

# **Analysis of Availability of Fire Fighting Equipment in Selected Knitting Garment Factories in Bangladesh**

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## **Abstract**

Readymade garments are the most important export item from Bangladesh. Almost 4.4 million people are employed in this sector, yet the working conditions and fire safety records in the factories are often not up to the standard. Despite a number of initiatives to reduce fire accidents in the garment factories, there are still a significant number of fire occurrences in these factories. Data from 25 knitting garment factories have been collected by direct investigation. Data has been collected by survey based methodology. From the analysis it has been found that factories are running without maintaining safety equipment standard after several incidents. Highest mismatching hard parameter with standard is heat detector and highest matching hard parameter with standard is first aid box. Authorities need to be strict to minimize the losses of lives in garment factories due to fire incidents.

**Keywords** - Hard parameter, RMG, Fire safety.

## **I. INTRODUCTION**

Readymade garments are the largest export sector in Bangladesh, with more than 81.17% of the country's total foreign earnings generated from this sector. Bangladesh is also the second largest apparel exporter in the world with a total export of USD \$24.5 billion in the fiscal year 2013-14 [BGMEA (2012)]. The garment sector has enjoyed a significant growth in Bangladesh for the last three decades. From a humble beginning of 12 industries in 1978, the garment industry currently consist of 5,600 factories of various sizes, although around 3,500 are currently operating [ProthomAlo (2013)]. Almost all of the factories are distributed between two of the largest cities – Dhaka, the capital and Chittagong, with Dhaka hosting over 70% [ProthomAlo (2013)]. Since this is a highly labor intensive industry (hence Bangladesh's competitive advantage through its abundant supply unskilled cheap labor) the sector is also the largest industrial employer in the country with around 4.4 million people directly working in this factories [Wadud, H., Ahmed (2013)]. Inclusion of backward and forward linkages would further increase the number of employees dependent on this sector.

The readymade garment industry is a highly competitive industry and cost-saving is highly valued, but given the lack of a safety culture in the country in general, cost-cutting measures often affect the health and safety of the workers. Clothing is easily flammable and as such fire is one of the most frequent and damage inducing accidents in these factories in Bangladesh [Ahmed J, Hossain T (2009)]. Fire is also purported to be the largest cause of on-the-job injuries and fatalities in this sector. Each new incident of fire and related damage adversely affects the reputation of the industry abroad, especially since the working conditions in the manufacturing sectors in the developing countries is a general cause of concern in many developed countries [Ahmed J, Hossain T (2009)]. Given the importance of fire safety in the garment sector, there have been concerted efforts from the government, the industry lobby Bangladesh Garments Manufacturers and Exporters Associations (BGMEA) and the international buyers of the apparel products, to improve the fire safety culture and this has indeed reduced the fire incidents and losses significantly.

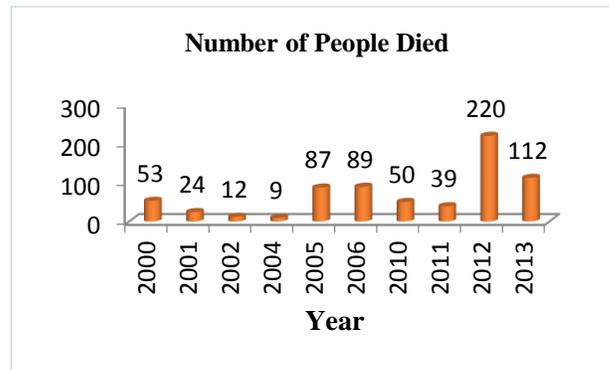


Figure 1: Numbers of deaths in year 2000-2013 in the RMG sector, Bangladesh [Ahmed J, Hossain T (2009), Over 500 RMG (2012)].

## II. OBJECTIVE

To find out availability of firefighting equipment in selected knitting garment factories.

