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# Safety Risks in the Plastic Sector

Assessing Enterprise-level Occupational Safety and Health (OSH) Practices

Khondaker Golam Moazzem  
Jebunnesa

**FRIEDRICH  
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FES Bangladesh



সেন্টার ফর পলিসি ডায়লগ (সিপিডি)  
Centre for Policy Dialogue (CPD)

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## Abstract

The plastic industry—with approximately 5,000 manufacturing units—is one of the major non-RMG industries in Bangladesh. However, safety concerns are prevalent in this sector. The purpose of the study was to evaluate factories' compliance with fire, electrical, chemical, and structural safety standards.

According to the findings, many factories lack basic fire safety requirements, such as open roof access, yearly firefighting drills, and essential electrical facilities. Additionally, severe safety concerns persist in these factories, with over 60 per cent neglecting crucial safety tests and training. Mishandling of hazardous substances is another hazard that persists in plastic enterprises, as 42 per cent of factories lack proper training in chemical handling. As the sector is dominated by relatively smaller enterprises, which operate in rented spaces, the study finds those factories highly noncompliant in ensuring occupational safety and health of the workers.

Against this backdrop, the study recommends that enterprises in the plastic sector should develop a five to 10-year strategic plan that aligns with global standards. This plan is essential for ensuring sustainability across the sector, including workers and markets. It will help the industry to expand beyond the domestic and non-traditional export markets and establish a compliant export-oriented sector for Europe and North America. The study also recommends that the employers' organisation should take the lead in transforming the plastic sector by formulating a revised five-year strategic plan. This plan should have a strong focus on sustainability, circularity, and workplace safety. Additionally, the membership criteria of plastic sectors employers' organisations should include prerequisites, and renewal should be based on meeting fire, electrical, and structural safety requirements.



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## Acronyms

ABS	Acrylonitrile Butadiene Styrene
BLA	Bangladesh Labor Act
BPGMEA	Bangladesh Plastic Goods Manufacturers & Exporters Association
BSCIC	Bangladesh Small and Cottage Industries Corporation
CaC <sub>2</sub>	Calcium Carbide
CPD	Centre for Policy Dialogue
DIFE	Department of Inspection for Factories and Establishments
EU	European Union
GDP	Gross Domestic Product
ILO	International Labour Organization
IWH	Institute for Work & Health
LPG	Liquefied Petroleum Gas
MSDS	Material Safety Data Sheet
NH <sub>4</sub> NO <sub>3</sub>	Ammonium Nitrate
OS	Occupational Safety
OSH	Occupational Safety and Health
PC	Polycarbonate
PE	Polyethylene
PET	Polyethylene Terephthalate
PP	Polypropylene
PPE	Personal Protective Equipment
PS	Polystyrene
PU	Polyurethane
PVC	Polyvinyl Chloride
UK	United Kingdom
USA	United States of America
WRAP	Worldwide Responsible Accredited Production



## **1. Introduction**

The plastic industry, a major non-RMG sector in Bangladesh, is contributing approximately 1 per cent of the country's Gross Domestic Product (GDP) with around 5,000 manufacturing units (The Business Standard, 2023). While a significant portion of plastic products are intended for domestic markets, Bangladesh earned USD 166.25 million in FY2020–21 through the export of plastic goods (The Financial Express, 2022). However, the plastic sector is labour-intensive in nature, which makes it prone to significant safety concerns in the workplace. As most plastic sector enterprises operate within the domestic value chain, domestic stakeholders, such as consumers and workers, do not pressurise factories to comply with safety standards. As a result, these enterprises often do not adhere to workplace safety codes and workers' rights. Inadequate monitoring and enforcement activities by public agencies further create scopes for factories to operate without proper safety standards. However, to sustain the growth of this sector, it is crucial to improve safety practices at the enterprise level.

Previously, the Centre for Policy Dialogue (CPD) undertook a study titled 'Industrial Safety and Work-Related Issues in the Plastic Sector: A Review of Policies, Laws, and Institutions'. This study reviewed key features of policies, rules, and institutional involvement and capacities of public and private agencies in enforcing fire, electrical, and structural compliances in the plastic sector. One of the salient recommendations from the study was to assess the enterprise-level Occupational Safety and Health (OSH) standards and thereby propose suggestions to improve the safety standards at the factory level.

Taking this into account, CPD has designed a follow-up study titled 'Assessing the Occupational Safety and Health (OSH) Practices in the Plastic Sector Enterprises'. The current study focuses on assessing the preparedness of plastic sector enterprises regarding OSH issues. This assessment is expected to help understand the existing compliance gaps and weaknesses of plastic enterprises in ensuring workers' safety. It will also serve as a foundation for offering recommendations on how to enhance compliance within the sector.

## **2. Research Objectives**

The study encompasses three main areas of investigation. Firstly, it aims to assess OSH-related practices at the enterprise level, with a specific focus on fire, electrical, and structural safety within industrial premises. Secondly, the study examines the extent to which laws, rules, and regulations are implemented at the factory level, aiming to understand the major challenges in ensuring compliance. Thirdly, it analyses the perceptions of plastic sector workers regarding OSH practices at the factory level.

## **3. Attribution of OSH Problems to the Plastic Sector**

The plastic industry presents unique challenges in ensuring a safe working environment for its employees, owing to its diverse manufacturing processes and widespread applications. This sector is prone to several OSH issues that require attention. Ensuring structural safety is crucial, given the reliance on heavy and complex machinery, which demands diligent maintenance and

safety inspections to prevent accidents and structural failures. However, since most plastic factories operate on a smaller scale to fill domestic needs, they often operate on rented spaces not designed according to factory set-ups. This leads to unbalanced weight distribution and scattered storage of raw materials and final products, with limited scope for structural safety compliances.

The presence of informal and unregulated segments within the plastic industry can further lead to substandard working conditions and insufficient safety protocols. The industry's reliance on complex machinery and equipment demands adequate maintenance and training to avoid accidents, such as machine-related injuries and amputations. Apart from the risk of bigger incidents taking place, the sector's rapid growth and demand for increased productivity may contribute to worker fatigue, stress, and decreased attentiveness, increasing the likelihood of minor accidents.

Fire safety also stands as a pressing concern due to the flammable nature of plastic materials, necessitating strict protocols for storage, handling, and waste disposal to prevent rapid fire spread. Moreover, the use of hazardous chemicals in plastic production exposes workers to various health risks, necessitating proper safety measures to prevent respiratory issues and other health complications. Similarly, electrical safety should not be overlooked, as faulty wiring and overloaded circuits can lead to hazardous electrical accidents. Lack of awareness and knowledge about structural, fire, and electrical OSH practices among employers and workers hinders the effective prevention and management of potential hazards.

Addressing these OSH problems within the plastic sector requires a comprehensive approach encompassing stricter regulations, improved enforcement of safety standards, heightened awareness campaigns, and targeted training programmes. By identifying the root causes and implementing appropriate measures, the plastic industry can mitigate OSH risks, fostering a safer and healthier work environment for its workforce. In addition, it is essential to consider legal provisions related to OSH practices to provide a robust framework for ensuring workers' safety and well-being in the plastic industry. Combining the assessment of legal measures with proactive safety initiatives taken by the enterprises may give a better understanding of the OSH preparedness of this sector.

