase pest attack 9 <input type="checkbox"/> Productivity loss 10 <input type="checkbox"/> Others (Specify)
4.6	Do you take any support from the village home?		1 <input type="checkbox"/> Financial support 2 <input type="checkbox"/> Food & Fish 3 <input type="checkbox"/> Family lives in village home 4 <input type="checkbox"/> Children live in village home 5 <input type="checkbox"/> Other (Specify) 6 <input type="checkbox"/> NO
4.7	If take support, any change over time?		1 <input type="checkbox"/> Increase 2 <input type="checkbox"/> decrease 3 <input type="checkbox"/> Same 4 <input type="checkbox"/> Other (specify)
4.8	(For changes) What is the reason?		1 <input type="checkbox"/> Climate reasons 2 <input type="checkbox"/> Environmental reasons 3 <input type="checkbox"/> Others
4.9	Do you give any support to the village home?		1 <input type="checkbox"/> Send money regularly 2 <input type="checkbox"/> Send money occasionally 3 <input type="checkbox"/> Food & cloth 4 <input type="checkbox"/> Health support 5 <input type="checkbox"/> Education support 6 <input type="checkbox"/> Others 7 <input type="checkbox"/> NO
4.10	If given support, any change over time?		1 <input type="checkbox"/> Increase 2 <input type="checkbox"/> decrease 3 <input type="checkbox"/> Same 4 <input type="checkbox"/> Other (specify)
4.11	(For changes) What is the reason?		1 <input type="checkbox"/> Climate reasons 2 <input type="checkbox"/> Environmental reasons 3 <input type="checkbox"/> Others
4.12	When you started working at RMG?		1 <input type="checkbox"/> Before 18 Years of age 2 <input type="checkbox"/> After 18 years of age
4.13	How long are you in the RMG job?		1 <input type="checkbox"/> 1-2Years 2 <input type="checkbox"/> 3-4Years 3 <input type="checkbox"/> 5-6Years 4 <input type="checkbox"/> 7-8Years 5 <input type="checkbox"/> 9+ Year

### Part E: Climate change and environmental understanding and knowledge

SL	Particulars	Answer	Codes
5.1	Have you ever heard of climate change?		1 <input type="checkbox"/> . Yes 2 <input type="checkbox"/> . No 3 <input type="checkbox"/> . Don't know
5.2	If yes, what you actually heard on this?		(Write actual)
5.3	Have you ever heard of environmental pollution?		1 <input type="checkbox"/> . Yes 2 <input type="checkbox"/> . No 3 <input type="checkbox"/> . Don't know
5.4	If yes, what you actually heard on this?		(Write actual)
5.5	Any change in the seasonal patterns than before?		1 <input type="checkbox"/> Extended Summer 2 <input type="checkbox"/> Reduced summer 3 <input type="checkbox"/> Extended winter 4 <input type="checkbox"/> Reduced winter 5 <input type="checkbox"/> Reduced rainy season 6 <input type="checkbox"/> More rain in winter 7 <input type="checkbox"/> More hot 8 <input type="checkbox"/> Less cold 9 <input type="checkbox"/> Fog in summer 10 <input type="checkbox"/> Others
5.6	Any change in temperature pattern?		1 <input type="checkbox"/> Less hot 2 <input type="checkbox"/> More hot 3 <input type="checkbox"/> More humid 4 <input type="checkbox"/> Less humid 5 <input type="checkbox"/> Same
5.7	Any change in wind than before?		1 <input type="checkbox"/> More speed 2 <input type="checkbox"/> Less wind 3 <input type="checkbox"/> Hot wind 4 <input type="checkbox"/> Pollution 5 <input type="checkbox"/> Others
5.8	What is the status of drought?		1 <input type="checkbox"/> More drought 2 <input type="checkbox"/> Less drought 3 <input type="checkbox"/> Same 4 <input type="checkbox"/> Don't know
5.9	What is the status of rainfall now?		1 <input type="checkbox"/> More rainy days 2 <input type="checkbox"/> Less rainy days 3 <input type="checkbox"/> Unseasonal rain 4 <input type="checkbox"/> Same
5.10	What is the status of heavy rainfall?		1 <input type="checkbox"/> Same 2 <input type="checkbox"/> Reduced 3 <input type="checkbox"/> Increased 4 <input type="checkbox"/> Others
5.11	If it is different than before, why?		1 <input type="checkbox"/> Climate change 2 <input type="checkbox"/> Natural 3 <input type="checkbox"/> Don't know 4 <input type="checkbox"/> Others
5.12	What is the status of cyclones/storms now?		1 <input type="checkbox"/> More 2 <input type="checkbox"/> Less 3 <input type="checkbox"/> Severe 4 <input type="checkbox"/> Light 5 <input type="checkbox"/> Same 6 <input type="checkbox"/> Others
5.13	What is the current status of flooding?		1 <input type="checkbox"/> More 2 <input type="checkbox"/> Less 3 <input type="checkbox"/> Severe 4 <input type="checkbox"/> Light 5 <input type="checkbox"/> Same 6 <input type="checkbox"/> Others
5.14	What is the status of heat and hot?		1 <input type="checkbox"/> Same 2 <input type="checkbox"/> Reduced 3 <input type="checkbox"/> Increased 4 <input type="checkbox"/> More hot days a year 5 <input type="checkbox"/> Prolonged summer 6 <input type="checkbox"/> reduced winter 7 <input type="checkbox"/> Day-night equal 8 <input type="checkbox"/> Oth
5.15	What is the reason?		1 <input type="checkbox"/> Climate change 2 <input type="checkbox"/> Environmental reason 3 <input type="checkbox"/> Natural 4 <input type="checkbox"/> Almighty given 5 <input type="checkbox"/> Sin 6 <input type="checkbox"/> Others
5.16	What is the status of water quality?		1 <input type="checkbox"/> Fresh & pure 2 <input type="checkbox"/> Average 3 <input type="checkbox"/> slightly polluted 4 <input type="checkbox"/> Heavily polluted 5 <input type="checkbox"/> Others
5.17	What is the status of air quality?		1 <input type="checkbox"/> Fresh & pure 2 <input type="checkbox"/> Average 3 <input type="checkbox"/> slightly polluted 4 <input type="checkbox"/> Heavily polluted 5 <input type="checkbox"/> Others

### Part F: Climate change and environmental vulnerabilities and causes at living

SL	Particulars	Answer	Codes
6.1	How do you rate your living environment?		1 <input type="checkbox"/> Healthy 2 <input type="checkbox"/> Unhealthy 3 <input type="checkbox"/> Unacceptable 4 <input type="checkbox"/> Acceptable
6.2	How do you rate ventilation in living places?		1 <input type="checkbox"/> Sufficient 2 <input type="checkbox"/> Little 3 <input type="checkbox"/> Unacceptable 4 <input type="checkbox"/> Dark always
6.3	What is the source of water?		1 <input type="checkbox"/> Supply water 2 <input type="checkbox"/> Tube-well 3 <input type="checkbox"/> Lake/Pond 4 <input type="checkbox"/> Canal/river
6.4	How many liters of water per worker family needs per day? (Approximately)		1 <input type="checkbox"/> 5 liter 2 <input type="checkbox"/> 10 liters 3 <input type="checkbox"/> 15 liters 4 <input type="checkbox"/> 20 liters 5 <input type="checkbox"/> 25 liters 6 <input type="checkbox"/> 30 liters & more

6.5	Any change in water usage over time?		1 <input type="checkbox"/> Same 2 <input type="checkbox"/> More consumption 3 <input type="checkbox"/> Less consumption 4 <input type="checkbox"/> reduced wastage 5 <input type="checkbox"/> Increase wastage 6 <input type="checkbox"/> Others
6.6	Any seasonal issues in water access?		1 <input type="checkbox"/> Scarce in summer 2 <input type="checkbox"/> Available in rainy season 3 <input type="checkbox"/> Scarce in winter 4 <input type="checkbox"/> Same always 5 <input type="checkbox"/> Others
6.7	What was the water quality previously?		1 <input type="checkbox"/> Fresh 2 <input type="checkbox"/> Pure 3 <input type="checkbox"/> Average 4 <input type="checkbox"/> Polluted 5 <input type="checkbox"/> Extremely polluted
6.8	What about water quality now?		1 <input type="checkbox"/> Available 2 <input type="checkbox"/> Fresh 3 <input type="checkbox"/> Polluted 4 <input type="checkbox"/> Scarce 5 <input type="checkbox"/> More costly
6.9	If it's different, why?		1 <input type="checkbox"/> Climate change 2 <input type="checkbox"/> Environmental reason 3 <input type="checkbox"/> Man-made 4 <input type="checkbox"/> Others
6.10	Any water pollution control initiative?		1 <input type="checkbox"/> Local govt. 2 <input type="checkbox"/> DoE 3 <input type="checkbox"/> Employers 4 <input type="checkbox"/> Community-based 5 <input type="checkbox"/> No
6.11	What was the air quality previously?		1 <input type="checkbox"/> Fresh 2 <input type="checkbox"/> Pure 3 <input type="checkbox"/> Average 4 <input type="checkbox"/> Polluted 5 <input type="checkbox"/> Extremely polluted
6.12	What about air quality now?		1 <input type="checkbox"/> Fresh & pure 2 <input type="checkbox"/> Polluted 3 <input type="checkbox"/> Extremely polluted 4 <input type="checkbox"/> Dust 5 <input type="checkbox"/> Others
6.13	If it's different, why?		1 <input type="checkbox"/> Climate change 2 <input type="checkbox"/> Environmental reason 3 <input type="checkbox"/> Man-made 4 <input type="checkbox"/> Others
6.14	Any health implications?		1 <input type="checkbox"/> Headache 2 <input type="checkbox"/> Dizziness 3 <input type="checkbox"/> Tiredness 4 <input type="checkbox"/> Breathing problem 5 <input type="checkbox"/> Vomiting 6 <input type="checkbox"/> Nausea 7 <input type="checkbox"/> Others
6.15	Any air pollution control initiative?		1 <input type="checkbox"/> Local govt. 2 <input type="checkbox"/> DoE 3 <input type="checkbox"/> Employers 4 <input type="checkbox"/> Community-based 5 <input type="checkbox"/> No
6.16	What is the status of electricity usage?		1 <input type="checkbox"/> Same 2 <input type="checkbox"/> Reduced 3 <input type="checkbox"/> Increased 4 <input type="checkbox"/> Others
6.17	What is the status of electric fan usage?		1 <input type="checkbox"/> More fans 2 <input type="checkbox"/> Restless 3 <input type="checkbox"/> Year-round-except winter 4 <input type="checkbox"/> Previously less fan usage 5 <input type="checkbox"/> Others
6.18	What is the status of solar power usage?		1 <input type="checkbox"/> No usage 2 <input type="checkbox"/> Same 3 <input type="checkbox"/> Increased 4 <input type="checkbox"/> Reduced 5 <input type="checkbox"/> Don't know
6.19	How do you cook food now?		1 <input type="checkbox"/> Gas burner 2 <input type="checkbox"/> Wooden stove 3 <input type="checkbox"/> Kerosene stove 4 <input type="checkbox"/> Others
6.20	How did you cook previously?		1 <input type="checkbox"/> Gas burner 2 <input type="checkbox"/> Wooden stove 3 <input type="checkbox"/> Kerosene stove 4 <input type="checkbox"/> Others
6.21	What is the status of gas consumption?		1 <input type="checkbox"/> Same 2 <input type="checkbox"/> Reduced 3 <input type="checkbox"/> Increased 4 <input type="checkbox"/> Wastage 5 <input type="checkbox"/> Others
6.22	Any issue with waterlogging?		1 <input type="checkbox"/> No waterlogging 2 <input type="checkbox"/> Average 3 <input type="checkbox"/> Serious waterlogging 4 <input type="checkbox"/> Others
6.23	Any change over time?		1 <input type="checkbox"/> Previously no waterlogging 2 <input type="checkbox"/> Little 3 <input type="checkbox"/> Same
6.24	What is the reason?		1 <input type="checkbox"/> Climate change 2 <input type="checkbox"/> Environmental reason 3 <input type="checkbox"/> Heavy rain 4 <input type="checkbox"/> Little rain 5 <input type="checkbox"/> Flood 6 <input type="checkbox"/> Drainage congestion 7 <input type="checkbox"/> Others
6.25	Any implication on workdays?		1 <input type="checkbox"/> Yes, cannot go to work 2 <input type="checkbox"/> No 3 <input type="checkbox"/> Others
6.26	Any water logging control initiative?		1 <input type="checkbox"/> Always 2 <input type="checkbox"/> sometimes 3 <input type="checkbox"/> No 4 <input type="checkbox"/> Others
6.27	Any changed health implications from excessive heat and hot?		1 <input type="checkbox"/> Same 2 <input type="checkbox"/> Boiling 3 <input type="checkbox"/> Burning 4 <input type="checkbox"/> Headache 5 <input type="checkbox"/> Tiredness 6 <input type="checkbox"/> Fainting 7 <input type="checkbox"/> Breathing problem 8 <input type="checkbox"/> Vomiting 9 <input type="checkbox"/> Nausea 10 <input type="checkbox"/> Others

