

Occupational Safety and Health (OSH) in the Tannery Sector

Case study on Savar BSCIC Tannery Estate

Khondaker Golam Moazzem
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Jointly Published by

Friedrich-Ebert-Stiftung (FES) Bangladesh and
Centre for Policy Dialogue (CPD)

Funded by

Friedrich-Ebert-Stiftung (FES) Bangladesh

Responsible

Centre for Policy Dialogue (CPD)

Contact

bangladesh@fes.de

Design and Printed by

Lithograph, 41/5, Purana Paltan, Dhaka

Cover Design

Avra Bhattacharjee

Copyediting

HM Al Imran Khan

Page lay-out and typesetting

Md Shaiful Hassan

Citation: Moazzem, K. G., & Jebunnesa. (2024). *Occupational Safety and Health (OSH) in the Tannery Sector: Case study on Savar BSCIC Tannery Estate*. Centre for Policy Dialogue (CPD) and Friedrich-Ebert-Stiftung (FES) Bangladesh.

Abstract

The paper explores the occupational safety and health (OSH) conditions at the Savar BSCIC Tannery Estate, with a focus on the challenges and opportunities following the relocation of tanneries from Hazaribagh. The study also underscores the importance of OSH compliance in safeguarding worker welfare and enhancing the competitiveness of Bangladesh's leather sector in the global market. Despite investments in infrastructure and environmental protections at the new estate, significant gaps remain, including weak enforcement of safety regulations, absence of safety equipment and inadequate worker training. These deficiencies create industrial safety risk and hinder the sector's alignment with international standards. The study emphasises the need for collaborative efforts among policymakers, industry stakeholders, and international partners to address these challenges. Strengthening OSH frameworks in the tannery sector is vital not only for improving working conditions but also for achieving the leather sector's export target of USD12 billion by 2030. The paper concludes with evidence-based recommendations to enhance OSH practices, promote sustainable industrial development, and boost global market integration.

Acknowledgements

This paper was produced under the Friedrich-Ebert-Stiftung (FES) project titled 'Industrial Safety and Worker-Related Issues in the Tannery Sector: Assessing Occupational Safety and Health (OSH) Conditions at the Savar BSCIC Tannery Estate'.

The research team would like to thankfully acknowledge the continuous support from *Mr Tamim Ahmed*, Senior Research Associate, Centre for Policy Dialogue (CPD). We are also deeply grateful to the Department of Inspection for Factories and Establishments (DIFE), Bangladesh Tanners' Association (BTA) for their valuable insights and support throughout the study.

Our sincere appreciation goes to officials from both national and international organisations who participated in dissemination events and contributed their perspectives on improving OSH practices within the tannery sector. Special thanks to *Mr Iqbal Hossain*, Programme Advisor at the FES for his cooperation and input.

The authors also wish to acknowledge the support of *Mr Avra Bhattacharjee*, Joint Director, Dialogue and Outreach, CPD, and *Mr HM Al Imran Khan*, Publication Associate, CPD, for their assistance in finalising this manuscript. Their contributions were instrumental in ensuring the successful completion of this paper.

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Acronyms

BDT	Bangladeshi Taka
BFLLFEA	Bangladesh Finished Leather, Leathergoods, and Footwear Exporters Association
BLA	Bangladesh Labour Act 2006
BNBC	Bangladesh National Building Code
BSCIC	Bangladesh Small and Cottage Industries Corporation
BTA	Bangladesh Tanners' Association
CETP	Common Effluent Treatment Plant
CPD	Centre for Policy Dialogue
DIFE	Department of Inspection for Factories and Establishments
DoL	Department of Labour
EU	European Union
FSCD	Fire Service and Civil Defence
FY	Fiscal Year
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HSC	Higher Secondary Certificate
ILO	International Labour Organization
ISO	International Organization for Standardization
LFMEAB	Leather Goods and Footwear Manufacturers and Exporters Association of Bangladesh
LIMA	Leather Industry Management Assistance
LWG	Leather Working Group
MoLE	Ministry of Labour and Employment
OSH	Occupational Safety and Health
PPE	Personal Protective Equipment
RHS	Raw Hides and Skins
RMG	Readymade Garments
SSC	Secondary School Certificate
UNIDO	United Nations Industrial Development Organization
USD	United States Dollar

1. INTRODUCTION

Despite abundant domestic resources like raw hides and inexpensive labour, as well as favourable conditions such as lower energy costs and export incentives, the leather sector of Bangladesh struggles to reach its full export potential. Lack of occupational safety and health (OSH), as well as poor environmental compliance of the tannery and footwear factories, are responsible for the weak performance in the global market (UNIDO 2021). According to the National Plan of Action on Occupational Safety and Health (2021–2030), the leather sector, including the tannery, is recognised as one of the hazardous and high-risk industries concerning occupational safety and health.

While the global leather goods market is projected to surge, reaching an estimated value of USD 624 billion by 2028, Bangladesh's export in leather goods and footwear stagnated at USD 1.2 billion in FY2023, marking a 1.74 per cent decline compared to the previous fiscal year. Additionally, the country's leather exports remain highly concentrated, with over 80 per cent of leather and footwear products being shipped to limited number of destinations (only 10 countries in FY2023). Without improving the OSH and environmental challenges, leather and leather goods could hardly reach the major export markets of Europe and North America.

The success of the leather sector is closely tied to the performance of tanneries, which process raw animal hides into leather. Unfortunately, the outlook for Bangladesh's tannery industry is even more challenging. Among various issues, the hazardous working conditions in tannery factories pose a serious risk to worker safety and health. These unsafe practices hinder the attainment of international compliance certifications, which in turn negatively impact the industry's global competitiveness and growth.

With the aim of ensuring a safe working environment and better environmental compliance, the largest tannery hub located in Hazaribagh in Dhaka has been shifted to a new industrial estate in Savar, Dhaka. It is to be noted that Hazaribagh tannery hub was not properly maintained. The practice of tanning in open and congested areas in Hazaribagh led to severe health risks for both the workers and nearby residents. Research has shown that individuals working or living near the tanneries suffered from skin, gastrointestinal, respiratory, cardiovascular, and eye problems, as well as chronic headaches, allergies, and other health issues (Islam et al., 2017). As a result, in 2017, tanneries from the Hazaribagh cluster were relocated to the newly established BSCIC tannery estate in Hemayetpur, away from Dhaka city. This relocation is aimed to promote environmentally friendly tanning practices, maintain work safety and protect the occupational health of workers.

In this context, the study seeks to conduct a review analysis focusing on the post reallocation OSH conditions at the BSCIC tannery estate in Savar. The findings are expected to support ongoing government efforts to improve compliance at the tannery estate, with the ultimate goal of increasing leather sector exports to USD 12 billion by 2030.

2. OBJECTIVES OF THE STUDY

The main objective of this study is to identify the state of progress of industrial safety, particularly in tanning factories and establishments in Savar estate, identifying the safety concerns at the micro level; level of compliance as per safety policies, laws, and rules; providing a set of recommendations that are expected to contribute to increasing workers' workplace safety and security in these factories. More specifically, the objectives of the study include the following-

- a) To specify the production process and OSH hazard in the tannery industry to better understand the possible risks;
- b) To review the field-level scenario of the OSH standard in the Tannery estate;
- c) Review activities undertaken by the public and private agencies, particularly the DIFE, the FSCD, and owner associations, etc., in undertaking technical assessments and pursuing regular monitoring of their compliance standards to identify the gaps;
- d) Construct policy recommendations that may help improve the existing occupational health and safety conditions.