## **4. Methodology**

**A. Study design:** A central focus of the study was to generate primary data and evidence related to OSH standards and practices in the plastic sector at the enterprise level. To achieve this, the study conducted a sample survey consisting of two sections during the study period.

**I. Management-level questions:** The survey included a section for the management level of the enterprises to establish the baseline situation regarding OSH-related compliances and safety measures for workers. This survey aimed to assess workplace safety status, the level of awareness and preparedness of factory owners and directors regarding industrial safety, the involvement of public agencies in factory inspections, and the engagement of local and foreign buyers on workplace safety issues.

**II. Worker-level questions:** The second section focused on workers, gathering their perspectives on OSH standards, policies, and practices within industrial units. Additionally, it explored workers' awareness of workplace safety, capacity-building measures on industrial safety, and other entitled benefits. For the worker-level survey, we aimed to cover a total of 690 workers through a stratified sampling method.

**B. Data collection methods:** This study utilised an adapted survey instrument from non-RMG factory inspection checklist of the Department of Inspection for Factories and Establishments (DIFE) for measuring OSH compliance of enterprises. And for the information collected from workers, the study adopted the OSH Vulnerability Measure survey, developed at the Institute for Work & Health (IWH), Canada, that measures the extent to which a worker may be vulnerable to OSH risks at work. The survey covered key aspects such as management commitment and employee participation, workplace analysis, hazard prevention and control, and education and training. Additionally, we incorporated open-ended questions to gather qualitative insights.

**C. Sampling strategy and sample size determination:** The sample size for the management level consisted of 50 factories, while the worker-level survey encompassed 100 workers from these factories, primarily focusing on fire, electrical, and structural safety at the factory premises. The survey locations included Dhaka, Gazipur, and Narayanganj. The factories were classified based on size: 2 large, 8 medium, 20 small, and 20 micros (Table 1).

**Table 1: Sample Size Distribution**

Size class	Factories surveyed
Large	2
Medium	8
Small	20
Micro	20

**Source:** CPD Plastic Sector Survey, 2023.

## 5. Sample Enterprise Landscape

**A. Factory demographics:** The factory demographic data offers crucial insights into the distribution and characteristics of factories within the study. The section portrays the demographic views of the factories based on the number of workers, district locations, nature of ownership, type of building, presence of apartments or residential units and type of building ownership.

The data in Table 2 reveals the distribution of sample factories based on the number of workers in three districts: Dhaka, Gazipur, and Narayanganj. There are 33 factories in Dhaka, with 14 factories employing between 1–15 workers, 16 factories employing between 16–50 workers, and 3 factories employing between 51–300 workers. In contrast, Gazipur has 12 factories, with 3 factories employing between 1–15 workers, 2 factories employing between 16–50 workers, 5 factories employing between 51–300 workers, and 2 factories employing more than 300 workers. In Narayanganj, 3 factories have 1–15 workers, 2 factories have 16–50 workers, resulting in a total of 5 factories. Overall, there are 20 factories with 1–15 workers, 20 factories with 16–50



workers, 8 factories with 51–300 workers, and 2 factories with more than 300 workers, making a total of 50 factories.

**Table 2: Factories Based on the Number of Workers and Location**

District	1 to 15	16 to 50	51 to 300	More than 300	Total
Dhaka	14	16	3	0	33
Gazipur	3	2	5	2	12
Narayanganj	3	2	0	0	5
<b>Total</b>	<b>20</b>	<b>20</b>	<b>8</b>	<b>2</b>	<b>50</b>

Source: CPD Plastic Sector Survey, 2023.

All 50 factories surveyed have full Bangladeshi ownership, indicating that the plastic sector in the region is predominantly domestically owned. Out of the 50 factories surveyed, 28 (56 per cent) are in rented space, 20 (40 per cent) are in owned places, and 2 (4 per cent) have both rented and owned buildings (Table 3). The majority of micro (55 per cent) and small (80 per cent) enterprises are in rented space.

**Table 3: Factory Building Ownership Status**

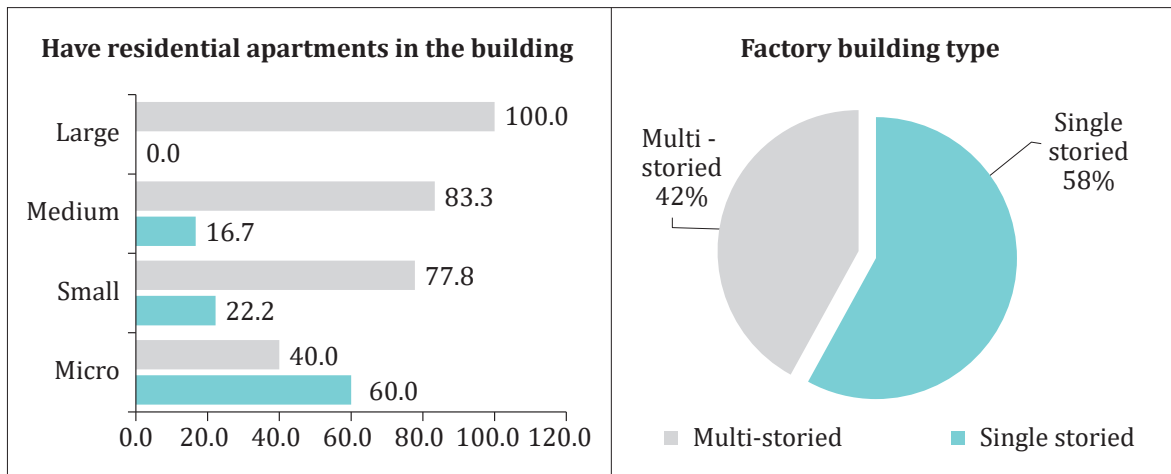
Factory type	Rented	Owned	Both	Total
Micro	55.0	45.0	0.0	100.0
Small	80.0	15.0	5.0	100.0
Medium	12.5	75.0	12.5	100.0
Large	0.0	100.0	0.0	100.0
<b>Total</b>	<b>56.0</b>	<b>40.0</b>	<b>4.0</b>	<b>100.0</b>

Source: CPD Plastic Sector Survey, 2023.

Of the 50 factories, 29 (58 per cent) are located in single-storied buildings, while the remaining 21 (42 per cent) are situated in multi-storied buildings (Figure 1). A large section of micro enterprises (60 per cent) and small enterprises (22.2 per cent) are located in residential apartments. Even a section of medium enterprises is also located in residential apartments. No large enterprises are located in residential apartments.

**B. Market exposure:** The data on market exposure (Table 4) in the plastic sector highlights valuable insights into the international market presence of the surveyed factories. As seen in the RMG sector, brand buyer plays a vital role in influencing OSH practices in the factories. So, market exposure in certain areas may have an influence over the OSH practices in plastic enterprises. Out of the 50 factories surveyed, 12 factories (24 per cent) reported having market exposure, indicating that they engage in exporting their products to foreign countries. On the other hand, 38 factories (76 per cent) reported no market exposure, suggesting that they primarily operate within the domestic market.

**Figure 1: Building Types and Information about the Existence of Residential Apartments**



Source: CPD Plastic Sector Survey, 2023.