6.28	Any implications on work?		1 <input type="checkbox"/> No 2 <input type="checkbox"/> Loss work day 3 <input type="checkbox"/> Capacity loss 4 <input type="checkbox"/> Reduced production
6.29	Any flooding implications on work?		1 <input type="checkbox"/> No 2 <input type="checkbox"/> Miss work day 3 <input type="checkbox"/> Price go up 4 <input type="checkbox"/> Less income 5 <input type="checkbox"/> Others
6.30	Any cyclone/storms implication on work?		1 <input type="checkbox"/> No 2 <input type="checkbox"/> Miss work day 3 <input type="checkbox"/> Price go up 4 <input type="checkbox"/> Less income 5 <input type="checkbox"/> Others
6.31	What about drainage systems?		1 <input type="checkbox"/> No system 2 <input type="checkbox"/> Sufficient 3 <input type="checkbox"/> Dirty 4 <input type="checkbox"/> Overflow 5 <input type="checkbox"/> Discharge waste in lake/canal 6 <input type="checkbox"/> Pollutes water 7 <input type="checkbox"/> Pollutes air 8 <input type="checkbox"/> Others
6.32	What is the status of waste management?		1 <input type="checkbox"/> Tank/Pot arrangement 2 <input type="checkbox"/> Throw elsewhere 3 <input type="checkbox"/> Discharge in pond/ canal 4 <input type="checkbox"/> Collects regularly 5 <input type="checkbox"/> Pollute water 6 <input type="checkbox"/> Pollute air 7 <input type="checkbox"/> Others
6.33	Any CC & environmental concerns from waste management practices?		1 <input type="checkbox"/> No concern 2 <input type="checkbox"/> Little concern 3 <input type="checkbox"/> Serious concern 4 <input type="checkbox"/> Same as before 5 <input type="checkbox"/> Improved than before 6 <input type="checkbox"/> Others
6.34	What is the status of sanitation practices?		1 <input type="checkbox"/> Hygienic 2 <input type="checkbox"/> Unhealthy 3 <input type="checkbox"/> Discharge into water 4 <input type="checkbox"/> Serious environmental concern 5 <input type="checkbox"/> Too many users 6 <input type="checkbox"/> Others
6.35	What is the status of poultry and livestock rearing in the community?		1 <input type="checkbox"/> No practice 2 <input type="checkbox"/> Common 3 <input type="checkbox"/> Little 4 <input type="checkbox"/> Others
6.36	If yes, any implications on the environment?		1 <input type="checkbox"/> No 2 <input type="checkbox"/> Little 3 <input type="checkbox"/> Serious 4 <input type="checkbox"/> Others
6.37	Any practice for rain water harvesting?		1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No 3 <input type="checkbox"/> Common 4 <input type="checkbox"/> Little
6.38	What is the trend of sickness?		1 <input type="checkbox"/> No change 2 <input type="checkbox"/> Increased 3 <input type="checkbox"/> Decreased 4 <input type="checkbox"/> New diseases now and then 5 <input type="checkbox"/> More mosquito/insects 6 <input type="checkbox"/> Others
6.39	If more, what is the reason?		1 <input type="checkbox"/> Climate change 2 <input type="checkbox"/> Environmental reason 3 <input type="checkbox"/> Almighty 4 <input type="checkbox"/> Others
6.40	Any implication on work?		1 <input type="checkbox"/> Miss work days 2 <input type="checkbox"/> Less income 3 <input type="checkbox"/> Job security 4 <input type="checkbox"/> Others
6.41	What is the status of mosquito/insect/pest attack?		1 <input type="checkbox"/> Same as before 2 <input type="checkbox"/> Increased 3 <input type="checkbox"/> Significant increase 4 <input type="checkbox"/> Reduced 5 <input type="checkbox"/> Increased diseases Increased 6 <input type="checkbox"/> Others

### Part G: Climate change and environmental practices and protection at factories

SL	Particulars	Answer	Codes
7.1	Is the factory structure environment friendly?		1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> Gradually improving 3 <input type="checkbox"/> No 4 <input type="checkbox"/> Less 5 <input type="checkbox"/> Others
7.2	What are the major environmental concerns at the factory?		1 <input type="checkbox"/> No environment-friendly technology 2 <input type="checkbox"/> No water treatment facility 3 <input type="checkbox"/> Insufficient ventilation 4 <input type="checkbox"/> Excessive chemical usage 5 <input type="checkbox"/> Excessive resources usage (water/electricity/gas) 6 <input type="checkbox"/> Frequently discharge natural environment 7 <input type="checkbox"/> No policy/guidelines/rules 8 <input type="checkbox"/> No care 9 <input type="checkbox"/> Others
7.3	How much electricity does your factory require a month?		1 <input type="checkbox"/> Huge 2 <input type="checkbox"/> More than average 3 <input type="checkbox"/> Average 4 <input type="checkbox"/> Less 5 <input type="checkbox"/> Others
7.4	What is the trend of electricity consumption at your factory?		1 <input type="checkbox"/> Same as before 2 <input type="checkbox"/> More than before 3 <input type="checkbox"/> Reduced consumption 4 <input type="checkbox"/> Don't know 5 <input type="checkbox"/> Others

7.5	What is the trend of generator usage?		1□ Same as before 2□ More than before 3□ Reduced consumption 4□ Don't know 5□Others
7.6	What is the trend of petroleum/diesel usage?		1□ Same as before 2□ More than before 3□ Reduced consumption 4□ Don't know 5□Others
7.7	What is the status of solar power usage?		1□ No usage 2□ Same 3□ Increased 4□ Reduced 5□ Don't know
7.8	How much water does your factory require a month?		Write actual
7.9	What is the trend of water consumption at production practices?		1□ Same as before 2□ More than before 3□ Reduced consumption 4□ Don't know 5□Others
7.10	Do your factory wash and dyes?		1□ Yes 2□ No 3□ Don't know
7.11	What is the rate of water consumption?		1□ High 2□ Average 3□ Efficient usage 4□Don't know
7.12	Where discharge the used water?		1□ Treatment plant available 2□ in the drain 3□ canal 4□ Don't know
7.13	Any environmental implications?		1□ No 2□ Unhealthy outside 3□ River water pollution 4□ Don't know
7.14	Does your factory harvest rainwater?		1□ Yes 2□ No 3□ In the process 4□Don't know
7.15	How much gas does your factory require a month?		1□ Huge 2□ More than average 3□ Average 4□ Less 5□Others
7.16	What is the trend of gas consumption at your factory?		1□ Same as before 2□ More than before 3□ Reduced consumption 4□ Don't know 5□Others
7.17	What are the different chemicals commonly used? (Write actual)		
7.18	What is the trend of chemical usage?		1□ High 2□ Average 3□ Standard 4□Efficient usage 5□Don't know
7.19	Where discharge chemical wastes?		1□ Drain 2□ Treated 3□ In the river 4□Lake/pond 5□Don't know
7.20	Any environmental implications?		1□ No 2□ Unhealthy outside 3□ Water pollution 4□ Air pollution 5□ Don't know
7.21	Any health implications to workers?		1□ No 2□ More Mosquito/insects 3□ More sickness 4□ Absenteeism 5□ Don't know 6□ Others
7.22	What are the other wastes which have environmental concerns?		1□ Huge plastic wastes 2□ Huge polythene wastes 3□ Others (Specify) 4□Don't know
7.23	How are they treated?		1□ Properly treated 2□ Thrown elsewhere 3□ Dumped into nearby river 4□Just sold out 5□ Don't know 6□ Others (Specify)
7.24	What are the major environmental concerns?		1□ Water pollution 2□ Air pollution 3□ Soil degradation 4□ Others
7.25	Any change in practices?		1□ Waste management improved 2□ New technology 3□ No change
7.26	What are the different environmental services available in the factory?		1□ Water treatment & reuse 2□ Water pollution control 3□ Improved Waste management 4□ New technology 5□Sound pollution control 6□ Environment-friendly Chemical usage 7□Others



7.27	What is the status of heat and hot inside factory		1 <input type="checkbox"/> Normal 2 <input type="checkbox"/> Average 3 <input type="checkbox"/> High 4 <input type="checkbox"/> Extreme 5 <input type="checkbox"/> Always suiting 6 <input type="checkbox"/> Burning/boiling 7 <input type="checkbox"/> Headache 8 <input type="checkbox"/> Tiredness 9 <input type="checkbox"/> Fainting 10 <input type="checkbox"/> Breathing problem 11 <input type="checkbox"/> Vomiting 12 <input type="checkbox"/> Nausea 13 <input type="checkbox"/> Others
7.28	How long does it continue?		1 <input type="checkbox"/> 9/10 months 2 <input type="checkbox"/> 7/8 months 3 <input type="checkbox"/> 5/6 months 4 <input type="checkbox"/> 3/4 months 5 <input type="checkbox"/> 1/2 M
7.29	Any change over time?		1 <input type="checkbox"/> Increased hot months/days 2 <input type="checkbox"/> Reduced hot months/days 3 <input type="checkbox"/> Same
7.30	What are the cooling practices?		1 <input type="checkbox"/> Increased A/C usage 2 <input type="checkbox"/> Increased fan usage 3 <input type="checkbox"/> Same as before
7.31	What are the implications from hot and heat?		1 <input type="checkbox"/> Health issue 2 <input type="checkbox"/> Leave/absenteeism 3 <input type="checkbox"/> Less productivity 6 <input type="checkbox"/> Employment insecurity 4 <input type="checkbox"/> Violence/force 5 <input type="checkbox"/> Income loss 6 <input type="checkbox"/> Others
7.32	Does your factory have any environment protection policy/guidelines?		1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No 3 <input type="checkbox"/> Don't know
7.33	Does the factory have any resource usage guidelines/policy?		1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No 3 <input type="checkbox"/> Don't know
7.34	Are the workers informed of them?		1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No 3 <input type="checkbox"/> Never informed 4 <input type="checkbox"/> Don't know
7.35	Are the TUs informed of them?		1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No 3 <input type="checkbox"/> Never informed 4 <input type="checkbox"/> Factory has no TU
7.36	What is the status of workers/TU participation in the policy/guideline framing processes?		1 <input type="checkbox"/> Better participation 2 <input type="checkbox"/> Few participate 3 <input type="checkbox"/> No participation 4 <input type="checkbox"/> Improving gradually
7.37	What is the status of Workers/TU participation in the implementation aspects?		1 <input type="checkbox"/> Better participation 2 <input type="checkbox"/> Few participate 3 <input type="checkbox"/> No participation 4 <input type="checkbox"/> Improving gradually
7.38	Any social dialogue practices on social and Climate Change Protection?		1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No 3 <input type="checkbox"/> Never informed 4 <input type="checkbox"/> Don't know
7.39	Is there any pressure from brands/ buyers for environment & climate change protection?		1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> Recently increase pressure 3 <input type="checkbox"/> Few buyers 4 <input type="checkbox"/> No 5 <input type="checkbox"/> Don't know
7.40	If yes, what are the main pressures for?		1 <input type="checkbox"/> Water use cut 2 <input type="checkbox"/> Electricity use cut 3 <input type="checkbox"/> Gas use cut 4 <input type="checkbox"/> Adopt new technology 5 <input type="checkbox"/> Better waste management 6 <input type="checkbox"/> Better chemical treatment 7 <input type="checkbox"/> Others

#### Part H: Role and Capacity of TUs to deal with climate change and environmental causes

SL	Particulars	Answer	Codes
8.1	What are the main environmental concerns associated with production processes?		1 <input type="checkbox"/> Water pollution 2 <input type="checkbox"/> Air pollution 3 <input type="checkbox"/> Sound pollution 4 <input type="checkbox"/> Dirty inside 5 <input type="checkbox"/> Dirty outside 6 <input type="checkbox"/> Health vulnerability 7 <input type="checkbox"/> Chemical causes 8 <input type="checkbox"/> Others
8.2	What are the main climate change related concerns at work?		1 <input type="checkbox"/> More hot days & months 2 <input type="checkbox"/> New diseases (COVID) 3 <input type="checkbox"/> New technology 4 <input type="checkbox"/> New employment 5 <input type="checkbox"/> Capacity gap 6 <input type="checkbox"/> Others
8.3	Does your factory have a trade union?		1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> Participation committee 3 <input type="checkbox"/> Workers Welfare Committee 4 <input type="checkbox"/> No

SL	Particulars	Answer	Codes
8.4	If yes, do the unions have any role in climate change/environmental protection?		1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> Sometimes 3 <input type="checkbox"/> No 4 <input type="checkbox"/> No scope 5 <input type="checkbox"/> TUs are not allowed 6 <input type="checkbox"/> No
8.5	If yes, how do you evaluate their skill and capacity on environmental and Climate Change protection?		1 <input type="checkbox"/> Good 2 <input type="checkbox"/> Can go 3 <input type="checkbox"/> Poor 4 <input type="checkbox"/> Very poor
8.6	If yes, how do you rate their knowledge/ understanding on environmental and climate change related law/regulations?		1 <input type="checkbox"/> Good 2 <input type="checkbox"/> Can go 3 <input type="checkbox"/> Poor 4 <input type="checkbox"/> Very poor
8.7	What is the trend of role practices?		1 <input type="checkbox"/> No role 2 <input type="checkbox"/> Same 3 <input type="checkbox"/> Increasing role 4 <input type="checkbox"/> Decreasing role