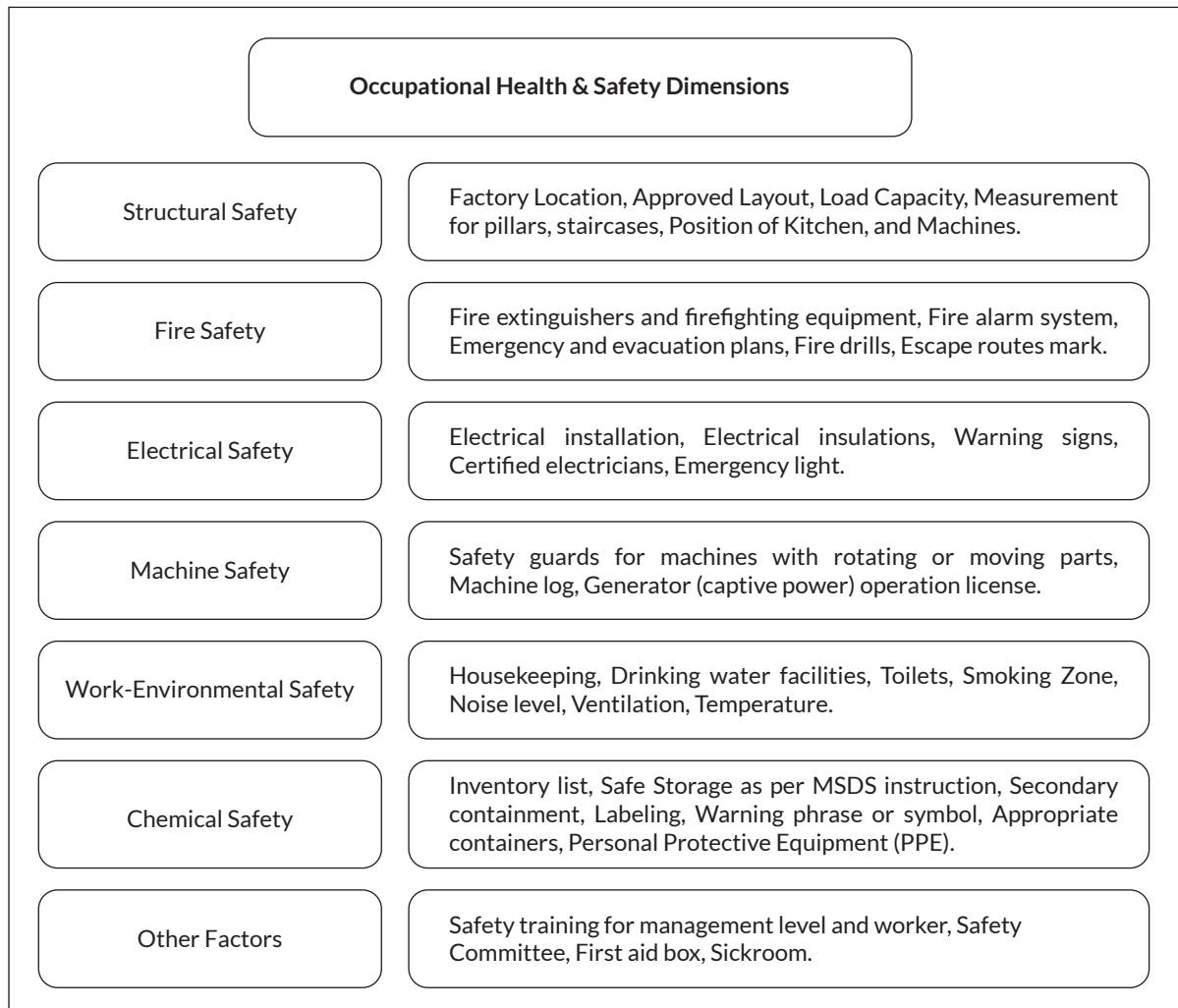
3. METHODOLOGICAL APPROACH OF THE STUDY

3.1 Analytical frame

Nowadays, reputable international companies evaluating potential suppliers from developing countries consider not only the quality and price of leather or leather products but also compliance with national labour safety standards. These standards typically encompass a range of certifications addressing structural, fire, and electrical safety within the factory, as well as safety practices including factory rules and worker training. In industries such as tanneries, where the production of leather involves extensive use of chemicals, machinery, and equipment, there is also a focus on machine and chemical safety practices. In addition to meeting international standards and guidelines, there is a growing focus on ensuring worker welfare through the availability of essential facilities, such as clean toilets and adequate washing areas, as a fundamental aspect of promoting OSH.

Considering these factors, the study will follow the following analytical framework (Chart 1). As per the abovementioned objectives of the study, the analytical framework for the assessment is constructed by adopting the guidelines on occupational safety and health management systems (ILO-OSH 2001). It will focus on industry-level safety issues of the tannery hub from the OSH point of view under seven primary components. In addition to the six major components such as – Structural Safety, Fire Safety, Electrical Safety, Machine Safety, Chemical Safety, Work Environment, the study will also review the performance of regulatory body and different stakeholders' perception on the post reallocation OSH scenario.

Chart 1: Factors Contributing to Workers' Safety and health



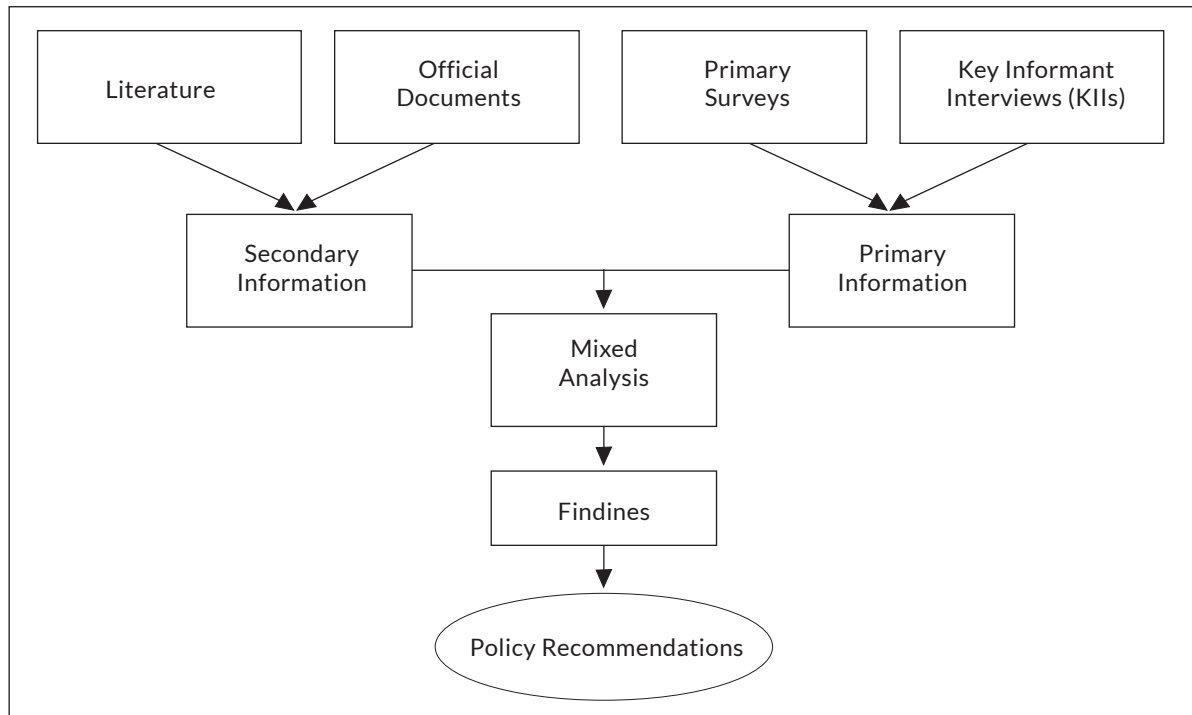
Source: Authors' illustration based National Profile on Occupational Safety and Health in Bangladesh (2019).