**Table 4: Export Profile of Factories**

Product export participation	Frequency	Per cent
Yes	12	24
No	38	76
<b>Total</b>	<b>50</b>	<b>100</b>

Source: CPD Plastic Sector Survey, 2023.

For the factories engaged in exports (Table 5), the data presents a breakdown of the major countries they exported to in the last year. China, the United States (USA), Italy, Canada, and Saudi Arabia emerged as significant export destinations, as more factories exporting to these countries. The United Kingdom (UK), Spain, Germany and Malaysia also received products from 5 to 4 factories, respectively. This indicates that majority of factories are outside the purview of international safety standards usually followed in the European Union (EU), USA, Canada, and Australia. Even those who export to the non-traditional markets somewhat follow fewer safety standards than those followed in major developed markets.

**Table 5: Export Destinations of Factories**

Export destinations	Frequency	Export destinations	Frequency
China	24	Denmark	6
USA	16	Spain	8
Canada	16	Slovakia	4
Austria	2	France	6
Belgium	4	Germany	8
Italy	16	Australia	4

(Table 5 contd.)

(Table 5 contd.)

Export destinations	Frequency	Export destinations	Frequency
Netherlands	6	Malaysia	8
UK	10	India	4
Saudi Arabia	12	United Arab Emirates (UAE)	6

Source: CPD Plastic Sector Survey, 2023.

**C. Employment and management structure:** In the surveyed plastic factories, the majority of the factories (40 per cent) have between 1–50 workers. Additionally, 16 per cent of factories have 51–300 workers, while only 4 per cent have more than 500 workers (Table 6).

**Table 6: Distribution of Factories by Workers**

Number of workers in the factory	Frequency	Per cent
Less than 15	20	40
16-50	20	40
51-300	8	16
More than 500	2	4
<b>Total</b>	<b>50</b>	<b>100</b>

Source: CPD Plastic Sector Survey, 2023.

Additionally, Table 6 reveals the plastic sector is a male-dominated sector—the ratio of male and female workers in the sector is around 80:20. The ratio is severe against female workers in micro enterprises—only 5 per cent are female workers. Worker composition in large enterprises is modestly in favour of female workers (30 per cent). Table 7 shows that the percentage of female employees increases as the size of the factory increases.

**Table 7: Proportions of Male and Female Workers Based on Factory Size**

Factory size	Female worker	Male worker
Large	30.2	69.8
Medium	25.8	74.2
Small	21.8	78.2
Micro	4.8	95.2
Overall	20.7	79.3

Source: CPD Plastic Sector Survey, 2023.

The following data table illustrates the years of experience of management-level employees in both their current workplace and the industry. The sector has relatively young management professionals having experience between 3–10 years. Table 8 provides insight into the years of experience of management-level employees in their current workplace and within the industry. It reveals that a substantial portion of employees (23) have three to five years of experience in the

industry, of which 12 were gained within the current workplace. It also reflects a gradual decline in the number of employees as the years of experience increase, with fewer employees in the higher experience ranges. Table 8 also provides valuable insights into the managerial expertise and tenure within the plastic sector, guiding our understanding of the industry's workforce dynamics. There are only 4 people in the industry out of 50 who have more than 20 years of experience in the industry. Either the experienced worker switched industry or was let go by the employers as they aged.

**Table 8: Years of Experience of Management-Level Employees in Current Workplace and Industry**

Years of experience of management level employee	In current workplace (in number)	In the industry (in number)
1-2 years	3	2
3-5 years	23	12
6-10 years	12	17
11-15 years	7	7
16-20 years	3	8
21-25 years	2	3
26-30 years	0	1
<b>Total</b>	<b>50</b>	<b>50</b>

Source: CPD Plastic Sector Survey, 2023.

**D. Membership status:** Private organisations such as employer organisations and labour unions are crucial in promoting a culture of OSH in any industry. Their contributions and support in safeguarding workers' well-being are significant for policymakers, industry stakeholders, and the workforce. By fostering collaboration, these organisations help create a safer and more secure working environment for everyone involved.

Table 9 provides valuable insights into the involvement of private organisations within the plastic sector. Among them, Bangladesh Plastic Goods Manufacturers & Exporters Association (BPGMEA) stands out with the highest frequency, reflecting their significant influence in the sector. Few are members of other organisations, particularly Plastic Byabosayee Samity, and few are not members of any organisation (6 per cent).

**Table 9: Membership of Employer Organisations**

Name of employer organisations	Frequency	Per cent
Bangladesh Plastic Goods Manufacturers & Exporters Association (BPGMEA)	47	94
Bangladesh PVC Compound or Pipe Manufacturers Association	10	20
Bangladesh Plastic Byabosayee Samity	24	48

(Table 9 contd.)

(Table 9 contd.)

Name of employer organisations	Frequency	Per cent
Bangladesh Plastic Packaging, Roll Manufacturers Owners Association	10	20
None	3	6

Source: CPD Plastic Sector Survey, 2023.

## 6. Assessment of OSH Practices at the Enterprise Level

The assessment of OSH practices at the enterprise level focused on evaluating the level of safety measures related to fire, electrical, and structural safety. Under this section, specific indicators were considered such as fire safety, electrical safety and structural safety, compliance status with legal provisions, and accidents and injury incidents in surveyed factories as a part of the overall OSH practices assessment at the enterprise level.

**6.1. Level of fire safety practices:** Fire safety practices in factories are a crucial area of investigation to ensure the safety and well-being of workers and the protection of factory premises against potential fire hazards. Fire incidents can have devastating consequences; therefore, it is essential to assess the current state of fire safety practices in plastic factories, analysing key aspects such as the availability of fire safety facilities, worker access to potential fire risk areas, and the types of chemicals used in the factories. By examining the frequency and presence of such facilities, the study seeks to formulate effective strategies to enhance safety standards in the plastic sector and protect workers and assets.

The data Table 10 presents a comprehensive overview of the level of fire safety practices in plastic factories. It reveals that a significant portion, approximately 52 per cent, of the factory's stairs do not open to the roof, while only 48 per cent do. In case of emergency, this can result in more casualties. Furthermore, the fact that around 64 per cent of factories have not allowed workers' access to the roof further emphasises that in case of any fire/accident, workers working in multi-storied buildings would find it difficult to exit.

**Table 10: Levels of Fire Safety Practices**

Factory type	Factory stairs open to the roof (per cent)		Worker has access to the roof (per cent)	
	Yes	No	Yes	No
Micro	40.0	60.0	15.0	85.0
Small	45.0	55.0	5.0	95.0
Medium	62.5	37.5	12.5	87.5
Large	100.0	0.0	100.0	0.0
<b>Total</b>	<b>48.0</b>	<b>52.0</b>	<b>36.0</b>	<b>64.0</b>

Source: CPD Plastic Sector Survey, 2023.

Regarding other firefighting facilities (Table 11), while some factories have essential safety measures in place, such as a documented fire safety plan (42 per cent), installed fire hydrant systems (14 per cent), and a round-the-clock safety officer (46 per cent), there are evident gaps in the availability of other critical facilities like pillar hydrants and sprinklers, which are present in only 4 per cent of factories. Given that this equipment is expensive to install, and most plastic factories are smaller compared to other industries, this highlights the need for a more comprehensive approach to fire safety infrastructure to respond to potential fire emergencies effectively. Otherwise, the major portion of the industry will be deprived of high technological advances.