### Part I: Access to remedies for climate change and environmental causes & recommendations

SL	Particulars	Answer	Codes
9.1	Is there an assigned person/authority to look after climate change & environmental matters at factory?		1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No 3 <input type="checkbox"/> Don't know
9.2	If yes, what monitoring practices follow?		1 <input type="checkbox"/> Regular monitoring 2 <input type="checkbox"/> Periodic monitoring 3 <input type="checkbox"/> Environmental Impact Assessment 4 <input type="checkbox"/> No/ Poor practice 5 <input type="checkbox"/> Others (Specify)
9.3	Is there a legal standard set for water consumption, usage and treatment?		1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No 3 <input type="checkbox"/> Don't know
9.4	Is there a legal standard set for power consumption, usage and treatment?		1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No 3 <input type="checkbox"/> Don't know
9.5	Is there a legal standard set for gas consumption, usage and treatment?		1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No 3 <input type="checkbox"/> Don't know
9.6	Is there a legal standard set for chemical consumption, usage and treatment?		1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No 3 <input type="checkbox"/> Don't know
9.7	Is there a legal standard set for production-induced environmental pollution control at factory level?		1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No 3 <input type="checkbox"/> Don't know
9.8	Is there established a grievance/complaint reporting and recording for climate change and environmental causes?		1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No 3 <input type="checkbox"/> Don't know
9.9	If yes, are the workers informed?		1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No 3 <input type="checkbox"/> Sometimes 4 <input type="checkbox"/> Don't know
9.10	If yes, do the workers ever report any grievance/complaint in the past?		1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No 3 <input type="checkbox"/> Rare 4 <input type="checkbox"/> Cannot remember
9.11	If yes, what follows?		1 <input type="checkbox"/> Solved 2 <input type="checkbox"/> Overlooked 3 <input type="checkbox"/> Nothing happen 4 <input type="checkbox"/> Others
9.12	Is there an assigned person/authority/ institution to look after climate change & environmental causes at the community level?		1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No 3 <input type="checkbox"/> Don't know
9.13	If yes, who are they? (Write actual)		
9.14	If yes, what monitoring practices follow?		1 <input type="checkbox"/> Regular monitoring 2 <input type="checkbox"/> Periodic monitoring 3 <input type="checkbox"/> Air/water quality check 4 <input type="checkbox"/> No/Poor practice 5 <input type="checkbox"/> Others (Specify)

9.15	Is there a legal standard set for water consumption and usage at living?		1 <input type="checkbox"/> Yes	2 <input type="checkbox"/> No	3 <input type="checkbox"/> Don't know		
9.16	Is there a legal standard set for power consumption and usage at living?		1 <input type="checkbox"/> Yes	2 <input type="checkbox"/> No	3 <input type="checkbox"/> Don't know		
9.17	Is there a legal standard set for gas consumption and usage at living?		1 <input type="checkbox"/> Yes	2 <input type="checkbox"/> No	3 <input type="checkbox"/> Don't know		
9.18	Is there a legal standard set for Poultry and domestic raring at community places?		1 <input type="checkbox"/> Yes	2 <input type="checkbox"/> No	3 <input type="checkbox"/> Don't know		
9.19	Is there a legal standard set for environmental pollution control at community level?		1 <input type="checkbox"/> Yes	2 <input type="checkbox"/> No	3 <input type="checkbox"/> Don't know		
9.20	Is there a legal standard set for waste disposal practices?		1 <input type="checkbox"/> Yes	2 <input type="checkbox"/> No	3 <input type="checkbox"/> Don't know		
9.21	What is the status of implementation?		1 <input type="checkbox"/> Good	2 <input type="checkbox"/> Average	3 <input type="checkbox"/> Poor	4 <input type="checkbox"/> Very poor	5 <input type="checkbox"/> No implementation
9.22	Is there established a grievance/ complaint reporting for climate change and environmental causes at community level?		1 <input type="checkbox"/> Yes	2 <input type="checkbox"/> No	3 <input type="checkbox"/> Don't know		
9.23	If yes, do the workers know that?		1 <input type="checkbox"/> Yes	2 <input type="checkbox"/> No	3 <input type="checkbox"/> Don't know		
9.24	In case of any climate change and environmental emergency, what do the community people usually do?		1 <input type="checkbox"/> Do nothing	2 <input type="checkbox"/> Discuss themselves	3 <input type="checkbox"/> Report to elders	4 <input type="checkbox"/> Report to Local Govt	5 <input type="checkbox"/> Others
9.25	What follows?		1 <input type="checkbox"/> Solved	2 <input type="checkbox"/> Nothing happen	3 <input type="checkbox"/> Self-manage	4 <input type="checkbox"/> Others	
9.26	What about the accountability of the environmental authority and institutions?		1 <input type="checkbox"/> No accountability	2 <input type="checkbox"/> Unfair means	3 <input type="checkbox"/> Don't care	4 <input type="checkbox"/> Don't know	
9.27	What is your opinion/recommendation to better address climate change and environmental aspects at factory level? (Write actual)						
9.28	What is your opinion/recommendation to better address climate change and environmental aspects at community level? (Write actual)						

## ANNEX II: FGD GUIDELINES & CHECKLIST

### Focus Group Discussion (FGD) with the Community peoples

#### Guidelines

**Place:** FGD with the community peoples shall held in the primary sampling units of two (2) project locales such as 1) Tongi, and 2) Gazipur. FGD shall be administered in a suitable community location where live the RMG workers.

**Participants:** 7 to 8 participants are highly appreciated. A mixed group having equal number of RMG and non-RMG community peoples and men and women participation shall have to be encouraged. Participants having homogeneity in age and socio-economic status are preferred.

**Resource Persons:** Least, one Research Assistant shall facilitate a FGD. One Intern shall present to write the proceedings. He/she shall further perform the role of a gatekeeper.

**Recording:** The entire discussion shall have to be audio-recorded. For this, it is important that participants are informed in the beginning the purpose of the research as well as consent is taken from them for audio-recording.

**Photo:** Please ensure that 1/2 good photo is taken for every FGD as well as consent is taken for this. It is preferred to capture the photo in the middle.

**Special Instructions:** Asking a leading question is strictly prohibited. Respective facilitator shall only place the issue in front of the participants for discussion. To facilitate a lively discussion it is further suggested that the facilitator has taken appropriate steps in the beginning such as starting a discussion after listening to a song and saying by name etc. In no way can the question be asked by looking at the front of the question paper. It is suggested to take appropriate preparation well in advance.

**Duration:** An FGD shall continue maximum of fifty minutes.

## Checklists

### FGD with the Community peoples

#### 1.1 About the participants and migration

- Name, gender, age, education, occupation
- Status of migration: Status at village home; Migration year, causes and status of migration; Support taking from village home; Support-giving to village home [Exploring possible link with climate change and environmental vulnerability]

#### 1.2 Climate change and environmental concerns, causes and consequences

- Understanding and knowledge on climate change and environmental issues [Exploring from living]
- Seasonal dimension, trends, differences and implications
- Status of Flooding, cyclone and drought [Number/frequency/causes/implications]
- Status of heat, hot, and cold [Days/month/severity/causes/consequences]
- Status of rainfall [Length and severity, causes, and consequences]
- Availability, quality and status of consumption of natural resources [Water, electricity, gas, solar power, diesel/petrol/kerosene, fire wood, rain water harvesting]
- Environmental concerns, causes and consequences [Water and air related, soil/land degradation, dirty & cleanliness, waterlogging, drainage, wastes & chemical wastes management, sanitation, poultry and livestock rearing, mosquito & insects attack]
- Health concerns, causes, consequences and remedies [Diseases, frequency]

#### 1.3 Remedies to climate change and environmental causes

- Water pollution control [What, who, when, how]
- Air pollution control [What, who, when, how]
- Soil pollution/land degradation control [What, who, when, how]
- Water logging, Hot and heat, Flooding and cyclones, Heavy rainfall and cold control [What, who, when, how]
- Mosquito and disease control [What, who, when, how]
- Complaint making and accountability [Process, roles and responsibility, monitoring and supervision]
- Emergency management [Who, where, process]
- Status of policy/law/guidelines and legal standards and their implementation

#### 1.4 Expectations/Opinions/Recommendations

- Climate change related expectations/opinions/recommendations
- Environment related expectations/opinions/recommendations

## ANNEX III:

### CHECKLIST & GUIDELINES FOR OWNER INTERVIEW

#### Guidelines

- Area & Number:** Two (2) from each primary sampling unit of Tongi and Gazipur, thus a total of at least four (4) employers' interviews to be conducted.
- Mode of interview:** Both face-to-face interview and online-based interview are equally encouraged.
- Resource Person:** Lead researcher shall facilitate the employer's interview. As the lead researcher suggested from time to time, one Research Assistant shall provide with required assistance.
- Recording:** The entire interview to be audio-recorded. For this, it is a must that the employer is informed in the beginning the purpose of the research as well as consent is taken from him/her for audio-recording.
- Photo:** 1/2 good photos shall have to be taken for every interview. It is preferred to capture the photo in the middle.
- Special Instructions:** Leading/guiding question is strictly prohibited. In no way can the question be asked by looking at the front of the question paper. It is suggested to take appropriate preparation well in advance.
- Duration:** Employer interviews shall continue a maximum of 40 minutes each.

# CHECKLIST

## Interview with Employers

### 1.1 Climate change and environmental concerns in the RMG industry

- Leading contemporary climate change and environment issues
- Greening aspects in the Factory
- Resources consumption in the production practices [electricity, water, gas, generator, solar power, petroleum, diesel]
  - International and nationally set standard and real consumption
  - Past and present
- Technological up-gradation to address efficient use of resources and environmental leakage and workers skills/capacity to deal with new technology
- Waste generation and management and respective climate change and environmental concerns [Including chemical wastes]
- Environmental concerns from production practices [environmental causes and consequences, Chemical and water usage and treatment, Health concerns]
- Legal status (policy/law/rules inside factory) to address climate change and environmental aspects in the RMG production processes
  - National policy/law/rules
  - National legal requirements
  - National financing arrangement, issues and concerns
  - Policy/rules inside factory
  - Real practices
- Brands/buyers set standards/rules and pressure to protect climate change and environment in the production processes: past and present
- Status of participation of workers and unions in policy/law formulation, implementation, and monitoring matters
- Status of workers' knowledge, skills and capacity to deal with climate change and environmental protection
- Status of remedy for climate change and environmental causes [Authority, institution and processes inside factory, grievance/complaint reporting, accountability and management, emergency management, satisfaction and dissatisfactions, alternatives]
- Regarding tripartite social dialogue to address climate change and environmental aspects in the RMG matters

### 1.2 Expectations/Opinions/Recommendations

- Climate change related expectations/opinions/recommendations
- Environment related expectations/opinions/recommendations

## ANNEX IV:

### Checklist & Guidelines for Consultation with Trade Union

#### Guidelines

- Area & Number:** Consultation with trade unions shall be conducted at national level. Leaders from RMG industry specific national trade union centers shall be particularly invited.
- Participants:** 10-15 participants are highly appreciated. A mixed group of men and women NTUC leaders are preferred as participants.
- Resource Persons:** Lead researcher shall facilitate this consultation with trade union leaders. One Research Assistant shall assist in organizing and administrative matters and shall document and write the consultation transcript.
- Recording:** The entire consultation needs to be audio-recorded. For this, in the beginning, upon informing research objectives, consent is to be taken from the participants for audio-recording.
- Photo:** A couple of good photos need to be taken. It is preferred to capture the photo in the middle.
- Special Instructions:** In no way can the question be asked by looking at the front of the checklist. It is suggested to take appropriate preparation well in advance.
- Duration:** Consultation with trade unions shall continue a maximum of 3 hours.



# CHECKLIST

## Consultation with Trade Unions

### 1.1 Climate change and environmental concerns in the RMG industry

- Leading contemporary climate change and environment issues
- Greening aspects in the RMG industry
- Resources consumption in the production practices: Past and Present
- Environmental concerns from production practices [environmental causes and consequences, Chemical and water usage and treatment,]
- Technological up-gradation to address efficient use of resources and environmental leakage
- Waste generation and management and respective climate change and environmental concerns [Including chemical wastes]
- Status of financial arrangement to address climate change and environmental causes in the RMG industry and running concerns on this.
- Legal status (policy/law/rules at both country level and inside RMG industry) to address climate change and environmental aspects in the RMG production processes
- Status of participation of workers and unions in policy/law formulation, implementation, and monitoring matters
- Status of workers' knowledge, skills and capacity to deal with climate change and environmental protection
- Status of remedy for climate change and environmental causes [Authority, institution and processes both at factory and at community, grievance/complaint reporting, accountability and management, emergency management, satisfaction and dissatisfactions, alternatives]

### 1.2 Expectations/Opinions/Recommendations

- Climate change related expectations/opinions/recommendations
- Environment related expectations/opinions/recommendations

## ANNEX V

### Checklist & Guidelines for Interviewing Government Stakeholders

#### Guidelines

- Area & Number:** Having authority, influence, and prior know-how over the secondary sampling unit of 21 clusters under study, a maximum of four government representatives to be interviewed from Tongi and Gazipur.
- Participants:** Linking to secondary sampling units of twenty-one (21) clusters, potential 1-2 local government representatives and another 1-2 government officers such as concerned officer from the Department of Environment shall be particularly interviewed.
- Facilitator:** Least, one Research Assistant shall facilitate the interview. Lead researcher shall provide with strategic guidance from time to time. One Intern/Youth TU leader, as assigned, shall ensure necessary administrative and communication support.
- Recording:** The entire interview to be audio-recorded. For this, it is a must that the interviewee is informed in the beginning the purpose of the research as well as consent is taken from him/her for audio-recording.
- Photo:** 1/2 good photos shall have to be taken for every interview. It is preferred to capture the photo in the middle.
- Special Instructions:** Leading/guiding question is strictly prohibited. In no way can the question be asked by looking at the front of the question paper. It is suggested to take appropriate preparation well in advance.
- Duration:** Interview shall continue a maximum of 40 minutes each.