3.2 Methodology of the study

The study focuses on industry-level safety issues of the tannery hub from the point of view of occupational safety and health (OSH). For that, a number of data-collecting tools is employed to carry out the study (Chart 2). These include a telephone interview conducted on 15 tannery workers; 5 key informant interviews; data from CPD Tannery Survey 2024 where 36 factories and 105 workers were surveyed; field visits to the estate; and a review of literature and secondary data sources.

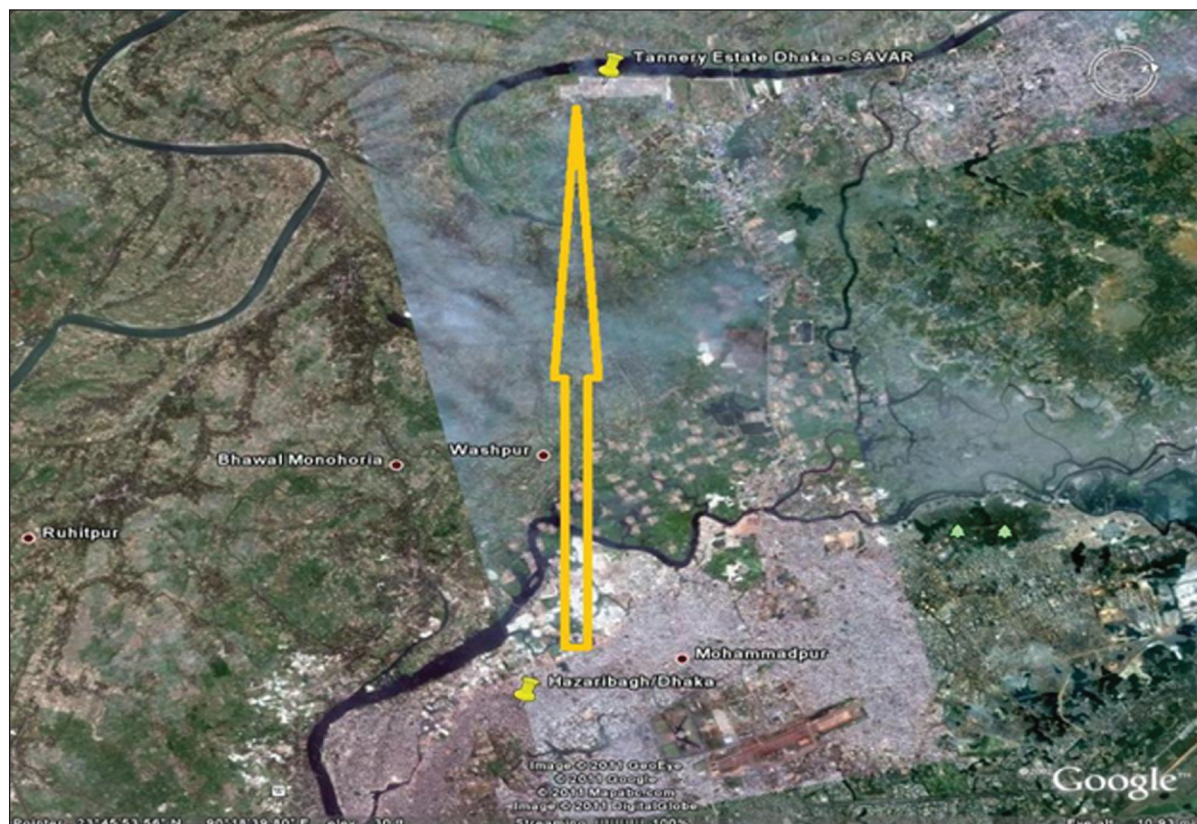
The collected data is utilised to realise the research objectives stipulated in the preceding section. The analytical frame will be used to achieve the first and third objectives of the study, which is to evaluate the current enterprise-level OSH practice of the tannery estate. This approach ensures that each component of the OSH is thoroughly reviewed allowing for

Chart 2: Methods for Collecting Data and Information from Different Sources



Source: Authors' illustration.

Figure 1: Tannery Reallocation Site



Source: UNIDO Leather Panel.

a comprehensive evaluation of the tannery estate’s safety practices. On the other hand, the collected data on institutions responsible for safety monitoring will be analysed to achieve the second objective of the study, which is to assess the role of government agencies responsible for safety monitoring in maintaining OSH standards in the tannery estate.

The study will focus on only the BSCIC tannery estate established in Hemayetpur, Savar (Figure 1). The targeted respondents will include all kinds of tanneries involved in different stages of the tanning process.

4. LAWS, RULES, AND REGULATIONS RELATED TO OSH CONCERNING THE TANNERY SECTOR

The OSH related rules and responsibilities of employers, workers, and regulatory authorities in the tannery sector are clearly delineated in national and international conventions, policies, laws and rules. It makes employers legally obligated to provide safe working environments by holding an entity accountable for failing to meet these standards. Tannery industry like any other sector of Bangladesh is obliged to follow certain law rules and regulations to ensure industrial safety. In addition to domestic legal framework, compliance with international OSH standards is also required for tanneries linked with exporting their leather products in international markets. Almost all global buyers require strict adherence to safety and health practices. Major conventions, policies and legal documents available in the country for OSH compliance are discussed below. A summary is presented in Table 1.

Table 1: Laws, Rules, and Regulations Related to OSH Concerning the Tannery Sector

Law/Regulation	Key OSH Requirements
ILO Convention No. 155	- Development of comprehensive safety programmes
ILO Convention No. 170	- Safe use and management of chemicals
Bangladesh Labour Act (2006)	- Provision of Personal Protective Equipment (PPE) - Fire exits and emergency preparedness - Regular safety inspections - Adequate ventilation and lighting
National OSH Policy (2013)	- Preventive measures and risk management - Worker training and education - Risk assessments
Environmental Conservation Act (1995)	- Proper chemical handling and disposal - Wastewater and solid waste management
Leather Working Group (LWG) Certification	- Safe chemical management, proper labelling, and worker protection - Implementation of worker health and safety practices
ISO 45001	- Structured OSH management systems - Worker involvement in safety planning - Emergency preparedness and response plans

Source: Authors’ compilation based on Ministry of Labour and Employment.

4.1 ILO Conventions

Several conventions of the International Labour Organization (ILO) also set global standards for workplace safety, which are particularly relevant for industries like tanning. These

include conventions on safety and health in the workplace (e.g., ILO Convention No. 155 on Occupational Safety and Health) and conventions on the use of dangerous substances (e.g., ILO Convention No. 170 on Safety in the Use of Chemicals at Work). Many international buyers expect tanneries to comply with these conventions, even if national enforcement is weak.

4.2 National OSH Policy (2013)

The National Occupational Safety and Health (OSH) Policy (2013) is the first of its kind that solely focuses on improving safety standards across all industries. The policy paper promotes multi-dimensional preventive measures, risk management, and worker training. The documents also highlight the need for hazard prevention through the use of modern safety equipment and protocols. Additionally, it puts emphasis on the role of worker training to ensure that employees understand the risks they face and know how to protect themselves.