**Table 11: Presence of Firefighting Facilities on Factory Premises**

*(in per cent)*

Firefighting facilities	Micro	Small	Medium	Large	Total
A documented fire safety plan	25.0	45.0	62.5	100.0	42.0
Installed Fire hydrant system	5.0	0.0	50.0	100.0	14.0
Hosepipes/hose reels on every floor	10.0	5.0	50.0	100.0	18.0
Risers	0.0	0.0	0.0	100.0	4.0
An auto-transfer system for hydrants and pumps	0.0	5.0	25.0	100.0	10.0
Pillar hydrants	0.0	0.0	0.0	100.0	4.0
Sprinklers	0.0	0.0	0.0	100.0	4.0
Repeater control panels, annunciator, key switches, indicator monitors	0.0	0.0	12.5	100.0	6.0
A round-the-clock safety officer	35.0	35.0	87.5	100.0	46.0
Smoke detectors and heat detectors or multi-detectors	10.0	5.0	50.0	100.0	18.0
Fire alarm systems	20.0	20.0	75.0	100.0	32.0
Emergency lights and exit signage	15.0	35.0	25.0	100.0	28.0
Fireproof decoration/false ceiling	0.0	5.0	12.5	100.0	8.0
Ducts/wall holes sealed by fireproof material/fire stoppers	5.0	5.0	0.0	100.0	8.0
Easily accessible emergency exit stairs	15.0	20.0	37.5	100.0	24.0
Underground water reservoir	15.0	45.0	25.0	100.0	32.0
Fire equipment and fire extinguishers	60.0	95.0	87.5	100.0	80.0
Personal Protective Equipment (PPEs) for each worker	0.0	15.0	62.5	0.0	16.0

**Source:** CPD Plastic Sector Survey, 2023.

In addition to having proper structural safety facilities, it is important to consider fire safety practices. According to the data (Table 12), it is commendable that 72 per cent of the factories conduct annual firefighting drills and 8 per cent conduct monthly drills. However, the fact that

20 per cent of factories, as high as one-fifth of all enterprises do not practice any fire drills. This share is high for micro-enterprises (45 per cent) who do not conduct drills at which all, signifies a concerning aspect that requires immediate attention. Regular and well-executed firefighting drills are vital to ensure workers are adequately prepared and aware of the appropriate safety protocols during emergencies.

**Table 12: Frequency of Fire Drill Training**

Size	Monthly	Yearly	None
Micro	0	55	45
Small	0	95	5
Medium	25	75	0
Large	100	0	0
Overall	8	72	20

**Source:** CPD Plastic Sector Survey, 2023.

The following table 13 highlights the types of chemicals used in the factories, with 30 per cent involving flammable gases, which raises valid concerns about potential fire risks associated with their storage and handling. The highest use of chemicals includes Calcium Carbide (12 per cent), Ammonium Nitrate (8 per cent), and Petroleum (4 per cent). These chemicals used by the factories can result in skin burns, eye sores, or severe physical damage if the chemicals are mishandled. Hence, the result calls for specific guidelines for storage protocols and handling procedures for chemicals to minimise the risk of fire incidents in these facilities.

**Table 13: Chemicals Used in Plastic Sector**

Chemicals	Micro	Small	Medium	Large	Overall
Ammonium Nitrate (NH <sub>4</sub> NO <sub>3</sub> )	5	15	12.5	0	8
Calcium Carbide (CaC <sub>2</sub> )	5	15	12.5	50	12
Petroleum	10	0	0	0	4
Flammable Liquid Chemicals	10	5	0	0	6
Gases (Liquefied Petroleum Gas (LPG), Oxygen, Natural Gas, Ammonia, Nitrogen Carbon dioxide (CO <sub>2</sub> ), Helium, Argon)	10	40	50	50	30

**Source:** CPD Plastic Sector Survey, 2023.

But it is a matter of concern that in inspection, apart from the chemicals mentioned in Table 13, no other raw materials are checked. Therefore, the frequently used raw materials in plastics such as Polyethylene (PE), Polypropylene (PP), Polyvinyl Chloride (PVC), PVC Resin, Polystyrene (PS), Polyethylene Terephthalate (PET), Polyurethane (PU), Polycarbonate (PC), Acrylonitrile Butadiene Styrene (ABS), Polyamide (Nylon), Additives and Fillers, Stabilisers (e.g., UV stabilisers, heat stabilisers), Flame Retardants, Colourants and Pigments, Antioxidants, Masterbatches, etc. are not included in the list. Many of these chemicals and raw materials used in the plastic industries can pose dangers, especially if mishandled or improperly stored. Potential risks include

chemical exposure, inhalation of toxic fumes, skin contact, and fire hazards. Plastic additives, such as plasticisers, stabilisers, and flame retardants, can introduce toxicity and other hazards depending on their chemical composition. Some plastics release hazardous gases when burned, which can contribute to further damage if a fire incident takes place.

**6.2. Level of electrical safety practices:** Electrical safety practices in plastic factories are critical to examine the potential risks associated with electrical hazards in industrial settings. This section focuses on assessing the adequacy and effectiveness of electrical safety measures implemented in plastic factories to safeguard workers and the overall workplace. The data provides valuable insights into understanding the current state of electrical safety practices, thus will help to identify areas that require improvement and establish best practices to mitigate electrical risks.

The following data table 14 provides insights into the electrical safety measures adopted by plastic factories, focusing on separating the generator and electrical substation equipment.

**Table 14: Level of Electrical Safety Status**

The generator is separated by:	Per cent	The electrical substation and substation equipment are separated by:	Per cent
2-hour fire-rated wall with earthing	20	4-hour fireproof walls	14
3-hour fire-rated wall without earthing	4	3-hour fireproof walls	8
4-hour fire-rated wall with earthing	4	2-hour fireproof walls	4

**Source:** CPD Plastic Sector Survey, 2023.

For the generator, 20 per cent of factories have it separated by a 2-hour fire-rated wall with earthing, while 4 per cent have a 3-hour fire-rated wall without earthing, and only 4 per cent have a 4-hour fire-rated wall with earthing as per the Fire Prevention and Extinction Act 2003. These differences highlight the existence of asymmetric information in understanding safety protocols and differentiated awareness levels regarding legal and regulatory bindings.

Regarding the presence of electrical safety facilities in factories, it has been observed that 32 per cent of them have instructions posted in Bengali and English languages for the rescue of electrocuted individuals. These instructions are placed in easily visible locations where electricity is used. Additionally, a significant percentage of factories (58 per cent) have cut-outs, circuit breaker circuits, and devices arranged to prevent charging shocks, while 66 per cent have an earthing system, which is crucial for ensuring electrical safety. On the contrary, only 30 per cent of the factories have metal coverings for joint boxes, fuse covers, and lamp holders. About 34 per cent of factories have a plate displaying the message 'Dangerous' in both Bengali and English languages on every generator and motor for effectively alerting workers to potential hazards. About 34 per cent of factories maintain a three-foot-wide space in front of the main switchboard, allowing safe access for maintenance and operation. About 26 per cent of factories have ensured frames or base plates of generators, transformers, switchgear, and motors, enhancing stability and safety during operations contributing to potential electrical accidents. Overall, Table 15 indicates electrical security is in a weak state in plastic factories.