## Checklist

### Interview with the Government representative

#### 1.1 Climate Change and Environmental concerns, causes and consequences

- Status of climate change and environmental migrants in the locality
  - Approximate figure/percentage and locations
  - Exploring linkage with climate change and environmental causes
- Climate change concerns in the locality, causes and consequences [Exploring linkage with the RMG production processes]
  - Seasonal differences and implications
  - Status of variation in flooding, cyclone and drought, causes and implications
  - Status of variation in heat, hot, and cold [Length & severity], causes and consequences
  - Status of variation in rainfall pattern [Length and severity], causes and consequences
- Availability, quality and pattern of natural resources consumption [Water, electricity, gas, solar power, diesel/petrol/kerosene, fire wood, rain water harvesting]
  - Past and present
  - International and nationally set standard and real consumption
  - Exploring linkage with RMG production processes
- Environmental concerns in the locality [Water/air pollution, soil/land/river/canal/pond degradation, waterlogging, drainage & sanitation, Dirtiness, mosquito & insects attack]
  - Exploring linkage with the RMG industry and production processes
  - Causes and consequences
  - Past and present
- Waste generation and management in the locality and their climate change and environmental concerns [Exploring linkage with RMG wastes including chemical wastes]

#### 1.2 Climate change and environmental governance

- Legal status to address climate change and environmental causes in the locality
  - policy/law/rules
  - authority, institution and processes
- Status of financial arrangement to address CC and environmental causes in the locality.
- Status of community awareness and preparedness
- Climate change and environment friendly practices in the locality [Past and present]
  - Innovation
  - Technological solution [rain water harvesting/solar power usage]
  - Social practice [Avoidance of wastage/surface water consumption/health safety]

### **1.3 Remedies to climate change and environmental causes**

- Water pollution control [What, who, when, how]
- Air pollution control [What, who, when, how]
- Soil pollution/land degradation control [What, who, when, how]
- Water logging, hot and heat, flooding and cyclones, heavy rainfall and cold control [What, who, when, how]
- Mosquito and disease control [[What, who, when, how]
- Complaint making and accountability [Process, roles and responsibility, monitoring and supervision]
- Emergency management [Who, where, process]

### **1.4 Expectations/Opinions/Recommendations**

- Climate change related expectations/opinions/recommendations
- Environment related expectations/opinions/recommendations

## ANNEX VI

### Checklist & Guidelines for Expert/CSO-NGO Interview

#### Guidelines

- Area & Number:** Maximum 5 NGO/CSO representative/media representative/expert/ activists/academics from Tongi, Gazipur and Dhaka shall have to be interviewed.
- Participants:** Reputed and available NGO/CSO representative/media representative /expert/ activists/academics who have climate change and environment related work and prior know-how/connection over the primary sampling unit of Tongi and Gazipur.
- Resource Persons:** Least, one Research Assistant shall facilitate an interview.
- Recording:** The entire interview to be audio-recorded. For this, it is a must that the interviewee is informed in the beginning the purpose of the research as well as consent is taken from him/her for audio-recording.
- Photo:** 1/2 good photos shall have to be taken for every interview. It is preferred to capture the photo in the middle.
- Special Instructions:** Leading/guiding questions is strictly prohibited. In no way can the question be asked by looking at the front of the question paper. It is suggested to take appropriate preparation well in advance.
- Duration:** One interview shall continue a maximum of 40-45 minutes.

## Checklist

### Interview with Expert/CSO-NGO/Media Representatives

#### 1.1 Climate Change and Environmental concerns, causes and consequences

- Status of climate change and environmental migration  
[a) In the country; b) In the studied locality; c) Migrant RMG workers]
- Climate change concerns, causes and consequences  
[a) In the clothing industry; b) in the studied locality]
- Status of resources consumption.  
[a) Availability and quality (Water, electricity, gas, solar power, diesel/petrol /kerosene, fire wood, rain water harvesting); b) Resources consumption in the factory/locality (Past and present); c) International and nationally set standard and real consumption]
- Environmental concerns, causes and consequences  
[a) In the locality (water/air, soil/land/river/canal/pond, waterlogging, drainage & sanitation, dirtiness, mosquito & insects attack); b) Relevance with RMG production processes; c) Health concerns; d) Mosquito and pest attack; e) Past and present]
- Waste generation and management and their climate change and environmental concerns [a) In the clothing factory; b) in the locality]

#### 1.2 Climate change and environmental governance

- Legal status to address climate change and environmental causes in the 1) RMG industry and 2) surrounding locality  
[a) Policy/law/rules/regulations; b) Institution, authority, processes, and reporting]
- Status of financial arrangement to address CC and environmental causes  
[a) In the RMG industry; b) In the locality]
- Status of RMG workers awareness and preparedness  
[a) Factory level; b) Living place related]
- Climate change and environment friendly practices [Past and present]  
[a) Innovation; b) Technology (Bio plant/ETP/solar power); c) Social practice (Avoidance of waste/surface water consumption/health safety)]

#### 1.3 Remedies to climate change and environmental causes

- Pollution control [What, who, when, how]  
[a) Water; b) Air; c) Soil; d) Sound; e) Others]
- Climate change and environmental crises and shock management  
[Water logging, hot/heat, flooding/cyclones, heavy rainfall, severe cold, diseases]
- Complaint making and accountability  
[a) Institution & authority; b) Process; c) Follow-up; d) Accountability]
- Status of RMG workers awareness, preparedness, and participation

#### 1.4 Expectations/Opinions/Recommendations

- For the RMG workers living in the community
- For the RMG industry

## ANNEX VII

### Checklist and Guidelines for Case study collection

#### Guidelines

**Area & Number:** At least, one (1) from each of the two (2) broader primary sampling units of Tongi and Gazipur, thus a minimum of two (2) case studies shall have to be collected.

**Selection Criteria:** During survey conduction, Data Enumerators shall select more interesting and influencing cases particularly linked to climate change and environmental causes either inside factory or in the living place or a main reason for migration. One Research Assistant shall pre-assess on spot all the listed cases. Finally, 2/3 cases shall studied further in-depth.

**Administration:** Least, one Research Assistant shall collect a case study. Lead researcher shall guide Research Assistant from time to time for successful conduction of the case studies.

**Consent:** It is important that participant is informed in the beginning the purpose of the research as well as consent is taken from her/him for this.

**Audio-recording:** Please ensure that the entire discussion is audio-recorded. For this, it is important that consent is taken in the beginning for audio-recording

**Photo:** Please ensure that a couple of good photos are taken for every participant.

**Special Instructions:** Asking a leading question is strictly prohibited. The phone contact of a third party who is well connected with the participant needs to be collected.

**Duration:** Allocate time as per necessary. More than one interview is permitted.

#### Structure of analysis/writing a case study:

A combination of more than one of the following styles are preferred:

**Event analysis:** Before/after analysis of any significant event having implication on worker

**Trend analysis:** Change of the practice as a whole over time

**Process analysis:** Description of processes and the respective implications in each step

**Content analysis:** Grouping the facts/finding into a number of main contents and to make an orderly presentation of them that make sense.

**Timeline Analysis:** Breaking the entire story into a number of time spans.

# Checklist

## Case Study Collection

### A.0 Common Checklists/issues:

- Regarding the interview: Interviewee, location, interviewer, date, contact Info etc.
- Primary information about the respondent: Name, age, education, marital status, household members, and financial condition
- Working life: Name of the factory, designation, year of joining
- Living place:

### B.0 Specific Checklists/issues:

#### B.1 Issues:

- Labour codes and standards related
  - Employment, Job security & retrenchment:
  - Working hour, overtime, night duty, leave and rest
  - Forced/harassment/Discrimination
  - Gender and maternity protection
  - Occupational health and safety
  - Welfare including Promotion and training and social security
  - TU, PC, WWC & Social audit
- Wage and benefits related:
  - Now/Including OT/Excluding OT/Regularity/Irregularity/Satisfaction/ Dissatisfaction/ Expectation/ Barrier to fulfill expectation/Solution (Role from buyer/employer/gov/TU)

#### B.2 Checklists

- What? Perpetrators? Steps taken (Voice raise /Complain/Protest)? What followed? Outcome? Now?
- Perceived solution (Role for buyers/Gov/Employers and TUs)
- Value Addition (Localize wording, proverb, culture, norms, beliefs, practices associated with the issue)



## ANNEX VIII

### Transcript: RMG Owner Interview

**Mr. Masum Ahmed (Pseudo name)**

**Executive Director, XX Garments Limited**

We are here to do business. Working on the environment for a long time from 2012. We are looking at this as a business case. I need to protect the business first. We first study it as a business case. Business first, planet second. Business must be sustained. What to do with the environment, if there is no business. We are the first factory of Lead Platinum. We are the highest rated factory ever.

LEED (Leadership in Energy and Environmental Design) certification obtained in 2 categories, one is operation and maintenance and the other is structural particularly related to new buildings. There is a lot of waste, especially energy and water. When I go to the LEED, I have to be forced to behave. I will put meters everywhere. Only installing meters cost me Tk 40 lakh at one time. You can control when you apply. It will be understood how much is needed and how much is actually consumed. As soon as I installed the meter, I realized that there was a leakage somewhere. Compressed AIR. I observed that energy use is decreasing.

Non-standard meters can also be installed. But there is no audit there, regular audits are being done here. There is always a pressure, an audit of LEED will come. We spent 20 lakhs behind the meter and now have to save 40 lakhs of steam. LEED is the best structure.

20 liters of water is needed to wash 1 kg of cloth, you use 43 liters. This is the LEED standard. By going to the LEED I came to know this standard. I came into a system like this.

We are one step ahead. We assume that this requirement will come sometime. Those who couldn't foresee it, still haven't. If there are 4000 factories in Bangladesh, only 1500 factories have these things. As we visualize, the European Union may impose a tax in the future. Regulation may come. So we do them beforehand. Buyer is not paying any extra for these. The price they are giving the non-green factories, we are also getting the same price. However, we need to adopt more troublesome processes. Conserving our energy and other resources will alleviate this suffering. Moreover, buyers feel safe here since these systems are here, improved shipment, improved quality. This mindset will remain. My production line is not going idle. Behind one another buyer is standing in a queue. The price may be paying only 1 cent more. I will provide timely shipment and quality. This is his requirement. That is the tangible benefit. And the intangible benefit is that it always works on the mind, it is a good factory. If there is regulation in Europe then we are one step ahead.

I went to the LEED in 2017. The entire sector is an energy incentive. Fossil fuel burning is the main source of energy. Another major component of climate change is waste. In 2017, my electricity consumption for a single garment factory was 0.72 kilowatts. After implementing everything we saw electricity consumption

coming down to 0.5 kilowatts. About 36% less. There was energy consuming equipment where inverters could have been installed but we did not. I installed it later because of the IEED requirement. I didn't use daylight, but I do now. Power consumption is reduced. I came to LED lights by changing the conventional tube lights. I used to use an 85 watt fan, and replaced it with a 35 watt fan. From there, about 40 watts of savings are coming to each fan.

The swing machines we use, earlier we used class moto machines, once run consumes electricity until it is turned off again. Replaced with servo meter. Electricity will be consumed only as long as the needling continues. Overall electricity consumption is reduced by 36%. As a result, fossil fuel burning has also decreased. Greenhouse gas emission is coming down from 0.84 kg to 0.57 kg. We have taken some more specific steps to reduce fossil fuels. One of them is a thermal-oil heating system. We need volume of heat energy since dyeing is to be done, ironing is to be done. These works take a lot of heats. Heat consumes a lot of power. A lot of fossil fuel has to be burned. For that you have to use a boiler or any other thermal oil system. We went to an oil heating system instead of a boiler. Water consumption has decreased. Heat oil and started using it. The hot oil will go through the pipe, it will transfer the heat and will return to the previous place. A cycling process will continue. Even, the oil is not being consumed, it is returning again. I need 200 degree celsius temperature, I am sending 230/40 degree temperature oil. It releases the heat and returns at a lower temperature of 30 degrees. I need a lot of gas or oil to raise the temperature to 230/240 degrees. But I have a temperature of 200 degrees. As a result, fossil fuel consumption has been greatly reduced. Next is the Economizer. When we heat water by heating the boiler, the hot transform to the water. The matter of heating the water, we call it as flue gas, has a very high temperature. It goes directly into the environment. Economizer is the only technology that uses this heat by trapping it. The feeding water we have is cold water, we pass it through the economizer. Because of that heat, the cold water became hot, which means it became pre-heated. Finally when the boiler went to burn some fossil fuel it reached the desired temperature. Where it used to go from 30 degrees to 100 degrees, I am going from 70 degrees to 100 degrees. As a result, a lot of fossil fuel burning has been reduced. 40/60% reduced. Water is already heated to 60 degrees. A little heat is required. Machine takes 67 degrees. It is already 60 degrees. The new heat required is only 7 degrees.