4.3 Bangladesh Labour Act (2006)

The Bangladesh Labour Act (2006) and its amendments serve as the fundamental legal framework for the workers' safety and welfare in all industrial sectors, including the BSCIC tannery estate in Savar. The act outlines clear obligations for employers, requiring them to provide safe working conditions by maintaining specific guidelines for electrical and fire equipment as well as structural modification guidelines. The act also mandates employers to take preventive measures such as providing appropriate personal protective equipment (PPE) and conducting regular inspections of workplace facilities to reduce workplace hazards and ensure workers' safety during operations involving dangerous chemicals and heavy machinery.

4.4 Environmental Conservation Act (1995)

The Environmental Conservation Act (1995) indirectly affects worker safety by regulating the handling, storage, and discarding of hazardous materials, such as the substances used in leather processing. The act mandates that industries, including tanneries, adhere to strict environmental regulations to limit pollution and protect both workers and the surrounding community from toxic exposures.

4.5 Leather Working Group (LWG) Certification

The Leather Working Group (LWG) is an industry-led certification programme that assesses the environmental performance of leather manufacturing facilities. While primarily focused on environmental sustainability, LWG certification also includes compliance with OSH standards. Tanneries must demonstrate safe chemical handling, adequate worker protection, and adherence to safety protocols in order to obtain this certification, which is becoming increasingly necessary for accessing global markets (LWG, 2021). In Bangladesh, the availability of a Common Effluent Treatment Plant (CETP) required by the LWG certification committee has gained much more popularity than the requirements of OSH standards mentioned under the certification procedure. While the condition of CETP is important to fulfil, awareness of the OSH aspects is also necessary. Otherwise, availing the LWG certifications will be proven to be difficult.

4.6 ISO 45001

One of the most important international standards is ISO 45001, which provides a framework for occupational health and safety management systems. Specifications under the ISO 45001 requires organisations to improve workers' safety, reduce workplace risks, and create better, safer working conditions. Exporting tanneries are increasingly required to meet ISO 45001 standards to ensure that they comply with international OSH expectations (ISO, 2018)

In conclusion, the current legal framework in Bangladesh provides a solid foundation for OSH in the tannery sector (Table 1). However, enforcement gaps continue to hinder compliance with safety protocols.

5. OVERVIEW OF THE TANNERY SECTOR IN BANGLADESH

Most of the country's tanneries were originally located in the Hazaribagh area of Dhaka, but due to severe environmental and health concerns, they were relocated to the Savar Tannery Estate in 2017. This estate now houses over 150 tanneries, and at present there are 137 tanneries operating, making it the primary hub for leather processing in the country (World Bank, 2020). The sector now employs over 85,000 workers, approximately. A more detailed analysis of the type of products, their production process and tanning workers are given below.

5.1 Production process of BSCIC tanning estate

Before moving forward to the main objective of our study of reviewing the current status of OSH in tannery estate, there is a need to shortly explain the nature of this industry to better understand the type of compliance needed to improve the OSH conditions.

The tanning process in Bangladesh involves three main stages: tanning, re-tanning (or drying/pre-finishing), and finishing. Each stage produces intermediate products like wet blue, crust leather, and finished leather, which are essential to the leather supply chain.

5.1.1 Tanning Stage

This is the first step where raw hides and skins (RHS) are converted into a stable material called wet blue leather.¹ The process uses a variety of chemicals, especially chromium salts, to prevent decomposition and improve the durability of the hides.

- Machines Required: Drum for soaking and tanning, Fleshing machine (to remove excess flesh and fat), Shaving machine (to thin the hides), Splitting machine (to split hides into layers) (UNIDO, 2012)
- Chemicals Required: Chromium salts (e.g., chromium sulfate), Lime (for dehairing), Sodium sulfide (to remove hair), Sodium chloride (salt for preservation), Enzymes (for bating, softening the leather) (Choudhury, 2000).

¹Wet blue is essentially leather tanned with chromium, giving the leather a shade of blue (Strasser, 2015).

5.1.2 Re-Tanning/Drying/Pre-Finishing Stage

In this stage, additional value is added to the wet blue to produce crust leather, which is semi-finished. This process involves more precise chemical treatments to achieve specific qualities based on customer demands.

- Machines Required: Drum for re-tanning, Drying tunnels or vacuum dryers, Staking machine (to soften the leather), Buffing machine (to smooth and polish the leather surface)
- Chemicals Required: Vegetable tannins or synthetic tannins (for re-tanning), Dyes (for colouring), Fatliquors (to lubricate and soften the leather), Fillers (to fill imperfections in the hide) (Heidemann, 1993).

5.1.3 Finishing Stage

This final stage involves processing crust leather into finished leather. Here, treatments are applied to give the leather its final appearance and characteristics, such as smoothness, colour, and texture.

- Machines Required: Roller coaster or spray booth (for applying finishing chemicals), Ironing machine (to smooth the surface), Embossing machine (for texture or pattern), Measuring machine (to measure finished leather for quality control) (Sundar et al., 2011).
- Chemicals Required: Topcoat (to protect and seal the surface), Pigments (for colour enhancement), Lacquers and polyurethane finishes (for gloss or matte finish), Waterproofing agents (Choudhury, 2000).

Each stage of the tanning process requires specific machinery and chemical treatments to ensure the leather achieves the desired quality for either domestic or international markets. Although in the BSCIC tannery estate, the whole process of production is divided into sub-stages, depending on the final products. While the large factories operate the whole process inside their factory, the medium to small and micro-factories work on the specific stages of the entire process.

5.2 Distribution of Work at the Tannery Factory

The work distribution inside a tannery factory generally requires workers to either work with chemicals, lift heavy materials, or operate machineries. According to the CPD Tannery Survey, which surveyed 105 workers, a proportion of work distribution can be visualised. As per the survey, on average, 53.3 per cent of workers were operating machines, around 39 per cent were engaged in chemical handling, 38 per cent were involved in lifting heavy materials, and only 6.7 per cent were engaged in manual handling of materials/dry skins (Table 2).

Table 2: Type of activities surveyed workers involved in their work

Activities	% of workers
Managing chemical	39.1
Operating machine	53.3
Lifting heavy materials	38.1
Manual handling of materials	6.7

Source: CPD Tannery Survey 2024.

The tannery itself is a heavy industry, unlike the readymade garment (RMG), which is labour-intensive in nature. In any tanning factory, typically 25 to 30 workers are adequate to complete all the daily work (Ahmed, 2024). As very few workers operate in a large space, and each stage requires a number of chemical and machine usage, instead of fire and electrical safety, the hazard related to chemicals and machine operation in this industry.

Production in this sector is export-oriented, with more than 80 per cent of the leather and leather goods produced being shipped abroad. Major export destinations include the European Union, the United States, Japan, and China (Bangladesh Leather and Footwear Association, 2021). However, as per the Bangladesh Tanners' Association (BTA), the absence of the LWG certification led the sector to export finished leather to mostly China and limit their capability to export direct leather products to brand buyers like Nike, H&M, Puma, and Hugo Boss.

5.3 Types of products

The Bangladeshi tannery sector is known for producing a wide range of leather products, including finished leather, leather goods, and footwear. The raw materials primarily come from local sources, particularly from cattle hides, with some additional imports. The types of products range from leather for garments and shoes to more specialised items like gloves, bags, and accessories.