**Table 15: Presence of Electrical Safety Facilities Status on Factory Premises***(in per cent)*

Electrical safety facilities	Micro	Small	Medium	Large	Overall
Instructions in Bengali and English posted for the recovery of electrocuted persons in an easily visible place where electricity is used	10	35	63	100	32
Cut-outs, circuit breaker circuits and devices arranged to prevent charging shock	35	70	88	50	58
Frames or base plates of generators, transformers, switchgear, and motors	15	15	63	100	26
Metal coverings of joint boxes, fuse covers, lamp holders	35	20	38	50	30
Earthing system	65	60	75	100	66
A plate with the message 'Dangerous' in Bengali and 'Dangerous' in English is permanently displayed on every generator and motor	15	45	38	100	34
Three-foot wide space in front of the main switchboard	25	30	50	100	34

**Source:** CPD Plastic Sector Survey, 2023.

The data reflects interesting findings that according to the cost-cutting theory of safety measures, most enterprises should have metal coverings of joint boxes, fuse covers, and lamp holders as they are the least expensive settings among the other electrical safety equipment. But the cheapest option having a comparatively lower percentage compared to other options may suggest that OSH initiatives rely heavily on habitual practices. It also indicates that lack of awareness is a major barrier to creating a culture of OSH, rather than the cost of OSH equipment itself.

**6.3. Level of structural safety practices:** Structural safety in plastic factories highlights vital aspects of structural safety, exploring key elements such as gas pipeline compliance, protection of dangerous machine parts, and required OSH facilities. Enhancing structural safety in plastic factories is a serious concern, given the potential risks associated with building integrity and the safe operation of machines and equipment within these industrial settings. The following data tables provide valuable insights into the current state of structural safety measures implemented in plastic factories.

In the following Table 16, it has been discovered that merely 10 per cent of factories have laid gas pipelines underground as per Bangladesh Gas Distribution Rules 2014, whereas a vast majority of 78 per cent of factories have not laid down the gas pipeline as per the regulations. An additional

12 per cent are unsure or do not know about the layout of gas pipelines. This data highlights the lack of adherence to gas pipeline safety regulations, which may pose significant risks of gas leaks and potential accidents.

**Table 16: Factories Having Gas Pipelines Laid Underground as Per Gas Pipeline Regulations**

*(in per cent)*

Size	Yes	No	Not sure
Micro	5.0	90.0	5.0
Small	15.0	60.0	25.0
Medium	12.5	35.0	0.0
Large	100.0	0.0	0.0
<b>Total</b>	<b>14.0</b>	<b>74.0</b>	<b>12.0</b>

Source: CPD Plastic Sector Survey, 2023.

Table 17 focuses on protecting dangerous machine parts and rotary converters. Only 18 per cent of factories have fireproof walls surrounding these parts, while 28 per cent rely on strongly constructed safeguards during operation. However, the majority, 54 per cent, are unsure or do not know about the protective measures in place. This indicates a lack of clarity and implementation of appropriate safety measures, potentially leading to increased risks of accidents and injuries to workers.

**Table 17: Status of Factories on Dangerous Parts of Machines and Equipment and All Parts of Rotary Converters are Surrounded**

Size	Fireproof wall	Strongly constructed safeguards	Not sure/ Do not know
Micro	5	25	70
Small	15	20	65
Medium	50	20	0
Large	50	5	0
Overall	18	28	54

Source: CPD Plastic Sector Survey, 2023.

The next table examines the presence of structural OSH facilities (Table 18). While 82 per cent of factories have a safe drinking water system for workers, the percentage drops significantly for other essential facilities such as regular hydraulic tests (12 per cent), an experienced boiler operator (20 per cent), and a storehouse constructed/planted as per approved design by the Explosives Authority (6 per cent). The low presence of such components can compromise workers' safety and operational efficiency in the event of emergencies.

**Table 18: Structural OSH Facilities Status**

Items	Micro	Small	Medium	Large	Overall
Regular hydraulic test	5	15	13	100	14
An experienced boiler operator	10	35	13	100	24
A storehouse constructed/ planted in the proper position as per the approved design of the Explosives Authority	0	5	25	100	10
Safe Drinking Water System for Workers	70	95	88	100	84

Source: CPD Plastic Sector Survey, 2023.

Finally, Table 19 analyses the frequency of specific safety initiatives. Notably, every safety test and training has unsatisfactory results as many factories have never taken these measures. Mishandling of storage is one of the primary causes of fire incidents in factories. However, 42 per cent of factories have not provided any training to their officials regarding the storage, transportation, and transfer of hazardous substances. This lack of tests and training can lead to mishandling and improper storage of hazardous materials, increasing the risk of accidents and chemical exposure.

**Table 19: Frequency of Safety Tests**

How frequently the following are tested or initiated:	Weekly (per cent)	Monthly (per cent)	Yearly (per cent)	None (per cent)	Total
Boiler manhole, mudhole, front door, and backdoor gaskets to determine whether they are leakproof	14	20	2	64	100
Hydraulic test and documentation of the water used in the boiler in logbooks	16	12	4	68	100
Safety valve settings pressure test	18	14	0	68	100
Water softener test (chemical, resin, dosing pump, etc.)	16	12	2	70	100
Training given to the concerned officials about the storage, transportation and transfer of the substances mentioned as per Material Safety Data Sheets (MSDS) and hazardous properties and safe handling	0	14	44	42	100

Source: CPD Plastic Sector Survey, 2023.

## 7. Compliance Status with Legal Provisions

In order to ensure a safe and responsible workplace, it is essential to evaluate compliance with legal requirements and safety regulations within the plastic industry. This includes assessing adherence to various legal provisions, which is crucial for promoting worker well-being and supporting sustainable growth in plastic factories. In this context, this section explores the presence of essential certificates, permits, and safety standards mandated by regulatory authorities.

To avoid industrial accidents, it is crucial for enterprises to have all the necessary certifications covering the required areas. These certifications often require renewal after a certain period of inspection. By regularly initiating the renewal process and conducting proper inspections, factories can ensure compliance and reduce the risk of accidents. Table 20 provides the percentage of factories possessing different certificates and permits mandated by local government authorities and regulatory bodies. Notably, 90 per cent of factories have obtained a license or permit from the Directorate of Fire Service and Civil Defense, whereas most of the industrial accidents are related to fire. The compliance rates for other certificates vary, with some certificates, such as a license from the Department of Drug Administration and the Boiler Operator Certificate from the Office of the Chief Boiler Inspector, being held by only 4 per cent of factories. This indicates weakness in legal enforcement, and lack of monitoring.

**Table 20: Status of Safety-related Certificate Availability**

*(in per cent)*

Certificate title	Micro	Small	Medium	Large	Overall
Trade License/No Objection Letter from Local Government Authorities	85	65	88	100	78
License/Permit from Directorate of Fire Service and Civil Defence	75	100	100	100	90
Electrical Approvals from the Office of the Chief Electricity Inspector	70	70	75	100	72
Electrical Test Certificate from the Electricity Supply Company	55	60	88	100	64
Electrical Test Certificate from Government-approved Electrical Contractors	30	50	63	100	46
Conditional Clearance from the Department of Environment	20	55	50	100	42
Environmental Clearance from the Department of Environment	10	45	25	100	30
Permit from the Department of Explosives	5	5	38	100	14

*(Table 20 contd.)*

(Table 20 contd.)