Next is the Condensate Recovery System. Ironing is done using steam. When the heat is released, the steam is converted to water. Steam does not work with this water. We trap this water and send it back to the boiler. The hot water burns some fossil fuel to produce steam. At 95 degree temperature we capture. Steam is produced again only after increasing it by 5 degrees.

We have a biogas plant. About 8500 workers are employed here. A lot of food is wasted. Re-compost with bio-compost method. As a result, we capture methane gas. The emissions from the waste can be recovered and used for cooking purposes. There is a Roof-top Solar Panel, which is the biggest in Bangladesh, 3.57 megawatts of electricity is generated. There is a 20,000 square meter rooftop. The entire roof is covered in solar panels. At lunch time we export to the national grid. From there when we are needed, we again source electricity. Both import and export are done at the same rate. Now we can get 40% of the electricity

requirement from the solar system. The Sun's peak time and our peak time are the same.

In 2017, 42 liters of water was used for single wash, now it has come down to 28 liters. There is no set standard as to how much water should be consumed in a wash basin. We have created our own optimum standard. If it takes 4 washes, this is the first wash, this is the second wash, this is the third wash, and this is the fourth wash. The amount of water used earlier is excessive. Now within the optimum standard. Excess water goes to drainage, there is a pipe link. Switch on the water tap overnight for washing. There is wastage. Wastage is balanced with our savings.

LEED has set workplace air standards, what will be the level of carbon dioxide. If it is more, it will be hot. Machines have a temperature, the human body has a temperature. We maintain structural standards because we are obligated to do so for the LEED. Audit is done regularly here. CO2 level has to be maintained. Exhaust fans are required. There is a design for it. There is technical software, there is an expert. We call them. They put the device to test. A pressure fan is installed outside for suction. Also fixed the number of exhaust fans. The ILO has a standard. We worked that way. Many investments. It's tough to recover. However, production has increased. Because if the carbon level is more than the standard level, it causes headache, production decreases. Tested 7/8 years ago with experts. If the oxygen level is low in the brain, it will be wrong, it is normal.

The chemicals we use are extremely harmful to both human health and the environment. Dyes is a category, different types of colors, about 60 colors we use. After this comes the auxiliary chemicals. For dyeing, it is a must to take help from these auxiliary chemicals, such as to make the color durable as it is. There are about 40 auxiliary chemicals. Then there are some basic chemicals without which dyeing or washing is not possible, such as soda or salt. It is used to prepare the cloth. There are like 10 of them. Roughly these three categories. In total about 100/120 chemicals are used. If you count the printing ones, it will be above 200, around 250. When these chemicals are used with water, it becomes colored-water, what we call contaminated water, waste water. If I release it directly into the environment, most of the chemicals are carcinogenic, that is, if they are in long-term contact, some complex diseases like cancer are created. To the extent, this may cause disability and loss of productive capacity. There can be many such problems. A regulatory body has been developed to control this, which is globally accepted, 28C we call Zero Discharger. They mainly focus on the textile and leather sector. A group of 25+ chemicals have been identified that carry cancer or other serious risks. They published it. They want us not to purchase this group of chemicals. How do I understand When we buy, they give us some documents like safety data sheet and technical datasheet. The details of the chemical are mentioned there, what chemical, what is there, what will be used, everything is mentioned. You need to search the specific platform on the internet to find out what ingredients are in that chemical. If the search matches any band of that database with a chemical then it will show that this chemical cannot be bought. 100% of our chemicals are now JDH approved meaning no band chemicals. It took years.

We have two wet processing units. We have our own ETP plant in both. 100% removal is not possible.

However, there are government and international regulations that set a threshold/standard for releasing contaminated water into the environment. By maintaining that standard, we are sending the water to rivers and canals where there are many microorganisms. Earlier the capacity of ETP was less. As the production capacity increased, the capacity of the ETP was increased. We are satisfied that we are doing the best water treatment.

Among our other wastes, JHUTE is number 1, which is the residue of clothes after cutting and usage. Then there is plastic. Recently we have tied up with a company for Jhute fabric processing. Cotton is made from jhute cloth again, then again made the cloth. As such, we can use only 11% of the wastage cloths, the remaining 89% we sell locally. We burn it too, thus creating steam. When creating steam, clothes get recycled. In fact, making cotton or making clothes from Jhute clothe is not happening in Bangladesh. It has to be sent to Sweden. Green electricity is needed to run that plant, that amount of green electricity is not available in our country. We can't do it alone. We are doing this by creating a group to respond to EU regulations. Moreover, the fabrics which are rejected are cut again. This is how a small pant is made or a small bag is made. It is also going for human use. I am also doing this with an international organization. Otherwise, it once rotted in the ground. It rot means to degrading the soil.

New technology. The comfort level and dignity level of workers is increasing. Process automation is done. I have brought 1 machine that can do the work of 4 people. 1 would stain, 1 would sew, like this 4 workers would have been needed. There needs 1 person now. Auto is programmed into the machine. It takes very little time. In this way employment has decreased in some cases. However, total employment didn't decline. We are expanding. Employment remains the same. We have trained up some workers.

I need support. I need green energy to stop fossil fuels. Only 4.6% of the electricity that comes into the national grid, which we use, is green energy. The rest is non-green. I have a capacity to generate 3.7 MW solar energy. I can't go beyond that. That means I have a maximum 40/45% green energy of my requirement. The rest should be done at the national level which is not there.

Solar system cost 27 crores, ETP cost 16 crores, in total about 200 crores cost for entire greening. JICA had a lot of funds in Bangladesh Bank. I heard only 1% disbursed. There is money but I am not getting this since bridging is not happening. The processes are very difficult. Bangladesh Bank has Green Transformation Fund. We have consumed the most so far. We went around door to door to install solar systems, tried to raise funds in the country, tried to raise funds from abroad. Later, we made a fund arrangement, but we have to try for 2 years.

There is no trade union, but there is a 100% elected participatory committee. There is no worker participation in green transformation. Highly technical. We do brainstorming on a limited scale. However, the workers have benefited a lot. The work environment has improved. Oxygen levels are good. When we ask to consume less water or energy, it also influences less consumption at home. A culture has changed. It also has an impact on the community.

Training is being given to deal with emergency situations. Using some equipment. Suppose there is an

emergency phone on the wall to report the fire. There is pressure on safety from Bayer. 150 factories are using these things. Bangladesh has no standard. Why did we take the LEED? Had Bangladesh Standard been there, had it been forced to comply, there would have been no need to take the LEED. We used to. There is the Department of Environment, there is DIEF, there is the Department of Explosives, and there is the Directorate of Boilers. The Boiler Directorate has done a lot of good. The Expressive Department is a sham. The Department of Environment is not conducive, they are not helpful. They only come before the Eid and collect ransome.

There is a strategy. Update every year. How much water did I use this year, what amount will I use next year? We have a long-term target, how much water to save, how much energy to save. Not everyone knows. We call them only to certain training recipients. China does not adhere to international regulations. DoE only makes policy. But it does not suggest any technology. Maybe there is a policy. There are environmental protection rules. It has to be compiled. It is also said what the amount of sound will be.

Many demands from the government. We are not thieves. Why we ran factories during covid. There is a lot of negative propaganda. There is another group, I will be the owner of the garment, I will be the leader of BGME, then I will become an MP, I will become a minister. To advance as a whole. We do a lot of work for workers. We also need a lot of support. We all have to move the sector forward.

## ANNEX IX

### Transcript: FGD with Community People

#### BORABARI, TONGI

29 December 2023

#### Participants

Sl.	Name	Factory/Occupation	Residence
01	Shefali	Best Shirt	Boro Bari
02	Shahin Reza	Shahadat Blazer	Kunia Moddho Para
03	Ambia	TRZ	Chandra
04	Asma	Best Shirt	Kunia Moddho Para
05	Niloy	Local community people	Kunia Moddho Para
06	Ziaul Kabir Khokon	Local community people	Kunia Moddho Para
07	Iqbal Hosain	Local community people	Targach
08	Shariful Islam	Local community people	Chandra
09	Sahabuddin	Metrix	Chandra
10	Md. Bozlur Rashid	Local community people	Chandra

The first issue environment is that you have a garment factory here, what do you mean by climate and environment, how is the condition of your water, how is the condition of air, how is the condition of your soil, how is the condition of your back pond, how is the condition of the drain. Let us know what you see.

1st person: This area of ours used to be a major agricultural area. Now slowly the industry has become the main area. Due to the fact that it is an industrial area, the agricultural lands that are there are no longer producing crops. Our environment is slowly being destroyed due to human waste disposal due to overcrowding. Industrial waste is causing water pollution and the water with this waste, (we have a place here in Hyderabad, there is a canal there in the name of all the dirt) passes under the Hyderabad railway bridge. Even tin rice in that area is getting spoiled. Where a tin of rice is supposed to last 10 years to 20 years, tin rice is getting spoiled within 1 year / 6 months. We know this while doing a farmer association. And the canal bill has no fish. No animal is born anymore. Can't live in. And lots of stench.

And this dirt, we have a tub here. Next to this village of ours. At the head of a huge road like a mountain. This is because of polythene, human settlement, industrialization, all the garbage is here now. Thousands of tons of dirt are now here like huge mountains. This industrial waste, this dirt is ruining our crops, the direction in which this water goes, no crops are produced. Then I saw in today's newspaper that the water level in Bangladesh, especially our Dhaka Tongi area, our Gazipur region has gone below 200 feet. There is no fish,

there is no water in the canal, and there is no crop to grow with water. This region of ours may collapse at any time. Due to this industry and the water table is drawing water from below the ground. A huge vacuum is created. This is it for now and hold on to it if we talk or have any other problems like noise pollution, canal bills and a rod mill next door. There is also brick kiln smoke does not produce crops, tari does not become curries, fruits do not bloom, flowers are destroyed and people cannot move. We are affected in many ways, especially the people of this Gazipur region. We have a primary school that doesn't even fix the road. Our drains are blocked to drain the plastic bottles due to overcrowding and after a few days they overflow onto the roads. We have to walk on these. In all this, the research that the world has progressed is the only result of it. And it is because of this research that scientists have discovered something, that we who call ourselves communists have a greater role than researchers and scientists. That's what I personally think. Our research cannot be falsified, it will be beneficial for us if we discuss everything openly and tell the truth. Every industry needs to have a recycling process next to it. This is the dirty water that comes out, which is called chemicalized water that comes out of the factory, which is the most harmful to the environment. The water is recycled all over the world in another factory. Its job is only to purify the water, it will release the good water, and the waste will be collected and thrown away. But there is no water recycling plant or water treatment plant in our country even in a single factory. We need to do these things. I have nothing more to say. Fertilizers and pesticides are destroying the environment.

A woman's statement about road smoke: There is a rod factory next to Anwar Ispat. Due to its smoke, people suffer, get damaged, come to their homes, and get stains on their clothes. When the rod washes, the entire area becomes dark with ash, dust, especially at night.

A pond appears in front of the matrix. Acid is being poured there every day. The workers are dying. A baby girl died yesterday too. Again, the dirt in the drain is closed when it rains. There is no drain in Gazipur. The road is also not good.

What is the condition of ponds, canals, and rivers?

Their condition is not good at all. They are filling up. Where I work Spider Group of Trousers World Pvt. Ltd., I have rented some of my own land to them. All the garbage including the bathroom is there. There is no environment for a person to walk here, there is a bad smell. I was talking to a few other people about it, talking to management people, they were saying that it wouldn't work. So I said then I stop it. What I need to do for my house. Then they took two months from me. But even though more than a year has passed, they are still there, going on like this.

Another gentleman is my new landlord, who built a six-seven-story house with a drain through the wall site, meaning that the dirt coming down from the washroom is visible. There is no walking environment. That water is coming to the road again. We are also sitting on this to solve the problem but he did not come to the discussion. So what can be done. I said these two things, if only these two things happen, I think our road will be better.

I want to say one thing, what can I say about the outside environment in the house where I live for a long

time there is a dustbin for storing garbage. It means very bad smell. I give money to the landlord every month, he takes the garbage to clean the garbage, but he takes half of it, half doesn't take it, then the smell comes from there, the environment is ruined. The landlord is right about the scavenger. We also tell uncle. Later landlord said if they (city corporation people) don't take then what can we do.

We have here because of drugs but the environment is getting damaged. Many people are seen using drugs like ganja and various other drugs in the open because of which we have a lot of problems in traveling.

The environment here is all the same, the environment is bad from all sides, like mosquitoes, dust and city corporation, never forget...

So the brother said that mosquitoes, mosquitoes are increasing or decreasing?

Increasingly increasing. The mosquito grows more and more because of this dirt.

Is there no one to see?

There is no one to see, but there is in name. Now a call will kill the spray. This is the end.

Other people added to this: You have power you show but I have no power I will not come to my word.

What is the status of disease?

Diseases are also increasing. Even small boys and girls have breathing problems. This is due to dusty weather, polluted air.

What percentage of the dust is increasing?