5.4 Export Performance of Tannery Factories

The major export destinations for Bangladeshi tannery products include the European Union (EU), the United States, Japan, China, and South Korea. The EU is the largest importer, with countries such as Italy, Germany, and Spain being significant buyers of Bangladeshi leather goods and footwear (Bangladesh Leather and Footwear Association, 2021).

The export performance of Bangladesh's tannery industry has been analysed based on the data of a primary survey conducted in 2024.² The export performance has undergone significant changes between 2020 and 2024, indicating a trend of narrowing market reach and product offerings across the industry.

²CPD has carried out a primary survey in 2024.

Table 3: Number of Export Destination in 2020 and 2024

Number of Countries	2020			2024		
	Large	Medium	Small	Large	Medium	Small
1	0	16.7	0.0	20	33.3	8.3
2	0	16.7	25.0	20	16.7	20.3
3	40	33.3	4.2	40	0.0	16.7
4	0	0.0	12.5	20	16.7	0.0
5	40	0.0	4.2	0	0.0	8.3
6	0	16.7	4.2	0	0.0	0.0
7	20	0.0	0.0	0	0.0	0.0
8	0	0.0	4.2	0	0.0	0.0
Total	100	83.3	54.2	100	66.7	54.2

Source: CPD Tannery Survey 2024.

In 2020, large companies in the tannery sector were exporting to a wider range of countries, with 40 per cent of these companies exporting to three countries and an additional 40 per cent exporting to five countries (Table 3). Some large companies even reached as many as seven export destinations. However, by 2024, a marked shift in strategy was observed. While 40 per cent of large companies continued to export to the three countries, a significant portion (20 per cent) had reduced their focus to just one or two countries. Medium-sized companies exhibited a similar pattern of change. In 2020, these companies exported to a variety of destinations, with 33.33 per cent exporting to three countries, and a diverse spread across six, two, and one country as well. By 2024, there was a notable contraction in export destinations, with one-third (33.33 per cent) of medium companies exporting to only one country. Meanwhile, the share of companies exporting to three or more countries diminished. Small companies also streamlined their export destinations over the four-year period. In 2020, these companies exported to as many as eight countries, with 25 per cent exporting to two countries and others exporting to three, four, or more. By 2024, the focus had narrowed, with the majority of small companies now exporting to two or three countries.

Table 4: Number of Products Exported in 2020 and 2024

Number of Export Products	2020			2024		
	Large	Medium	Small	Large	Medium	Small
2	40	33.3	25.0	60	16.7	25.0
3	20	0.0	8.3	40	16.7	20.8
5	20	0.0	12.5	0	16.7	4.2
6	20	16.7	4.2	0	16.7	4.2
7	0	33.3	0.0	0	0.0	0.0
8	0	0.0	4.2	0	0.0	0.0
Total	100	83.3	54.2	100	66.7	54.2

Source: CPD Tannery Survey 2024.

A similar trend was seen in export products. In 2020, 40 per cent of large companies exported two products, with others exporting up to six (Table 4). By 2024, 60 per cent focused on two products, and the rest exported three. Medium and small companies also narrowed their offerings, moving from up to seven products in 2020 to mostly two or three by 2024. Factories, regardless of size, have reduced both the number of export destinations and the diversity of products they offer. This shift likely reflects changing global market dynamics. With more advanced machineries and more demand worldwide, the product variety or destinations should have been broadened, but the international market for Bangladeshi tanners are contracting. Meaning, either the companies are failing to supply what the international buyers are looking for or the brands are cutting off orders due to lack of compliance certification.

5.5 Workers' Demography

Workers' demographic composition such as age, gender, education, and cultural background—can significantly influence the nature of the risks they face, their response to hazards, and the specific safety interventions they require (Gochfeld, 2005). Ignoring demographic factors can lead to ineffective safety protocols, as different groups within the workforce may respond differently to training, equipment usage, or physical strain (Koehn et al., 2013). Considering this, the following section provides an overview of the demographic characteristics of workers working in the tannery estate.

Table 5 presents key demographic details about the workers, focusing on their average age, years of work experience, and levels of educational attainment. The mean age of the workforce is 36.8 years, ranging from 17 to 60 years, many of whom are in the middle of their professional careers. On average, workers in this industry have 16.4 years of working experience. This suggests that most employees have extensive knowledge of their roles and the industry in general. A more experienced workforce can often result in fewer accidents and injuries, as familiarity with the job tends to improve operational safety (Niskanen et al., 2014). However, if the safety culture is not introduced in an appropriate manner, workers may become resistant to adopting new safety procedures, relying instead on habitual practices that may no longer be safe.

Table 5: Workers' age, experience and education details

Mean age of workers	Mean experience of working	Educational attainment of workers					
		Never went to school	Class 1- 5	Class 6 - 10	SSC passed	HSC passed	More than HSC
36.8 Years	16.4 Years	3.8%	47.6%	37.2%	6.7%	2.9%	1.9%

Source: CPD Tannery Survey 2024.

As per the survey, approximately 3.8 per cent of the tannery workers never attended school, which may limit their ability to engage with technical information or comprehend complex safety regulations. The largest group, 47.6 per cent, has completed primary education (Class 1-5), which provides a basic level of literacy and numeracy but might still limit these workers' ability to absorb advanced training material or handle technical tasks. Another 37.2 per cent of workers have completed secondary education up to Class 10, while 6.7 per cent have passed

the Secondary School Certificate (SSC). These groups may be better equipped to understand safety instructions or job-specific protocols. A small proportion of the workforce (2.9 per cent) has completed the Higher Secondary Certificate (HSC), and only 1.9 per cent have education beyond that level (Table 5). The low percentage of highly educated workers highlights the need for industry-specific training programmes that are accessible to those with limited formal education, ensuring that all workers, regardless of educational background, can follow safety guidelines effectively.

Table 6 focuses on the employment types within the workforce and highlights the industry’s reliance on contractual labour, particularly in smaller tanneries. Of the workers surveyed, 32.4 per cent are employed on a contractual basis, indicating that nearly a third of the workforce lacks permanent employment (Ahmed, 2024). Contractual workers often face job insecurity, which can affect their engagement with workplace safety. Since they may not receive the same level of training or investment as permanent workers, there could be inconsistencies in their knowledge of safety protocols. In contrast, 65.7 per cent of the workers are employed as permanent staff. These workers are more likely to receive continuous training, have access to benefits, and potentially exhibit greater knowledge of workplace safety standards. A small percentage (1.9 per cent) of the data was not classified, indicating some ambiguity in the employment status of a few workers.

Table 6: Type of Job Contracts

Job type-wise distribution of workers (% of workers)			% of surveyed tanneries hired contractual workers through third-party		
Contractual	Permanent	Not sure	Large	Medium	Small
32.4%	65.7%	1.9%	10%	10%	80%

Source: CPD Tannery Survey 2024.

Table 3 also provides insights into the hiring practices of tanneries based on their size. Only 10 per cent of large tanneries hire contractual workers through third-party agencies. Similarly, 10 per cent of medium-sized tanneries also outsource labour, but the majority of their workers appear to be permanent employees as well, suggesting that the majority of these companies prefer to employ workers directly, possibly due to greater financial resources that allow for a more stable workforce. This contrasts sharply with small tanneries, where 80 per cent rely on third-party agencies to provide contractual workers. Smaller businesses likely lack the financial resources to maintain a fully permanent workforce, leading them to rely heavily on temporary labour. This heavy reliance on contractual workers in smaller tanneries can present challenges for maintaining consistent safety standards, as contractual workers may not receive the same level of safety training or engagement as permanent employees.