Certificate title	Micro	Small	Medium	Large	Overall
Permission/ License/ No Objection Letter from the District Administration	30	45	50	0	38
Contract from the Gas distribution company	0	15	13	0	8
Permit from the Department of Energy and Mineral Resources	0	10	25	50	10
License from Bangladesh Energy Regulatory Commission	10	20	38	100	22
Agreement/authorisation from Bangladesh Petroleum Corporation	5	0	25	100	10
License from Directorate of Inspection of Factories and Establishments	60	45	100	100	62

Source: CPD Plastic Sector Survey, 2023.

Table 21 highlights the responses regarding the awareness of a National Plan of Action on OSH and the existence of a written OSH policy. It reveals that only 16 per cent of workers are aware of the National Plan of Action on OSH, while a majority of 84 per cent are unaware. Additionally, a concerning 74 per cent of factories lack a written OSH policy. The absence of such documents and related knowledge may lead to a less structured and comprehensive approach to ensuring workplace safety which varies among factories.

**Table 21: Availability of Written OSH Policy**

(in per cent)

Size	Have written OSH Policy (in per cent)		Aware of a National Plan of Action on OSH (in per cent)	
	Yes	No	Yes	No
Micro	5	95	10	90
Small	5	95	25	75
Medium	50	50	50	50
Large	100	0	100	0
<b>Total</b>	<b>16</b>	<b>84</b>	<b>26</b>	<b>74</b>

Source: CPD Plastic Sector Survey, 2023.

Table 22 focuses on international safety certificates held by the factories. While some certificates, such as ISO 14001, are obtained by 14 per cent of factories, whereas no factory is having certificates like WRAP and EuPC. Of the factories, 84 per cent do not have any of the mentioned certifications. This further validates that the plastic sector faces less pressure regarding safety compliance compared to the RMG sector. However, given the increasing export trend of this

sector, the discrepancy may suggest a need for more widespread adoption and recognition of international safety standards to further enhance safety practices in the plastic industry.

**Table 22: Availability of International Safety Certificates**

International certificates related to safety	Frequency	Per cent
ISO 14001	7	14
BSCI	6	12
WRAP	0	0
SMETA	1	2
EuPC	0	0
Cefic-FCA, 2011	5	10
None	42	84
Not sure/ Do not know	0	0
<b>Total</b>	<b>61</b>	<b>100</b>

Source: CPD Plastic Sector Survey, 2023.

Lastly, Table 23, on the existence of safety committees, shows that out of factories (with 51–300 workers), 5 have safety committees, while the other 2 factories do not. However, the two factories (with more than 500 workers) have safety committees. Safety committees can be crucial in promoting a safety culture and effective communication within the workforce. However, it is evident that for small and micro-factories forming a safety committee is not feasible unless a specific industrial zone is created to accumulate the small and micro-factories in one place.

**Table 23: Availability of Safety Committee Based on Worker Distribution**

Factory size	Yes	No	Total
Large	100	0	100
Medium	62.5	25	87.5
Micro	Not Applicable		
Small			

Source: CPD Plastic Sector Survey, 2023.

## 8. Review of Accidents and Injury Incidents in Surveyed Factories

This section dives into the occurrence of accident and injury incidents over the last five years to portray the accident and injury scenario and compare other relevant indicators that can provide valuable insights into effective safety measures and potential areas of improvement within the plastic factories.

Table 24 illustrates the number of industrial accidents reported in the last five years. Twenty-one factories faced one to five cases of industrial accidents, 18 factories faced 6–10 accidents,

1 factory faced 11–15 accidents, 2 factories faced 16-20 accidents, and 1 factory faced 21–25 accidents during last five years. Table 24 also reflects there have been 27 fatal or non-fatal injuries in total in the last five years. The number of accidents and injuries in the last five years validates the concern regarding this sector and puts emphasis on the need for major regulatory reform to enhance OSH practices in factory premises.

**Table 24: Frequency of Industrial Accidents and Injury in Last Five Years**

Size	1–5		6–10		11–15		16–20		21–25	
	Accidents	Injury	Accidents	Injury	Accidents	Injury	Accidents	Injury	Accidents	Injury
Micro	10	7	9	1	1	0	0	-	0	-
Small	10	11	8	2	0	0	1	-	0	-
Medium	1	3	1	1	0	0	0	-	0	-
Large	0	0	0	1	0	1	1	-	1	-
<b>Total</b>	<b>21</b>	<b>21</b>	<b>18</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>-</b>	<b>1</b>	<b>-</b>

Source: CPD Plastic Sector Survey, 2023.

In addition, Table 25 shows factories without designated OSH personnel had a higher number of accidents. Over the last five years, 36 accidents and 20 injuries were reported in the factories which do not have any assigned OSH person.

**Table 25: Impact of Having an OSH Person on the Number of Accidents & Injury in the Last Five Years**

Have designated OSH person	Number of accidents	Number of injuries (Fatal & Non-fatal)
Yes	7	7
No	36	20
<b>Total</b>	<b>43</b>	<b>27</b>

Source: CPD Plastic Sector Survey, 2023.

The trend indicates that having designated OSH personnel allows factories to prioritise safety measures, implement preventive strategies, and respond promptly to incidents, reducing the likelihood of accidents and injuries. On the contrary, factories without designated OSH personnel may lack proper safety protocols, leading to a higher number of incidents and potential worker injuries. This also highlights the importance of having designated OSH personnel in place to enhance workplace safety, protect workers’ well-being, and minimise the occurrence of accidents and injuries in surveyed factories.

## 9. OSH Hazards in the Plastic Sector: Workers' Perception

Understanding OSH practices at the factory level is vital for creating a secure and conducive working environment that prioritises employee well-being and fosters a culture of safety and responsibility. Exploring workers' experiences with various workplace hazards, responses to accidents or injuries, and their perceptions of the factory's safety status helps identify the areas for improvement, potential risks, and effective strategies to bolster workplace safety.

Table 26 provides valuable insights into the OSH practices at the factory level, encompassing workers' experiences with various hazards, responses to accidents or injuries, and their perceptions of the factory's safety status. It presents the percentage of workers who suffer from different hazards in the workplace. It also highlights a significant number of workers face challenging working conditions, with a staggering 99 per cent enduring extreme heat, and 80 per cent experiencing draughts. Additionally, 69 per cent of workers face discomfort due to temperature changes, while 45 per cent reported lacking fresh air. Female workers assigned higher concerns on chemical hazards, dust, smoke, changing temperature, and lack of light.