I can't say the percentage, but it is increasing more than before. I think it is 80%. When it rains, you can't walk on the streets.

The city corporation is supposed to collect the garbage every day. A week is followed by fifteen days.

What is the condition of the river channel?

There is only one canal.

How many were there before?

There were many before. Before there was a big river, but now it is a house.

What is the use of water in this pond?

No no it's dirty it's absolutely toxic no pond water is used. Earlier people used to bathe with pond water. Now no one does. Now all the dirty water of Gazipur goes here. But now sometimes some children get sores and itches.

Are all the ponds the same?



Mostly 90 percent.

What do you think is causing this?

Dirt from homes, dirt from road pitch, toxic water from road gets into the pond and the water is lost.

Apart from the regular waste of the house, there are many other wastes.. where do they go?

That's what you think with the drain that's piped. And when this drain goes down, then the road goes under, then many people's houses also get water.

Where does the drain water go?

The rain actually overflows the streets. Originally intended to go to the canal, eventually went to Turage and Buriganga. For whatever reason, the drain gets jammed inside, like throwing something that doesn't feel right on the street into the drain. It gets jammed. Later called a sweeper. Cleaned for money at any cost. Takes whole day to clean. Half is not half.

Do you have any problem going to someone's house when the drain water rises on the street?

Yes, dirty water has to be washed away. They also do not allow us to sit on the machine and work. Again, the company does not give us the time to take the clothes in the mud and change them. We have to work with wet clothes in the same way.

At that time, the number of absences in your factory increases? Is it late?

Yes, one minute late does not give attendance bonus. Closes the gate. If someone falls due to water, he has no chance to go back home. Last year, a drain was made in front of Interfab. There was a hole. A gentle lady fell into that hole in our office. Then four or five people pulled him up by the hand, his house is there in Madina Mosque, he went there, his leg was cut, he read for two hours and went to the office. Then he was given leave from office.

When you read these problems, do you go to someone to get rid of them?

We have a landlord, a manager, tell them. When you tell them that you live in my house, you are telling me and five people are not telling. If five people tell the commissioner or we go then it comes to a solution. But you tell me it is of no use. Because we can't go to anyone and share this matter.

Now if the landlord manager does not cooperate with us, who else can we go to? Because we are common people.

We know that Bangladesh is a country of six seasons, are there six seasons now?

Now two seasons work. It's getting hot. I still sleep with the fan on. Poush month where the flowers are supposed to be cold, I'm still sitting in a simple genji.

What do you think is causing this?

Due to less vegetation, more buildings, due to the heat of the mill factory. Earlier there were trees, green, now they are being cut down and buildings are being cut. Now the oxygen is reduced. Winter is understood in the village but not in the city.

Well, brother, now we run the fan almost all the time, so has the electricity consumption increased or decreased?

Increased

How its grow?

It's hotter, so our electricity consumption has increased since before.

But it can also be said that we used to use 100 watt bulbs now we use 10 watt energy bulbs. In that case, electricity consumption should be reduced again?

Earlier it was seen that there was a fridge in people's house two or three houses after each other, now every house has a fridge, AC in every house. Every house has a TV. Extravagance is increasing. People are increasing. Technology is increasing. Due to this, the consumption of electricity has increased.

How was the water quality before? How is the water quality now? Earlier, there was government supply and some people were saying that the smell of water came out earlier.

1990 1995 was earlier pressure call. At that time it was 170-180 feet deep. Now it is 250 feet deep, but it is not available. The water that I drank before, after drinking the water under pressure, my body felt cold. And the water that I drink now, I don't understand whether it is water or kerosene.

Where do you get the water you drink now? Who said before that there was a pressure tap now where are you drinking water?

Submersible Ground Water Every House Submersible No Current No Water No Current There is Water.

Has the use of water increased or decreased before?

Because on hot days he actually takes two baths in one place from office. It can be seen that the tenant of some house has increased from ten people to five ten people for which the water cost has increased.

If you tell me how the waste of water has increased?

So earlier there was pressure tap only as much as needed but now as it is supply water, the wastage of water has increased because the tap is left on. Earlier it used to take a bucket of water to take a bath by squeezing the water, but now two or three buckets of water are used for bathing without the tap, but it is not difficult. About 20/25 years ago the population was very less than seven thousand people but now one lakh people live in this area. I drink half water and give half Falaya. And there is no account in the bathroom.

You talked about water pollution, the condition of drains is bad, about air pollution, you said that the waste from the pits is mixed in the air, also where there is waste from home factories, there is air pollution due to

various reasons. What kind of disease do you have?

Tuberculosis, shortness of breath, headache, diarrhoea, nausea, dizziness, itching, cramps.

Well, what is the situation of mosquitoes here?

Mosquitoes have increased, more mosquitoes than dirt.

Do you have any new diseases due to mosquitoes?

Dengue fever.

Has the number of dengue increased or decreased?

Increased a lot.

Now let's talk a little about the environment inside the factory. Where is the water in the factory like dyeing and washing or the water we use in the toilet?

Pipe line to drain, drain to canal river.

Is there a system to recycle or purify this chemical water before going to the river canal in the factory?

No no I have not seen in any factory in my working life.

There is a rule of the Ministry of Environment that in every factory, the used water must be purified and thrown out with a device called ETP. Do you know if there is any ETP system in the factory?

No, not in any factory. I worked in about 15/20 factories and got nowhere.

There is waste in your factory, for example, there is waste cloth, there is waste silt during packing or there is waste carton. What is the waste that is created?

All waste is sold. Others add - When I do jobs, go on inspectional visits (part of 15:45 seconds not understood) waste poly cartons are kept in a store room. It is not stripped randomly and sold as lorries to scrap shops. It is not dumped in any area around the factory. Expired goods should be displayed at a designated place. Because when I go to audit, I look for this place first, where they keep the goods. If a cargo is left outside or escapes into the surrounding area, the area may be damaged and the people in the vicinity may be harmed.

Where are the bottles of chemicals kept?

The chemical bottles are all kept separately and the water that is called chemical goes to an open free place.

A few days ago two people died in an accident in the Rupa Group of Chemicals. There was a blast from the chemical. After the blast, the two who were there died. Then we ran and were not allowed to reach there. This is happening in Dying, where lime is kept and salt. Different types of chemicals are kept for clothing. They are banned in Bayer. They are placed separately together under the ground and then there are two

people. When the incident happens, one of these two people is gone and sees the fire burning. When those two went to extinguish, those two were blasted. After the blast, everyone saw what happened and closed the line to that place and did not allow anyone to reach that place.

One of my questions is that he said that there was an explosion due to the chemicals two people died in our factories that the chemicals are kept in a certain place to take care of them which you said is there someone to take care of them for safety?

It is owned by the people. Think that this office is mine, I am keeping a trusted salaried man to take care of its damages, accidents.

OK, are there any people monitoring the chemicals that are there to see that these chemicals are not wasted, that there is no damage to the chemicals?

No there is no one for that. This is because poor people work there for chemicals, so if they don't want to work then they are threatened that they will be thrown out if they don't work. So what will they do? They are forced to do the work risking their lives.

I heard about the brothers in your factory, are these chemicals or garbage in a certain place, are they doing any harm to the workers, is their environment good, is there anyone to take care of them?

Women's statement: We have department people in our factory. Madam sirs come and say why join here? Why keep cartoons here? Why bottles here? When such garbage is seen, it is kept separately by those who have buoys.

Do you ever talk about the environment, climate, waste water, water consumption, waste, or do not turn on lights unnecessarily?

They meet when they get a job for the first time. And it has been seen that every morning the alarm sounds in the factory and tells everyone to keep their place clean, clean the machine, and work on time.

Well, in any of your factories, is there any other system outside of this electricity that our separate team has installed to let the outside light in, or install a large solar panel outside of the electricity, or something like that?

No there is no such system. Solar power is not used with the machine

You said that the heat is very hot, how is the condition of your factory?

Then you can't go around the factory. Now the amount of heat stroke inside the factory has increased. The heat is rising, now what should we do, we work in summer, sweat and work. If we leave the adjust fan, a little air comes in, and if we don't leave it, we get more heat. And when the sun rises, the whole building is hot, even if you leave the adjust fan, it does not work.

What kind of initiatives are taken to reduce factory heat?

The purpose of leaving just a fan is to remove the dust and heat inside the factory. The outside environment is becoming more polluted and what else. And our ceiling fan is on. Another thing is that we are developing, earlier there was a huge banyan tree in our area, when there was a storm we took shelter under the tree. As a result of the development, all the works have been cut off, the road has been cut, but the alternative system, alternative trees have not been planted. There is no shelter where a person or an animal can take shelter. As a result, the number of accidents has increased. In summer, when the road goes to the side, his eyes get foggy. Why is there no accident on this Gazipur road? The people of Gazipur are not able to live properly. And there is a reaction to this. Now we have increased breathing problems. If you go to the medical centers, you will see thousands of serial patients. Mostly respiratory and cold related diseases, and skin diseases are more frequent. Can't eat canal fish on it, all are farmed fish. And these fish come from far and wide. And due to this Gazipur area being an industrial zone, the hot heat coming from the factory makes us feel a little comfortable when we are in the factory, but when we leave the factory, it is seen that our condition is suffocating. There is no electricity, no water, no gas. Sometimes we can't even cook. Earlier there was load shedding of electricity now it is load shedding of gas as well. As a result people are forced to buy and eat unhealthy food from shops as a result many are getting sick.

Do you think that floods or rains have increased or decreased from before?

It is better if there is no rain in Barabari area. If it rains a little, I can't go out on the road.

Many disagree with this and say that it will be good for you but not good for the country and everyone. It won't be good if it doesn't rain because there are more hot days. If it rains, the crops will be good.

If there is so much water on the road, you can not go to the factory?

have to go Does not give leave. We have to go as it is. Go with wet clothes.

When it rains, is the attendance at the factory less than on other days?

is less Attendance is reduced attendance bonus is gone. 20 people less than one floor.

On rainy days, the workers cannot cook or eat again. In a hurry, many go to the factory without eating. (Many disagree with this saying that some are due to the laziness of the workers. Because they will sleep till 7 but the duty starts at 7:30. Then it will be like this. If I want, then there will be a way) Rain is God's gift as much as the sun falls on the soil. There will be heat, and if the soil cracks, this building will also crack in the heat.

When it rains the water gets jammed in the drain and the drain sinks. There is no sign of the drain here. Then he gets sick in the middle of the drain. Absence occurs. The company does not give leave. It can be seen that if there is an absence of 8-10 days due to illness then the job is lost.

## ANNEX X

### Transcript: FGD with Community People 2

Jhinu Market, Pagar, Tongi, Gazipur

30 December 2023

#### Participants

Sl.	Name	Factory/Occupation	Residence
01	Golam Mawla Mia	Hong Kong Factory	Jhinu Market
02	Selim	Immigrant	Jhinu Market
03	Md. Shahinur Rahman	RMG	Jhinu Market
04	Ms. Josna Parvin	Ansar VDP	Jhinu Market
05	Sabinatul Jannat	Noon Fashion-Operator	Jhinu Market
06	Ajmi Ara Akter	Zaber & Zubair Fabrics Limited	Jhinu Market
07	Anjuman Akter Basirun	Zaber & Zubair Fabrics Limited	Jhinu Market
08	Dipa Das	Roman Fashion	Pagar, Jhinu Market

#### Transcript

Woman 1: Financial situation is not good. Come here for work.

Woman 2: Don't come here because we don't belong here.

Man: Coming in 2010. Financial situation is not good. Come here for work

Man: I used to study and now I am coming here to work. I have been coming here for 20 years to work

Man: Father used to work in government there, now he left his job and came here in 1995. Father is here.

Woman.2: I had a child my husband got married because of me. I came to my brother's house, they told me to work in garments, so I work here coming to do

Woman 2: Good people come for river bank erosion, there are like 10% people like that. They are mostly from Comilla and Sirajganj.

Woman.2: Turag but no more Turag river. During the rainy season, these roads are very problematic. The drain water rises up and the water accumulates. We factory workers find it very difficult to move. The various chemicals in the factory are polluting the water of the river because of the bad smell which cannot be passed by the river. There were no houses then the river was clean then I used to see the river water was

clean now the houses are more and the factories are more due to which the river water is getting wasted day by day. It does not take 1 minute to cross the river, this time many factories have gone up across the river.

Woman 3: There was another river on that side and I used to see that the current rivers were clear not clear

Purusha: Climate says environment says everything is getting ruined.

Woman.3: I cleaned my neighborhood and the neighbor didn't clean for me.

The landlord should be careful about these things. The landlord should look at the surrounding environment If the landlord is careful about whether it is clean then environmental pollution is reduced a lot.

Man: It is not possible to clean the dirt alone every day, everyone should clean the dirt together should

Woman 3: I cleaned the dirt today, tomorrow the person next to me didn't clean it again

I cleaned it. It is not possible for me alone to clean the dirt of five people around the factory

All must be cleaned together, fakes did not come, so I did not clean this work

If you do, dirt accumulates and becomes more messy.

Man: Everyone has to work together

Esyar: Dine or washing work is done here. Where is that garbage dumped?

Woman 3: Filters the wastewater to separate chemicals from the water before it goes into the river Then thrown away.