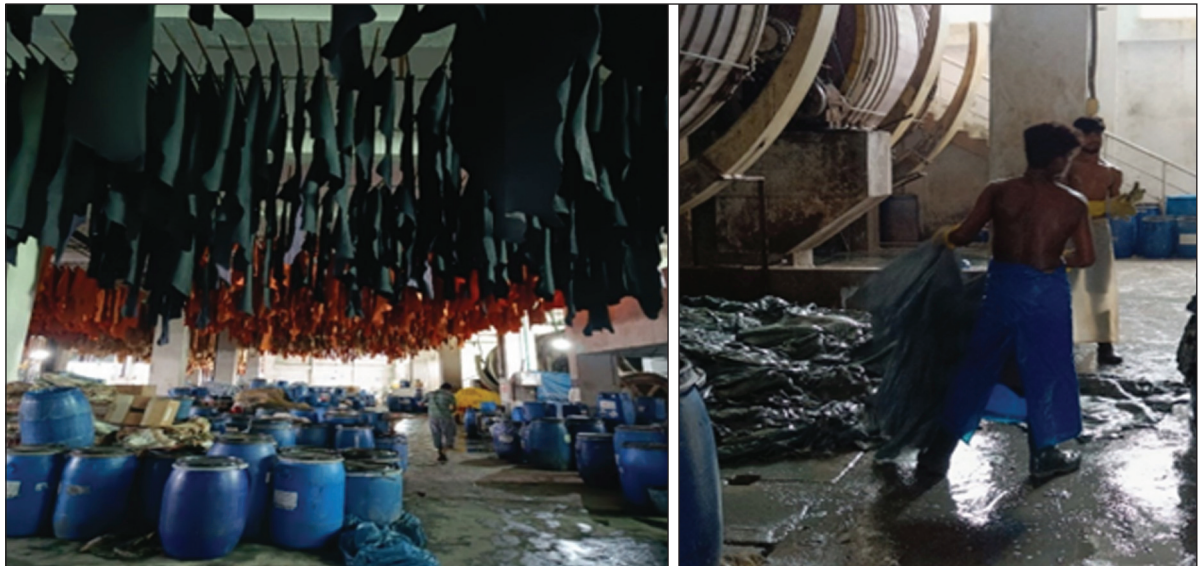
There also seems to exist a gender imbalance in the workforce, with a significant majority of 96.2 per cent of workers being male and only 3.8 per cent of the workers being female. This overwhelming predominance suggests that the tanning industry, like many manufacturing sectors, may be male dominated, potentially limiting opportunities for female workers.

6. SAFETY STATUS AT THE BSCIC TANNERY INDUSTRIAL ESTATE

6.1 Chemical Safety

Chemical safety is a significant concern at the Savar Tannery Estate, where over 200 chemicals are utilised throughout the tanning process. Many workers were observed handling these chemicals during the rawhide-to-crust phase without wearing any Personal Protective Equipment (PPE), such as boots or masks. Only a few workers had polythene sheets wrapped around their waists, which they claimed were to protect their clothes from getting wet. When asked if this was a recommended safety measure by factory managers, workers indicated that it was a personal choice, driven by a desire to keep their clothing clean rather than a concern for chemical exposure (Figure 2).

Figure 2: Chemical handling inside a factory



Source: Authors' Capture, 2024.

This situation reflects a troubling priority among workers, who appear more focused on the visibility of their clothing rather than the potential risks posed by the chemicals. Literature indicates that the substances used in this industry can cause slow poisoning, with effects that may not be immediately apparent (World Health Organization, 2016). The impact of inadequate chemical safety practices is evidenced by the prevalence of various health conditions among workers (Table 7). Notably, a significant percentage of workers reported allergies (64.8 per cent) and respiratory diseases (41.9 per cent), which may be linked to exposure to hazardous chemicals in the workplace. Additionally, skin diseases were reported by 27.6 per cent of workers, while eye diseases affected 32.4 per cent and chronic headaches were experienced by 21.9 per cent of the workers.

Table 7: Prevalent Health Issues Among Workers

Diseases	% of workers
Skin disease	27.6
Gastrointestinal disease	4.8
Cardiovascular disease	1.9
Eye disease	32.4
Chronic headache	21.9
Allergies	64.8
Respiratory disease	41.9

Source: CPD Tannery Survey 2024.

Moreover, the storage of chemicals raises further safety concerns (Figure 3). Chemicals were found scattered in drums throughout the factory, with most lacking proper and transparent labelling. Although a designated storage area exists under an office room, the disorganised storage practices pose additional risks to worker safety.

Figure 3: Chemical Storage and Labelling status



Source: Authors' Capture, 2024.

6.2 Machine Safety

Machine safety is another critical area requiring improvement at the Savar Tannery Estate (Figure 4). While new machinery has been introduced for high quality leather processing, the associated safety equipment is often inadequate. Many machines remain unguarded, exposing

Figure 4: Unguarded Machine Operating



Source: Authors' Capture, 2024.

workers to potential injuries. According to the International Labour Organization (ILO), unguarded machinery significantly increases the risk of workplace accidents, which can result in serious injuries or fatalities (ISO, 2018). Although larger factories typically display safety manuals for operating machineries, this practice is not consistently followed in medium and small factories. Often times the safety protocols are written in English, which makes it difficult for the workers to comprehend the message written on the manual.

In larger facilities, a specific individual with an engineering background is often hired to oversee machine safety. Furthermore, these factories demonstrate a habit of record-keeping, including documentation of regular maintenance and safety checks for machinery. However, such practices are notably absent in smaller factories (Figure 5).

Figure 5: Machine Handling of Worker and Safety Instructions in English Language



Source: Authors' Capture, 2024.

6.3 Structural Safety

According to officials, significant improvements in safety standards were observed in the tannery industry following the relocation from Hazaribagh to the Savar tannery estate. One of the key advancements was in structural safety, owing to the planned layout of the new estate. Plots were allocated according to production needs, allowing for open spaces between factories. This design not only provided better airflow and work environments but also created safe evacuation zones in case of emergencies such as fires or earthquakes. Additionally, the wider roads between the factories improved accessibility for emergency services, contributing to overall safety.

As per the Bangladesh National Building Code (BNBC), specific fire safety measures for industrial buildings, also applies to the Savar Tannery Estate. While most of the larger factories complied with important safety regulations such as – segregated zones for different production processes, open rooftops, specific zone for placing boiler outside factory and well-placed emergency exits, smaller tanneries are struggling to meet these codes, particularly in terms of building fire-resistant infrastructure and maintaining adequate fire exits (Figure 6). When interviewed, smaller factory owners reported struggling to operate at full capacity due to the relocation process associated with high costs and time.

Figure 6: Wide Estate Opening Route and Different Operation Section



Source: Authors' Capture, 2024.

6.4 Fire and Electrical Safety

Fire safety at the Savar Tannery Estate has improved in certain aspects, especially for larger factories that comply with structural safety regulations, yet it still falls short in meeting the standards required by the Bangladesh Labour Act 2006 (BLA). Under the BLA, factories must provide adequate fire safety measures, including clearly marked exits, sufficient firefighting

Figure 7: Fire and Electrical Safety Instructions



Source: Authors' Capture, 2024.

equipment, and regular fire drills. Compliance with these laws is stronger in larger tanneries at the estate, which have made progress in providing two-way staircases, fire exits, and open spaces that serve as evacuation points during emergencies (Figure 7).