**Table 26: Workers' Perspective on the Factory Environment**

Workers suffer from:	Male	Female	Overall
The cold	12.3	11.1	12.0
The heat	98.6	100.0	99.0
The changes in temperature	64.4	81.5	69.0
The draught	84.9	66.7	80.0
The lack of fresh air	43.8	48.1	45.0
The low light/ lack of lighting	32.9	48.1	37.0
The stench	30.1	37.0	32.0
The dust	4.1	11.1	6.0
The smoke	8.2	14.8	10.0
Chemical hazards like leakage, vapour, gas, emissions	19.2	40.7	25.0
Noise	31.5	33.3	32.0

**Source:** CPD Plastic Sector Survey, 2023.

Working modality and negative environmental impact can result in severe damage in the long run if not taken into consideration. Table 27 sheds light on these areas of concern based on worker feedback in various aspects of workplace safety, including factory environment, carrying, and lifting loads, repetitive strain injuries, and poor posture.

Table 27 highlights worker interaction with hazardous substances. A significant percentage of workers i.e., 63 per cent stated they encounter noise levels requiring them to raise their voice when talking to someone less than a metre away. Prolonged exposure to excessive noise can lead to hearing impairment and other health issues. Approximately 21 per cent of workers reported performing manual lifting, carrying, or pushing heavy items throughout the day regularly,



**Table 27: Perception of Workers on Working Modality**

Perception of workers	Regularly	Weekly	Monthly	Rarely	Total
Workers interact with hazardous substances such as chemicals, flammable liquids, and gases (in percentages)	10	5	0	85	100
Manually lift, carry or push items heavier than 20 kg at least 10 times during the day (in percentages)	21	20	11	48	100
Noise levels that are so high that you have to raise your voice when talking to people less than one metre away (in percentages)	63	11	6	20	100
Sit for more than 2 hours in a row (In percentages)	35	28	6	31	100
Stand for more than 2 hours in a row (In percentages)	69	12	3	16	100

**Source:** CPD Plastic Sector Survey, 2023.

which could contribute to repetitive strain injuries and musculoskeletal disorders. The data indicates a significant number of workers regularly experience these issues, which can lead to discomfort, reduced productivity, and long-term diseases. More importantly, being affected by this environment, one can easily fall sick while working and cause workplace injury and accidents. Most workers are not aware of or cannot practice safety protocols when an accident takes place in the workplace. In the majority of cases, workers either verbally report to the management persons or do not report. Only a few factories have designated persons to report accidents.

**Table 28: Reporting Mechanism of Accidents, Injury, and Disease**

Reporting mechanism	Per cent
In paper, through dedicated human resource/Use BLA form	13
Verbally to the management body	46
Does not report	41

**Source:** CPD Plastic Sector Survey, 2023.

Table 29 assesses the support provided to injured workers in the event of these accidents or injuries in the workplace. Notably, 74 per cent of factories offer free medical attention to injured workers, and 60 per cent provide paid sick leave for severe injuries. However, 23 per cent of factories only offer unpaid sick leave, which could potentially discourage workers from reporting injuries promptly, leading to underreporting and hampering overall safety efforts.

Considering the recent growth, table 30 explores workers' perceptions of the factory's safety status. Encouragingly, 68 per cent of workers feel that the factory's safety has improved, indicating

positive changes in OSH practices. However, 7 per cent still feel unsafe, and 25 per cent believe safety remains the same, highlighting the need for continued efforts to enhance safety protocols and address workers' concerns.

**Table 29: Facilities for Injured Workers**

If any accident/ injury takes place while working, which of the following(s) are offered to the injured worker	Per cent
Free medical attention	74
Get paid sick leave if the injury is severe	60
Get unpaid sick leave	23

Source: CPD Plastic Sector Survey, 2023.

**Table 30: Perception of Workers Regarding the Factory's Safety Status**

Response	Per cent	Per cent
Improved; I feel safer now	68	68
Same: I feel safe as in the past	25	25
Same: I feel unsafe as in the past	7	7
<b>Total</b>	<b>100</b>	<b>100</b>

Source: CPD Plastic Sector Survey, 2023.

Lastly, Table 31 presents workers' perceptions about their knowledge of workplace health and safety. While the majority of workers feel clear about their rights and responsibilities (53 per cent), a smaller percentage (33 per cent) feel the same about their employers' responsibilities. Enhancing education and training and creating awareness of workplace health and safety can empower workers to actively participate in maintaining a safe work environment and effectively respond to health and safety concerns.

**Table 31: Workers' Perception of Their Rights and Responsibilities**

Workers' perception	Positive response (in per cent)
I am clear about my rights and responsibilities in relation to workplace health and safety	53
I am clear about my employers' rights and responsibilities in relation to workplace health and safety	33
I know how to perform my job in a safe manner	72
I have the knowledge to assist in responding to any health and safety concerns at my workplace	20
I know what the necessary precautions are that I should take while doing my job	77

Source: CPD Plastic Sector Survey, 2023.

## 10. Role of Public and Private Organisations in Implementing OSH Compliances on the Factory Level

**A. Public monitoring and inspections:** Apart from employers and workers, regulatory bodies play an active role in fostering OSH culture. Table 32 highlights the number of inspections conducted by the DIFE in the last five years across different locations. The data reveals that Dhaka has undergone the highest number of inspections (24), followed by Gazipur (9) and Narayanganj (5). This disparity in inspection frequency may indicate potential challenges in resource allocation and the need for better coverage across all locations. Ensuring consistent and thorough inspections can play a crucial role in promptly detecting and addressing safety violations, thereby improving overall compliance.

**Table 32: Frequency of Inspection by DIFE in the Last Five Years Based on Location**

Location	1-5	6-10	11-15	16-20
Dhaka	6	5	9	4
Gazipur	0	5	1	3
Narayanganj	1	4	0	0
<b>Total</b>	<b>7</b>	<b>14</b>	<b>10</b>	<b>7</b>

Source: CPD Plastic Sector Survey, 2023.

When inspections are classified by factory size (table 32), some interesting findings emerge. In larger factories, inspections occur more frequently, with a range of 16–20 in the last five years. On the other hand, in micro-factories, inspections are less frequent, with a range of only 1–5. This may suggest that the safety standards are not upheld uniformly across the sector. On the other hand, 24 per cent of factories have not faced any inspection in the last five years at all.

**Table 33: Frequency of Inspection by DIFE in the Last Five Years Based on Factory Size**

Type	1-5	6-10	11-15	16-20	Total inspection	No inspection
Micro	7	5	4	0	16	4
Small	0	8	5	5	18	2
Medium	0	1	1	1	3	5
Large	0	0	0	1	1	1
<b>Total</b>	<b>7</b>	<b>14</b>	<b>10</b>	<b>7</b>	<b>38</b>	<b>12</b>

Source: CPD Plastic Sector Survey, 2023.

Encouraging and enforcing the reporting of accidents is critical for promoting a safety-conscious culture and improving overall safety practices. Table 34 highlights the authority to whom accident-related statistics are reported. Alarming, a significant portion of accidents (30 per cent) are not reported to any authority. Failure to report accidents in such a way can hinder the identification

of root causes and the implementation of preventive measures, potentially leading to recurrent incidents and compromised safety.

**Table 34: Authorities to Report for Accident-related Information**

*(in per cent)*

Response	Micro	Small	Medium	Large
Factory headquarters	75	65	100	100
To DIFE	15	10	50	100
To FSCD	35	30	75	100
None	25	35	0	0

Source: CPD Plastic Sector Survey, 2023.