Sir: Is it the same situation in all the factories that the waste water is filtered and then thrown into the river

Women.3 We cannot say that this procedure is done in the factories we work.

Chemical separation is done with ETP. Chemical separation is done with ETP.

Sir: Is the environment around your factory clean?

Women. 3 Fairly clean factories are impure and there are houses around them

Garbage disposals are quite occasionally smelly.

Woman. 3 It rains because of the rain the water rises because of the water the roads are waterlogged because the drains are low because the houses are raised the roads are low because of the water then we have to cross the water we have to go because of all the trouble our factory is closed No, we have to go.

Sir: You cross the dirty water to go to the office, go to the factory, do you go to the factory

lets in

Woman 2: There is a faucet in front of the factory, clean it and then go

Sir: If there is an accident like this when drowning, then leave is given. How many days leave will give such a situation

if

Woman. 3: Due to rain, the river fills, then our boat sinks, then we have to take leave, then we are given leave from the factory.

Woman.2: Gives one day off. What happened a boy is not coming to the factory properly for a long time I mean at 8:00 o'clock he is not coming there at 8:10 even then the sirs started meeting then after a while Chila came running and said is the boat on fire in the river why is the river on fire a boy The cigarette was thrown into the river and the river caught fire. The river is on fire because of chemicals.

Woman. 3: I told the incident of 16 years. The trees were burnt red then people came running.

Sir: What is the status of disease?

Women.1 Diseases are increasing more than before

increasing

Sir: Do you think it is still growing as it was 10 years ago?

Female 1: Many bones may not be as they were before, but are decreasing

Sir: Dexugu in the area is increasing or decreasing?

Woman.1: Dexgyu is increasing in my family of five.Many people have Dexgyu.

Sir: Why is the infestation increasing compared to 5 years ago, there is no one to see the mosquito infestation

Female.1: Compared to 5 years ago, the amount of garbage has increased, mosquito infestation has increased and mosquitoes have increased

There is no one to watch. Even giving mosquito repellent after one or two months does not work that way

Sir: Now that the winter is going on, how is the temperature inside the factory?

Man: Warm winter is going on inside and now it is hot

Sir: factory green or not green

Male: The reason for it being hot inside is because the light is hot because of the light in the water

Women.1: It is very hot during the summer

Either March or April is very hot.



Women.1: The heat lasts for two to three months.

Sir: It is so hot that you have to pour water into the roof. You stay here for two to three months

How long have you been working?

Female.1 : Been working here for 10 years

Sir: I think it was like this 10 years ago

Woman.1: It was not so hot before but we got very hot in Ramadan last year in our Pura

The body was scratched

Sir: There is no such case that no one gets sick and dizzy in this summer

Women. 1 Many people's heads have fallen off. This time it's too hot to work suddenly

Heads are spinning and houses are getting so hot that even children are getting sick. in summer

Many have died.

Woman.2: 1 Incident Last time it got very hot then we used to fill small polythene bags with water and hang them near the window but even then we could see that it did not get hot, the machine would get hot. Put on the fan. But he didn't get hot either. We asked about the AC. They didn't put the AC on. This is because the authorities are not fully aware of us.

Sir: What kind of winter does the winter seem to increase or decrease?

Women. 2 This year's winter is less. Last year there was a lot of winter. This year the intensity of winter is less

so close

Sir: Do you think winter is increasing in the last 10 years?

Female.2; Winter is increasing but the duration of winter is not increasing

Sir: Is the rainy season increasing or decreasing?

Female.2; It has rained well, the sitting situation is not understood but Mymensingh is raining well there

It happened that we did not get such a monsoon. It does not rain here in winter.

Sir: What is the condition of the fog, are the cyclones increasing or decreasing?

Woman 2: It's okay but it doesn't feel cold. Earthquakes are increasing and floods are increasing

Sir: Water consumption is increasing not decreasing

Women.2: Water consumption is increasing Water consumption per liter is increasing

Sir: Electricity consumption Electricity consumption is increasing not decreasing

Women. 2 : The use of electricity is increasing more than ever. In some cases, electricity consumption is decreasing

Electricity consumption is increasing, we don't use 100 watt lights, we use energy lights

I do

Sir: The consumption of gas is increasing or decreasing, the consumption of diesel is increasing or decreasing

can

Female.2: Usage seems to be decreasing. Gas is not available Diesel consumption is less than before gone

Sir: Sometimes there is talk about environment in the office

Female.2; There is no meeting about the environment in the factory, meeting about the rules and regulations of the factory

by doing

Sir: There is no environmental meeting in the area

Woman 2: This road will be watery because of water I could not come on time when I informed the authority they said but that is your problem if you don't come on time what will it be of use to you?

Sir: No one talks about the environment nor does anyone come forward in the area and the authorities do not talk about it.

Man: No

Sir: coming to check the air volume or river water check

Have you ever seen anything like this

Woman.2: No

Sir: So far we have talked to you about many things, now what about you?

He used to say whether he had advice

Woman 2: It would be better if there is a bridge over the river Turag. Level works should be seen by factory level people and external works should be seen by everyone. We have to work together.

Sir: Can you give us any advice?

Woman 2: Let everyone be aware of the many problems that many of our workers face

We have to say that everyone should be careful about such things.

## ANNEX XI

### Transcript: Interview with CSO/NGO Stakeholder

Md. Shahabuddin, Founder & Principle, Cambridge School and College

Jamai Bazar, Arichpur Tongi, Gazipur

First of all, I want to say about the environment in our country there are laws for many things but there is no enforcement and implementation of the laws. Polythene is the main cause of environmental pollution. Several times it was enacted that polythene factories should be closed, polythene should no longer be used in the market. We used to bring the bazaar with jute bags (as we saw when we were children, our father called tupi, our family said in Barisal language, Haji used to bring it to the market with it on his head or in a bark sack). But now he is going to the market alone, bringing eight to ten polythene bags to the market. But the government could have stopped it if it wanted. Laws are there, but laws are not enforced.

Our drains get clogged most of the time when it rains. Sticks to polythenes. If the polythenes were not there, the drain water could flow freely. The garbage of the house is filled with polythene and thrown into the drain. There is a five storied building next to my house, sometimes the garbage is covered with polythene and thrown into the drain, I can't open the window because of the stench. If we want to stop the environmental pollution then the use of this polythene should be stopped. If you can stop it, say soil pollution, say water pollution, we can protect the environment from many types of pollution.

Our industrial factory is definitely a blessing for our Bangladesh. If this mill factory was not in operation at the time, then 80 percent of the people of Bangladesh would not get rice. Look at other countries such as China and other developed countries but they do not make any factories in their own country, they impose on others. Environmental pollution should not happen to others. The Chinese will see mill factories in Malaysia, Myanmar or Bangladesh but not in their own country because they know that mill factories here will cause environmental pollution. And in some countries they are doing it by keeping the environment right. It is possible to run the factory without throwing the polluted water of our factory into the drain. If only we had proper authority. I think it is because we have to go by the nose when we have to pass by the river Turagh. When passing by a drain, hold the nose with a handkerchief and then go. The only reason for this is that the water coming from the mill factory has a great stench coming from it. I think this water from the mill factory should not come into the open water bodies. It is the second biggest issue in environmental pollution that is pollution by mill factory water.

I have seen in many places that brick kilns are usually 4-5 km away from houses or rivers. But lately I see that there is a little empty space in the middle of the settlement and there is also a brick kiln. You go to Ashulia, you go to Konabari or Kashimpur. These are residential areas but there is no shortage of brick kilns. A leader is building a brick kiln next to a small canal in my area. All the leaves of the nearby coconut

trees or other trees are withered, no fruit is bearing any more. This brick kiln also has specific laws but it is not enforced. There are many other such laws in our country which have no enforcement.

If people are inside a room the temperature will be slightly higher because we are giving off carbon dioxide. Similarly everyone is moving to Dhaka city considering our Dhaka city as the only source of income. If different mill factories could decentralize them, take them to different district levels, there would not be so many mill factories here. The 34 ministries that we have can be kept without keeping them all inside Dhaka. If the main ten ministries were kept in Dhaka and the rest could be scattered around Dhaka, then I think the environmental pollution would have been reduced. When I hear, the end of the world covered with environmental pollution is a little shame.

Bisik is an industrial city, not a residential area, but there are houses here, that's why we live here. As the fumes are released, it is seen in the morning that the surrounding becomes dark for some time. In other countries mill-factories run but no one can see the smoke. The amount of washing is increasing day by day, I don't see any initiative to reduce it.

Various types of waste water, these are increasing day by day, but I don't see any sign of reducing them. In 1988 there were fish in the canal, I caught fish in that canal. Now not even a single fish can be found in the canal. Because the polluted water is going down the canal, the fish are dying. For which I see day by day we are suffering from loss. Although there is an obligation to see them, there is no one to see them. So far in Tongi I have not seen anyone doing the duty. The River Port Authority has provided pillars on both sides of Turag River. It did this only to determine the boundaries of the river.

It is an industrial area, with a large number of people living here. Sometimes there are water problems like non-availability of water supply. Garment workers are more. As a result, I think the environment of Tongi area is much more toxic than that of Dhaka.

Water consumption has increased but once the water pump breaks it is not fixed even in 10 days to 15 days. Can't eat the food that is coming. The water in the supply is very smelly, dirty and cannot be consumed. Because they raise underground water, which comes through pipelines, these old pipes have rusted and burst and mixed with the drain water. Only those with deep tubewells are able to drink water. A water pump has been installed from the city corporation, but the pipe line is long-standing which is connected to the drain. When the pipe bursts, the drain water enters it. We told our problems to the councillor. But the main responsibility of everything is the government. If city corporation takes initiative through ward council then the problem can be solved.

Motor bikes are the biggest source of noise pollution. Boys of young age start a panic by suddenly honking their horns when they see girls or many people standing together. 15-24 year old kids are riding these bikes. Too many people honk when we walk on the road. There are many jams, naturally the cars cannot move forward, even though everyone is honking. I think a legal action should be taken against it.

I have this school since 2012. I have total 12 rooms, about 22 fans in them. Since 2012, the electricity bill

has increased a lot. Because now it is seen that it is hot during summer, and sometimes fan is needed during winter also. The only reason it gets hotter is because it is an industrial urban area. Summer time and winter time have also been manipulated a lot. We don't perceive floods as cyclones.

Overall, electricity consumption has increased in this area. Electricity is now in everyone's home. At one time, 300 taka phone load would last for 1 month, now it doesn't. Such is the case with lights. Where one lamp used to be used, now we are using four lamps. As the population increases, so does the demand.

The cost of water has increased more than before. Where earlier 2 pumps were needed, now 4 pumps are required. Increasing the number of pumps. Even just taking measures to repair the pipes will solve the problem.

The water layer in Tongi area is very low for which 400-450 feet minimum depth is required. Last 10 years ago water was available at a depth of 200-250 feet. Again it takes a little less in Hyderabad area. Depletion of the water layer is very dangerous for us. As earthquakes may occur, other natural disasters may occur.

I feel very bad that garbage is thrown in the open. All the garbage is being dumped on the main road next to Shilamhan road. The place is cleaned every 15 days with a big pickup. The people of the city corporation take this waste there in vans. Daily household waste is dumped there. The wife is also throwing garbage on the south side of the market. The market next to it, stinks a lot. We pay Tk 200 for garbage disposal, and the house owners who have workers take Tk 50 from them.

Garment wastes are thrown next to Shilamhana, then they burn them in fire every morning. The leaves of the trees near the Nitali Bridge next to the railway line were burnt to fuel the fire. Sold those that were salable.

Asthma patients have increased where previously there were fewer asthma patients. Itching, itching, and mosquitoes have increased a lot. Diseases increased due to garbage disposal. In my school every room has to light the coil in the morning. Before the students arrive.

And for the last two to three years, paddy production has decreased in Hyderabad. We can no longer eat bill fish. A few days ago I bought Mala fish and could not eat it. Water pollution for these garments is responsible for this. Turag River does not require any soap to wash clothes. Thousands of pieces of cloth from the factory are washed in the Turag river. I have not seen any initiative taken by the city corporation till now.

Coming this morning, the rickshaw puller is smoking. As far as I know smoking in public has a fine of Rs 500. But due to our lack of awareness this law is not enforced. There is no implementation in the law. Councilors are not playing an effective role, we are not considered when we complain to the government office.

Today most of the people are dying of cancer and respiratory problems which are the main causes of this environment. So I think that to protect the next generation I should stop this environmental pollution. We need an environment where we can live happily and peacefully with our children.

## ANNEX XII

### Transcript: Interview with CSO/NGO Stakeholder

#### Nasir Uddin Bulbul, Senior Sub-Editor, The Bangladesh Today

House next to BSCIC group. Father's house, grandfather's house is here. Migrate here. Father migrated here from Brahmanbaria. That's why we are here. Father took a job in Tongi. He came after independence. Mother died 27/28 years ago.

A few days ago went to my village home, son and daughter said that the house is broken and looks like a slaughterhouse. My village house is very beautiful. School next to the house. The land of that school is also ours.

I feel honored to speak with you. BILS is a prestigious institution. I feel very good. It is a very big institution. I have been to Bills many times.

I participated a meeting on environmental issues a few days ago. It seems that journalists are enemies of many. In fact, journalists are not enemies of anyone. Again, our main thing is to present the right information to people so that people get the right information.