However, many smaller tanneries are failing to completely align with these legal requirements. Due to the financial burden of relocation and the high costs of maintaining operational capacity, smaller factories often lack the funds to invest in necessary fire safety equipment such as extinguishers, fire alarms, and sprinkler systems. This puts workers at increased risk, especially in industries like tanning where hazardous chemicals are regularly used and has higher risk for fire-related accidents.

In the case of electrical safety, a lack of proper insulation for electrical wires and the presence of unplanned switchboards and wiring connections is observed even in large factories. Factories do not check for electrical malfunction unless any problem arises in electricity supply. Most of them have yet to establish and implement a systematic process for the regular inspection of electrical insulation and wiring. Polli Biddut (the Rural Electrification Board) supplies electricity to the estate and is mandated to conduct annual electrical certification checks to ensure an uninterrupted power supply. Unfortunately, the authorities of the Polli Biddut rarely visit the factories to perform these necessary inspections.

6.5 Work Environment

Housekeeping: Housekeeping practices at the Savar Tannery Estate are notably inadequate, characterised by persistent issues such as wet floors, damp raw hides stored in open spaces, and solid waste being dumped in temporary yards. These conditions contribute to strong odors throughout the factory, affecting even the office areas. Currently, workers are responsible for cleaning these areas only when they become overly cluttered or when wastewater begins to clog the drainage systems. This reactive approach to housekeeping is insufficient for maintaining a safe and healthy workplace (Figure 8).

Lighting, Ventilation and Noise management: Most tanneries in the Savar Tannery Estate have reported adequate lighting systems, contributing to a safer working environment. Given that the estate is situated in open spaces and most factories are either single or, in rare cases, two stories, there is a notable trend toward utilising natural sunlight within the factories. This not only enhances safety but also promotes energy savings, reducing operational costs.

The estate generally showcased a good ventilation system. However, given the humid nature of our climate and the raw hides inside the factories, workers perceive the condition of ventilation to be unfavourable and unpleasant odors persist throughout the facility.

As shown in table 8, a significant 79.1 per cent of workers reported tolerating high levels of noise, while 72.4 per cent indicated they work in hot and humid conditions. The fact that a majority of workers are exposed to high noise levels underscores the need for effective noise management strategies. Additionally, working in hot and humid conditions can lead to discomfort and health

Figure 8: State of Factory Floor on a Random Day



Source: Authors' Capture, 2024.

risks associated with heat, making it essential for the estate to consider measures to improve thermal comfort for its workforce.

Table 8: Status of Working Environment

Working Condition	% of workers
Tolerate high levels of noise	79.1
Work in hot and humid conditions	72.4

Source: CPD Tannery Survey 2024.

Workload: Occupational Safety and Health (OSH) is closely linked to work hours, as longer working hours can lead to increased fatigue and stress, significantly impairing workers' health and safety. Prolonged shifts are associated with a higher risk of accidents, musculoskeletal disorders, and mental health issues, as evidenced by research indicating that excessive working hours contribute to burnout and decreased productivity (Ala-Mursula et al., 2006; van der Hulst, 2003).

Table 9 indicates how many days per week workers are engaged in their jobs. A notable 59 per cent of workers report working 6 days a week, while 41 per cent work 7 days. In addition, on a daily basis, workers tend to work as long as up to 12 hours shift per day. This data reflects a common practice in the manufacturing sector, where extended working hours can be required to meet production demands. The high percentage of workers working 6 days suggests a need for continuous operation in the tanneries, which could impact workers' well-being and ergonomic balance.

Table 9: Overview of Daily Workload and Hours

Working Days	Freq.	Per cent
6	62	59.0
7	43	41.0
Total	105	100.0
Daily work Hour	Freq.	Per cent
8	40	38.1
9	25	23.8
10	26	24.8
11	1	1.0
12	13	12.4
Total	105	100.0

Source: CPD Tannery Survey 2024.

Workers' benefit: The most commonly provided benefit is workplace accident compensation, with 48.6 per cent of workers entitled to it, highlighting the acknowledgment of safety concerns within the industry. Canteen facilities (29.5 per cent) and rationing (20.0 per cent) also appear relatively common, reflecting the need to support workers during their shifts. In contrast,

health insurance is the least provided benefit, with only 5.7 per cent of workers entitled to it, suggesting significant gaps in healthcare coverage for employees (Table 10). On the other hand, the average health cost increased significantly from BDT 583.3 in 2022 to BDT 751.2 in 2023, representing a 29 per cent rise. The maximum health cost also increased substantially, from BDT 4500 to BDT 8000, indicating that some workers may face considerable healthcare expenses. Interestingly, the minimum health cost remained unchanged at 100, suggesting a baseline level of healthcare expenditure that does not vary among workers.

Table 10: Type of Health-related benefits and Monthly Health Cost of Worker

Type of Benefits	Entitled (% of workers)
Health Insurance	5.7
Tiffin allowance (during duty)	14.3
Canteen facilities	29.5
Rationing	20.0
Workplace accidents compensation	48.6
Dedicated uniform	20.0
Appointment letters	12.4

Source: CPD Tannery Survey 2024.

Table: Monthly Medical Cost of Workers

Monthly Health Cost	2022	2023
Average Health Cost	583.3	751.2
Maximum Cost	4500.0	8000.0
Minimum Cost	100.0	100.0

Source: CPD Tannery Survey 2024.

These findings highlight a concerning relationship between workers’ non-wage benefits and their health costs. Despite a substantial percentage of workers facing increasing health costs—both average and maximum—only a small proportion (5.7 per cent) are entitled to health insurance. This gap indicates a potential vulnerability for workers, as rising health costs could lead to financial strain, particularly for those without adequate insurance coverage. Moreover, while compensation for workplace accidents is relatively high (48.6 per cent), it primarily addresses post-incident needs rather than preventive health measures. The low entitlement to health insurance, coupled with rising healthcare costs, suggests workers may not be adequately protected against health-related financial burdens.

Besides, despite occupying a significant area in Savar, the estate lacks a designated medical centre or sick room for the workers. Additionally, there are no canteen facilities nearby, forcing many of the workers to rely on snacks from adjacent tea stalls or to skip meals altogether, as the nearest restaurants are located far outside the estate.

7. PERFORMANCE OF MONITORING AND REGULATORY AUTHORITY

The performance of monitoring and regulatory authorities is critical in ensuring occupational safety and health (OSH) in any industry. The relocation of the tannery factories from Hazaribagh to a more confined location in Savar estate should have made it easier to monitor and inspect the compliance issues more effectively. This section explores the role of both public sector institutions and private sector associations in regulating and promoting safety standards within the industry and review their performance in executing their role.

7.1 Public Institutions: Monitoring and Regulatory Roles

Several public sector institutions have been assigned to oversee safety practices in the Savar tannery estate. These institutions are responsible for enforcing regulations, conducting inspections, and ensuring compliance with safety standards. Some of the major authoritative body includes –

Bangladesh Small and Cottage Industries Corporation (BSCIC): As the governing body of the tannery estate, BSCIC is tasked with the overall management and development of the estate. Its role includes ensuring that the infrastructure, facilities, and environment are conducive to safe industrial operations. However, BSCIC has faced challenges in maintaining proper waste management systems and environmental standards, impacting both the safety and health conditions for the workers.