Table 35 explores the areas where apart from inspections, regulatory body provided support. While training for workers is the most supported area (54 per cent), there is room for increased emphasis on training for management (22 per cent) and inspection follow-up (26 per cent). Enhancing support in these areas can help strengthen management's commitment to safety and ensure that identified issues are effectively addressed and monitored.

**Table 35: Areas of Support Received by Factory from DIFE**

Response	Frequency	Per cent
Training for management	11	22
Technical guidance	9	18
Awareness and training for workers	27	54
Inspection follow up	13	26
None	18	36
Other (specify)	0	0
<b>Total</b>	<b>50</b>	<b>100</b>

Source: CPD Plastic Sector Survey, 2023.

**B. Private organisations interventions:** Employers' organisation and private authorities put a strong emphasis on awareness of workers and training for management. Table 36 highlights the areas of support received from these employers' organisations. This underscores the role of these organisations in promoting a culture of safety and ensuring that workers are well-informed about OSH practices.

Moreover, among the factories that export products reveal that a considerable portion (50 per cent) of clients, brands, or buyers audit factory sites and check OSH performance indicating that external stakeholders are actively engaged in monitoring OSH performance. However, there are also instances (33.33 per cent) where clients do not actively measure OSH performance, potentially leaving room for improvement in accountability and compliance.

**Table 36: Areas of Support Received from the Employers' Organisation**

Response	Micro	Small	Medium	Large
Credit support	0	10	0	0
Training for management	15	10	38	50
Technical guidance	0	20	50	100
Awareness and training for workers	35	65	75	100
None	25	25	25	0

Source: CPD Plastic Sector Survey, 2023.

**Table 37: Participation of Third-party Stakeholders in OSH Initiatives**

Response	Per cent
Most clients/Brand/Buyers audit sites and check OSH performance	50.00
Most clients/Brand/Buyers only ask for accident reports on site	16.67
Most clients/Brand/Buyers do not measure OSH performance	33.33
<b>Total</b>	<b>100.00</b>

Source: CPD Plastic Sector Survey, 2023.

## 11. Areas of Intervention to Improve OSH Standards Based on the Findings

The OSH in the plastic sector is not even at the level of national standard, let alone the international standard. This has caused major risks to workers, entrepreneurs, the sector and ultimately to the economy of the country.

The plastic sector has confronted four structural OSH related weaknesses— (1) Over-dominance of micro-small factories with poor compliance standards, (2) Prone to severe safety and health risks due to their locations in residential areas and multistoried rented spaces, (3) Over-focusing on domestic market with little pressure on compliance from buyers and consumers and (4) Lack of direct monitoring and surveillance of a large section of enterprises. The following set of recommendations offers strategic insights to eradicate the four major weaknesses and boost OSH standards within Bangladesh's plastic factory sector:

- a) **A five-to-ten-year strategic plan for the sustainable growth of this sector needs to be planned:** To improve OSH standards in the plastic industry and increase competitiveness in export markets, a 5–10-year strategic plan should be developed. This plan should consider global standards, sustainability, and involve collaboration with various players such as ministries, agencies, and workers' organisations. It should not only address product and market development, but also take into consideration various aspects such as OSH, environmental impact, circularity, global commitments, and post-graduation opportunities. By doing so, the plastic industry can become a compliant and sustainable export-oriented sector.
- b) **Immediate relocation of factories which are in residential areas and multi-storied buildings to a state-of-the-art industrial zone needs to be initiated:** The government should approve the relocation proposal for 1,200 factories in old Dhaka to reduce safety risks

of workers and the area. According to CPD, such a project will cost BDT 3,660 crore, with 10 *kathas* of land for each owner for building a two-storied (8,000 sq feet) structure. For small and micro enterprises, there should be an opportunity for repaying the cost in a period of 25 years. The Ministry of Finance should arrange funds for quick implementation, while the Ministry of Industries should guide the Bangladesh Small and Cottage Industries Corporation (BSCIC) to implement the project favourably.

- c) **DIFE should immediately set up a separate unit under its Industrial Safety Unit which may be called 'ISU-Plastic':** The inspection and monitoring should be regular and cover all factories concerned in all locations instead of some priority locations. ISU-Plastic should co-ordinate the frequency of inspections by specific agencies and inform the agencies accordingly. Quality of monitoring, inspection, and follow-up should maintain standard protocol, considering the safety and hazardous nature of materials used in the plastic sector. In addition to fire, electrical, and structural concerns, this safety protocol should include the storage of hazardous chemicals and flammable raw materials, the use of gas lines, earthing of pipes, and testing of different safety instruments and boilers. The DIFE should list all plastic factories and integrate all information into the LIMA database.
- d) **Active participation of employer organisations is needed:** According to the pattern of the RMG sector of Bangladesh, the compliance issues get greater acceptance when recommended by the leading organisations. Employers' organisations play a vital role as a connector between regulatory authorities and the owner of the factories. As most of the plastic factories are a member of the BPGMEA, the association should take leadership role in making the plastic sector the 'next RMG of Bangladesh'. In this context, it should develop a five-year-long strategic plan. The current plan may be upgraded focusing on sustainability and OSH issues. Initially, the BPGMEA can start by appointing an OSH officer and gradually expand its scope and coverage and set up an 'OSH unit' to better inform the members about safety-related issues. The BPGMEA should sign agreements with private service providers on fire, electrical and structural safety protocol expert agencies having exposure to work maintaining international standards. Such collaborations were found to be effective in the RMG sector. The Association should also revise its membership criteria by including safety-related issues as a prerequisite for new membership. Renewal of membership should be based on the newly added safety requirements.
- e) **National and international organisations should collaborate to expand the remediation measures towards plastic sector:** Collaboration with international organisations such as International Labour Organization (ILO) could take a major initiative in helping the plastic sector as part of its intervention beyond the RMG sector on improving occupational safety and health. The BPGMEA can take the lead and collaborate with the ILO to develop a three-year partnership programme targeting OSH-related issues highlighting better monitoring, strengthening capacity building, awareness raising of the management and workers, setting safety committees, and maintaining safety protocols. Moreover, the ILO can also focus on gender-related aspects, workers' safety and work modality issues can be better handled through the Better Work Bangladesh Programme on a pilot basis.

Lastly, improving OSH conditions in any industry requires a blend of prevention, protection, and mitigating measures. In Bangladesh, the legislation part of ensuring safety is well developed that includes preventive, protection, and mitigation rules. However, ensuring safety at the factory level requires habitual practices. Hence, the recommendations outlined and included establishing dedicated manufacturing zones, shifting micro-factories to permanent zones at subsidised costs, a well-balanced inspection approach, collaboration with private OSH organisations, and sector-specific considerations plan of action are advocated. These strategies seek to foster stability, regulatory compliance, and a culture of OSH excellence, addressing the unique challenges faced by the plastic industry in Bangladesh while promoting workers' safety and sustainable practices.

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The plastic industry of Bangladesh constitutes 1 per cent of the GDP and generates USD 166.25 million in exports. However, the industry is grappling with significant Occupational Safety and Health (OSH) challenges, including structural issues, substandard conditions, and a reliance on complex machinery, resulting in workplace hazards like fire, chemical exposure, and electrical risks. The study reveals critical gaps in OSH practices, indicating the need for a comprehensive approach to address the unique challenges the sector is witnessing.



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