Garments are a big contribution to our country. In 1964, Tongi BISIC Industrial City of Gazipur established. Even, before the independence of the country, Tongi was known by the whole country as an industrial city. There are more than 200 factories here. 80% are garments factory. More than 100 thousands people are directly employed. Tongi was once a desolate area with very few houses until about 80s or 42 years ago. People were coming for work, housing started expanding to provide shelter to these workers. There are two aspects of air and environmental pollution, decomposable wastes and non-perishable wastes. Plastic waste is not decomposable. We have almost 7 lakh people living here, Tongi is the most populous city within Gazipur. Within the 64 districts of Bangladesh, the environment of Gazipur is most polluted. The main reason is industrial wastes. You will see, colored water mixed with chemicals from the wash is going to the Turag River.

Earlier, garment factory workers used to bathe in Turag river. People used to drink this water. I saw after independence, the water of Turag river was clean. The rule is to have ETP in the factory, refine the toxic water and then discharge it to the river, but the factory owners are not doing that. Turag water was clean then, good quantity of fish was available, now there is no fish; earlier fish from Turag water was sold in market; There was a bill, the fish of that bill was eaten before; No more fish are found in that bill; The fish that are found are not fit for consumption. Houses getting build non-stop; does not provide proper safety tanks; all contaminated liquid waste is discharged directly into the drain. The roads in front of the factories are so bad that the workers have to go through them with difficulty. There are many types of dirty water on this road.

Later it is seen that the workers are suffering from various skin diseases, water borne diseases. The dirty water from the factory comes to the street and it is hot water. Later, the workers were seen suffering from various skin diseases.

Many types of jute are traded because of garments. Means, the small cloths of the garment carry many types of dirt. Around lakhs of people are involved in jute business. There are many types of dirt in the cloths due to which the traders suffer from various respiratory diseases; especially women workers and school going children; they suffer from various diseases including respiratory problems such as skin diseases; they are directly related to environmental pollution. Everyone should be made aware to prevent air and environment pollution. If we are not aware this problem will not be solved. We all have to work together. Women workers in garments often suffer from skin diseases. Now child labor has reduced, earlier this kind of skin disease was seen in children too. No doctor, many workers in garments who have doctors say that they give only one medicine for all diseases and that is paracetamol.

A variety of chemicals are responsible for major environmental pollution. There were not so many houses before. This place was an open field. We would have moved here on 25th December. My house is near Bisik area. Earlier there were few Christian houses here. There were only two markets in Tongi. There was no market within three kilometers. Now there are many markets, factories have increased, population has increased. A lot of development is going on in the country. But, there is no improvement in waste management system. The situation is getting worse day by day.

Everyone has to work on environmental issues. City Corporation should raise awareness about these issues. It was decided long ago that wastes will be stored in the Kashimpur area. A power plant will be constructed, these wastes will be used there. Wastes are being dumped elsewhere, this has not improved. Garbage is dumped in the river due to which the river water is getting wasted.

The soil has changed a lot. Red soil is no longer available as before. Gazipur, which is famous for its resorts, has a lot of difference between the soil there and the soil here. There were many jackfruit trees in Gazipur now there are no jackfruit trees. The fruit of that jackfruit tree was very sweet. Buildings are increasing, roads are increasing, as a result of which water is accumulating, particularly rain water is accumulating, and soil is getting polluted.

There is no such soil as it was before. Different types of chemicals are dumped on the ground, garbage is dumped. You will see that if any tree grows there, that tree is burning immediately, why due to excess garbage. I am talking about arranging recycling. Instead of throwing the buckets that are wasted in use, plant trees in them, then the environment will be saved. The use of electricity gas cylinders has increased by 100 percent. I have never been to a green factory but the garment factory is growing.

The weather is changing. Winter is lessening. We don't get vegetables like we used to get during winters. Development work continued; different types of bridges and over bridges getting constructed. Development is good, but due to this development we are facing various diseases due to air pollution. The weather has changed. The season has changed. Earlier, winter was supposed to start from the month of Kartik, now it is

not like that. Winter has waned. The severity of winter has decreased. The duration of summer is increasing. Gazipur no longer has cyclones/floods like before. Now there are big buildings due to which cyclones do not form like that. There are two types of floods. Man-made floods and natural floods. We do not see natural floods. Now we see man-made floods that when it rains a little, water accumulates on the roads, mosquitoes.

The environment in BSIC is more dirty because it is an industrial area, there is more garbage, dust and air pollution. Roads are now better inside BCIC. However, water clogs the roads and the water stinks and is plagued by mosquitoes. There is covid, well there is. Opportunistic owners don't see these.

No one is seen coming forward in environmental work. There are many laws, nios-laws but the laws are not being used that way. Solar power usage has not increased. No one is aware.

Noise pollution has increased due to factories, vehicles. Noise pollution causes eye damage. Because of smoke eyes burnt.

City Corporation does not come here properly even if we complain to the corporation. BCIC has the responsibility to maintain the environment but it does not fulfill its responsibility properly. We pay taxes to the city corporation. There is a tussle between the City Corporation and the BSIC, due to which the work is not done properly.

If you go to the City Corporation, they say go to the Department of Environment. Again, the Department of Environment says that there are owner authorities who are responsible for this. As such, problems remain as it is, do not solve.

Most people migrate internally because of poverty, river erosion may be a main cause often. Climate change or the environment may also be the cause, but it is difficult to understand. Most doesn't want to continue agricultural work anymore. Technology is a big reason. Now irrigation water is given with machine-pumps, less labor is required. People are moving towards cities. 30% of people are coming as a result of river bank erosion. Faridpur, Sirajganj are more prone to river erosion.

Since Gazipur is an industrial area, environmental pollution is high here; Population is also high; therefore, it is expected that those who are in environmental affairs will definitely come forward to prevent environmental pollution and take appropriate measures. ETP should be kept operational then water/air pollution will be less. Recycling arrangements should be made for waste disposal. Environment and climate change needs to be researched in detail.



## ANNEX XIII

### Important quantitative data analysis and tables

#### Demographic attributes of the survey respondents

Gender Status		Marital Status	
Status	%	Status	%
Men	32.1 (129)	Unmarried	12.7 (51)
Women	67.9 (273)	Married	84.5 (339)
		Divorced	1.0 (4)
		widow/widower	1.7 (7)
Total 723	100 (402)	Total	100.0 (402)
Age of the Respondents		Educational status	
less than 18	2.7 (11)	Illiterate	.7 (3)
18-22	18.9 (76)	Can sign only	11.4 (46)
23-27	28.9 (116)	Can read only	2.2 (9)
28-32	21.9 (88)	class 1-5	20.6 (83)
33-37	16.4 (66)	Primary pass	11.7 (47)
38-42	7.0 (28)	Class 6-10	31.6 (127)
43-47	2.7 (11)	SSC	11.7 (47)
48-52	1.2 (5)	HSC	8.2 (33)
53 & above	.2 (1)	Bachelor and above	.7 (3)
		Madrassa	1.0 (4)
Total	100.00		

#### Resource use status at living place

Status of Climate Change Parameters	Increased		Same		Decreased		Wastage/no use	
	Frequency	%	Frequency	%	Frequency	%		
Water usage	257	63.9	86	21.4	54	13.4	5	1.3
Electricity usage	292	72.7	58	14.4	52	12.9	-	-

Electric fan usage	391	97.4	11	2.6	-	-	-	-
Solar power usage	21	5.3	7	1.7	13	3.2		89.8
Gas usage	299	74.4	64	15.9	35	8.7	4	1.0
Diseases	342	85.1	11	2.7	49	12.2	-	-
Mosquitos/ Insects/ Pest attack	371	92.3	13	3.2	18	4.5	-	-

### Rain water harvesting practice

Rain water harvesting status	
Status	%
Yes	8.5 (34)
No practice	88.5 (356)
Common	1.7 (7)
Little practice	1.2 (5)
<b>Total</b>	<b>100 (402)</b>

### Status of climate change at living places

Status of Climate Change	More		Same		Less	
	Frequency	%	Frequency	%	Frequency	%
Status of heat and hot	361	89.8	14	3.5	27	6.7
Status of flooding	128	31.8	10	2.5	264	65.7
Status of storms/cyclones	138	34.3	15	3.7	249	61.9
Status of heavy rainfall	45	11.2	26	6.5	331	82.3
Status of rainfall	62	15.4	6	1.5	334	83.1
Status of drought	210	52.2	22	5.5	170	42.3
Status of wind	43	10.7	56	13.9	303	75.4
		35.0		5.3		59.6

### Reasons for seasonal variation/abnormality

Table: Reasons for seasonal variation/abnormality	
Status	%
Climate change as a reason	49.5 (199)
Environmental reason (Pollution)	25.1 (118)
Allah given	20.2 (95)
Natural reason	5.0 (20)
Don't know	38.3 (154)
Sin	1.5 (7)

### Status of Water Resource usage at living places

Source of water		Water consumption per family per day	
Status	%	Status	%
Supply water	87.7 (352)	30 liters & more	86.1 (346)
Tube well	11.8 (48)	25-29 liters	6.5 (26)
Others	.5 (2)	20-24 liters	4.7 (19)
		19 liters or less	2.7 (11)
Total	100.0 (402)	Total	100 (402)
Status of water usage		Seasonal issue in water access	
Same as before	21.4 (86)	Scarce in summer	38.4 (157)
Consumption increased	63.9 (257)	Available in rainy season	5.4 (22)
Consumption reduced	13.4 (54)	Scarce in winter	5.6 (23)
More wastage now	1.3 (5)	Same always	50.5 (206)
Total	100.0 (402)	Total	102 (408)

### Status of safety of water and air

Do the water safe?		Do the air safe?	
Status	%	Status	%
Fresh & pure	73.9 (297)	Fresh & pure	33.8 (136)
Average	17.4 (70)	Average	28.1 (113)
Slightly polluted	6.0 (24)	Slightly polluted	11.9 (48)
Heavily polluted	2.7 (11)	Heavily polluted	26.1 (105)
Total	100.0 (402)	Total	100.0 (402)

### Status of resource use efficiency in the RMG Factories

Status of re-sources con-sumption	Increased		Same		Decreased		Don't know/ No usage	
	Frequency	%	Frequency	%	Frequency	%		
Electricity	316	78.5	58	14.5	15	3.8	13	3.3
AC usage	42	10.4	360	89.6	-	-	-	-
Electric fan usage	301	74.9	101	25.1	-	-	-	-
Generator usage	215	53.5	55	13.7	116	28.9	16	3.9
Petroleum/diesel	196	48.8	45	11.3	29	7.3	131	32.6
Solar power	59	14.7	70	17.5	36	9.0	236	58.8
Water consumption	260	64.8	65	16.1	11	2.8	66	16.3
Gas usage	178	44.4	108	26.8	10	2.4	106	26.4
Chemical usage	51	12.7	103	25.6	25	6.1	224	55.6
Mean average		44.7		26.7		8.6		28.1
Usage increased	36.7%							
Aggregate increase	54.6%							

### Environmental concerns inside RMG factories and good practices

Environmental concerns inside RMG factory		Good practices	
Status	%	Status	%
Technological inadequacy	6.2 (25)	Harvest rain water or in process	3.6 (14)
No water treatment facility	16.7 (67)	Water treatment plant	15.8 (82)
Insufficient ventilation	13.4 (54)	Water pollution control	17.9 (93)
Excessive chemical usage	11.9 (48)	Solid wastes treat properly	5.6 (24)
Excessive resource usage	25.9 (104)	New technology	13.4 (54)
Frequently discharge at natural environment	7.7 (31)	Environment sensitive chemical usage	<b>3.7 (19)</b>
No environment protection policy	44.3 (178)	Sound pollution control	<b>11.2 (58)</b>
No resources use guidelines	35.3 (142)	Resources usage guidelines	<b>64.7 (260)</b>
No care	8.0 (32)	Improved WM practices	21.8 (113)
Structural issues	22.4 (90)	Environment protection policy	55.7 (224)

High water consumption in washing and dying	43.3 (174)		
No change	48.3 (194)		
Pollutes water	45.0 (181)		
Air pollution	41.0 (165)		
Sound pollution	43.5 (175)		
Dirtiness (inside and outside)	14.6 (59)		
Soil degradation	9.2 (38)		
Health vulnerability from environmental causes	14.9 (60)		

### Workers/TUs awareness and participation

Status of workers awareness of policy/guidelines		TU awareness/knowledge of environmental and climate change policy/guidelines	
Status	%	Status	%
Aware	35.6 (143)	Informed	50.2 (202)
Unaware	64.4 (259)	Uninformed	48.8 (200)
Total	126.7 (509)	Total	102 (410)
Workers/TU participation in the formulation of policy/guidelines		Workers/TU participation in the implementation of policy/guidelines	
Good participation	33.6 (135)	Good participation	33.6 (135)
Little participation	4 (16)	Little participation	4.7 (19)
No participation	62.4 (251)	No participation	61.7 (248)
Total	100 (402)	Total	100 (402)
Skill & capacity of TUs on CC & environmental governance		Real role of TUs in climate change and environmental matters	
Can go	60.7 (244)	Yes	46.3 (186)
Cannot go	39.3 (158)	No	53.7 (216)
Total	100 (402)	Total	100 (402)



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