Department of Inspection for Factories and Establishments (DIFE): The DIFE is responsible for inspecting factories to ensure compliance with labour laws, including national and international OSH standards. In the tannery estate, the DIFE's role is crucial in monitoring working conditions, checking for the use of protective equipment, and ensuring that machineries and facilities adhere to safety norms. However, despite being one of the major industries in Bangladesh, there is no reporting of accidents, injuries or number of inspections in the DIFE's annual report of inspection report. Where the segregated data on inspection should have been publicly displayed on their website LIMA, there is just an overall summary given in a website where it shows over last 5 years, there has been a total of 26 inspection in Tannery industry (Table 11).

Table 11: DIFE Inspection in Tannery factories (Jan 2020- Jan 2024) as per LIMA

Location	Total Inspection out of 170 Factories	Number of non-compliance
Gazipur	3	7
Dhaka	21	2107
Jashore	2	174

Source: LIMA Website.

However, recently a specific checklist for inspecting tannery factories has been formulated with the help from GIZ, where the Ministry of Labour and Employment (MoLE) is playing the

role of partner ministry and the DIFE is working as the implementing agency. As per a DIFE official, the checklist is already included in their training manuals and LIMA.

Ministry of Labour and Employment (MoLE): The MoLE formulates labour policies, including OSH regulations, and plays a key role in implementing these across the tannery estate. It provides oversight to ensure that employers are adhering to the legal frameworks that protect workers' safety and health. Despite these efforts, there are gaps in enforcement and inconsistent application of policies over different industries.

Fire Service and Civil Defence (FSCD): The FSCD is responsible for fire safety regulations and emergency preparedness in industrial areas, including the tannery estate. Regular fire drills, inspections of fire-fighting equipment, and fire safety training are part of their mandate. While FSCD conducts these activities, the frequency of drills and the adequacy of fire safety measures are often questioned, leading to vulnerabilities in emergency preparedness. There is also absence of fire station near the estate.

Office of the Chief Inspector of Boilers: This office is responsible for inspecting and certifying industrial boilers, which are used extensively in the tanning process. Regular inspections are essential for preventing boiler-related accidents. However, the frequency and thoroughness of these inspections remain areas of concern.

Polli Biddut (Rural Electrification Board): The Polli Biddut provides electricity to the tannery estate and ensures that electrical safety standards are maintained. Its role involves inspecting electrical systems and ensuring that any hazards are promptly addressed. Despite its commitments in documents to inspect electrical wiring, electrical safety remains a critical issue.

7.2 Private Sector Engagement in Enhancing OSH Practices

In addition to public sector institutions, private sector associations play a vital role in promoting OSH standards within the tannery estate. Key organisations include the Bangladesh Tanners Association (BTA), the Leather Goods and Footwear Manufacturers and Exporters Association of Bangladesh (LFMEAB), and the Bangladesh Finished Leather, Leathersgoods, and Footwear Exporters Association (BFLLFEA). These associations often work alongside public agencies to enhance compliance and raise awareness about workplace safety. The organisations generally set up requirements for their membership approvals where some OSH standards are also included. To become a member, the factories must comply with these requirements. In addition, these associations work to improve industry standards through providing training to the management and workers. The trainers are often selected through collaboration with government bodies, and international partnerships. Although the employers' associations play a significant role in raising awareness, their initiatives often face challenges, particularly with smaller factories. These factories are often unwilling to be part of any association and sometimes rent their factories to 3rd parties for operating in seasonal demand.

8. RECOMMENDATIONS FOR IMPROVING THE OSH SCENARIO IN THE BSCIC SAVAR ESTATE

8.1 Recommendations Related to Laws, Rules, and Regulations: Bangladesh has a robust framework of legal documents to safeguard workers' safety, such as the Bangladesh Labour Act 2006 and the National OSH Policy 2013. However, the major challenge lies in weak enforcement. The government must establish stricter monitoring mechanisms and increase penalties for non-compliance to ensure factory owners fully adhere to safety regulations. New legal provisions should be developed to address specific needs, such as the management of hazardous chemicals like chromium, which pose significant health risks. These provisions must be clear, actionable, and designed to protect both the workers and the environment.

8.2 Recommendations for BSCIC: The Bangladesh Small and Cottage Industries Corporation (BSCIC) must ensure that sufficient infrastructure and support services are available at the Savar Estate. This includes providing emergency medical services, proper waste management systems, and access to clean water for all workers. The BSCIC should conduct regular audits of factory operations to assess compliance with OSH standards, providing constructive feedback and support where necessary. Furthermore, the BSCIC must collaborate with local healthcare providers to ensure workers have access to comprehensive health services, including accident insurance and preventive healthcare, fostering a safer and healthier work environment.

8.3 Recommendations for Factory Owners: Each factory in the BSCIC Savar Estate must implement a comprehensive OSH management system, focusing on regular risk assessments, emergency preparedness, and stringent chemical safety management practices. Factories also should conduct periodic safety training for workers, especially those exposed to hazardous substances. The use of Personal Protective Equipment (PPE), such as gloves, goggles, and respiratory masks, should be compulsory, and proper handling protocols for chemicals and machinery must be strictly enforced. Additionally, regular health screenings for workers must be mandatory to detect early signs of occupational illnesses, ensuring their well-being is consistently prioritised.

8.4 Recommendations for Improving Management's Capacity/Quality: The management authorities of the tanneries should play a proactive role in the consistent implementation of OSH standards. The management level must undergo continuous training focused on leadership in safety practices, risk mitigation, and compliance with OSH laws. They must be held accountable for the overall safety conditions in their facilities, and a culture of transparency and continuous improvement should be encouraged. In addition, management must invest in enhancing the technical skills of their teams to manage operational risks effectively and ensure rapid emergency response.

8.5 Recommendations for Improving Workers' Capacity and Quality: The tannery workers must receive continuous education on OSH standards and be trained in hazard identification and reporting, as well as emergency procedures. Specific training programmes should be designed to help them understand the risks associated with hazardous materials, such as chromium and formaldehyde. Furthermore, the workers should be incentivised to follow safety protocols to

create a culture of responsibility. Health monitoring systems should be implemented to detect and treat occupational diseases early, ensuring the workers remain healthy and productive over the long term.

8.6 Recommendations for Brands/Buyers: International brands and buyers have a crucial role in ensuring better OSH compliance within the tannery industry of Bangladesh. They must require suppliers to adhere to strict OSH standards as a prerequisite for business. A legal requirement should mandate that brands conduct on-site inspections of factories before placing orders. Additionally, the buyers must invest in providing technical support to help their suppliers achieve compliance with safety standards. Associations can be used as a platform to negotiate collaborative efforts between the buyers and the owners to enhance overall safety and operational sustainability.

8.7 Recommendations for DIFE and DoL: The Department of Inspection for Factories and Establishments (DIFE) must conduct frequent, unannounced inspections to ensure compliance with the OSH regulations. Factories found to be in violation should face immediate penalties, and the DIFE should prioritise the swift implementation of the newly developed inspection checklists. The Department of Labour (DoL) must ensure that all workers have formal contracts clearly outlining their rights to safe working conditions. Coordination between the Ministry of Labour and Employment, DIFE and DoL should be strengthened to create an efficient enforcement system, eliminating gaps and overlaps in the regulatory and implementation process.

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Imprint

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Jointly Published by

Friedrich-Ebert-Stiftung (FES) Bangladesh and Centre for Policy Dialogue (CPD)

Funded by

Friedrich-Ebert-Stiftung (FES) Bangladesh

Responsible

Centre for Policy Dialogue (CPD)

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Design and Printed by

Lithograph, 41/5, Purana Paltan, Dhaka

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