## III. FIREFIGHTING EQUIPMENT

Firefighting equipment is used for firefighting by trained fire fighters, or a user at the scene of a fire. There are a number of different kinds of firefighting equipment available depending on the methods used, purpose, user and location. They also vary in types, capacity, size, quality, duration of intended use, type of fire risk involved, manual or automated and many other criteria. Firefighting equipment ranges from a fire fighters gear to fitted systems in a building to fire extinguishers and communication equipment of a wide variety [Wadud, H., Ahmed (2013)]. The major fire safety equipment used in knitting garment factories in Bangladesh are given below-

1. Fire Extinguisher
2. Fire Alarm
3. Fire Bucket
4. Fire Blanket
5. Fire Hose
6. First Aid kit
7. Emergency Light
8. Fire Musk
9. Announcement System
10. Smoke Detector
11. Width of stairs of exit door
12. Emergency fire exit
13. Fire drill
14. Fire trained employee

## IV. RESEARCH METHODS AND DATA

The word methodology can be defined as a set of methods used in a particular area of activity. Research Methodology is a way to systematically solve the research problems; it may be understood as a science of studying how research is done scientifically. It has been defined as “the systematic study of methods that are, can be or have been applied within a discipline”. Before exploring the research methodology options, the type of research should be identified, since the choice of methodology for the research follows naturally for the clear definition of the research. Research is an original contribution to the existing stock of knowledge making for its advancement [Arif M, Baidya U, Baruni A (2013)]. It is the pursuit of truth with the help of study, observation, comparison and experiment. Data of 25 knitting garment factories have been collected by direct investigation from those factories.

## V. DATA COLLECTION

In the absence of strict land use plans, the garment factories are spread throughout the Dhaka city, although there are a few clusters where the concentration is much higher. A total of 25 factories were inspected, which represent around 1.2% of all the garment factories in Dhaka. 11 of these are located in Gazipur region, while 8 are in Dhaka region, 2 factories located in Narayangang and 4 factories situated at Savar. This research has been conducted on a survey based method. A questionnaire has been prepared for collecting data and data has been collected from factories by direct observation as well as from compliance manager. Collected data has been tested on SPSS (Statistical Process for Social Science) and the result of Cronbach's Alpha value has been found 0.897. The value 0.897 represents good in term of data validity.

## VI. DATA ANALYSIS

Given the lack of information about the factories, number of employees has been used to represent the size of a factory. Worker's fire Safety related compliance standards in the sample factories were examined here (Figure – 2 to 10) from the perspective of hard parameter known as firefighting equipment.

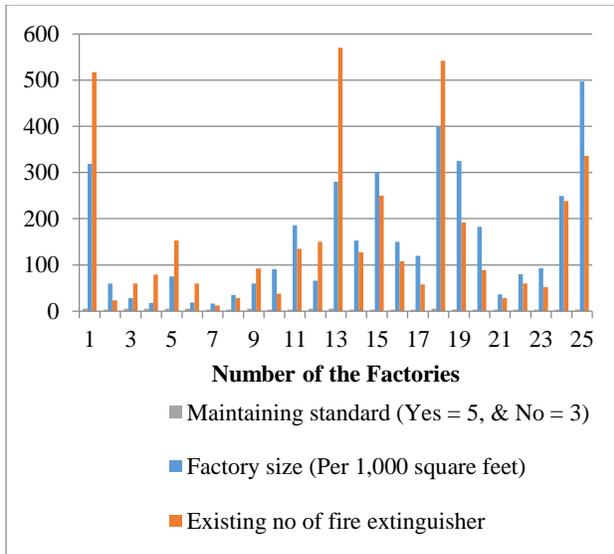


Figure 2: No. of Factories vs Factory size & Fire Extinguisher

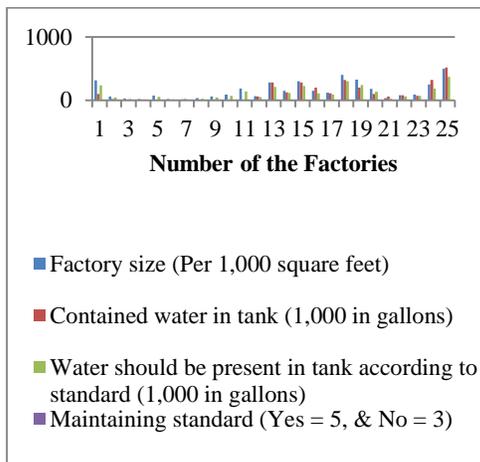


Figure 3: Number of Factories vs. Contained water

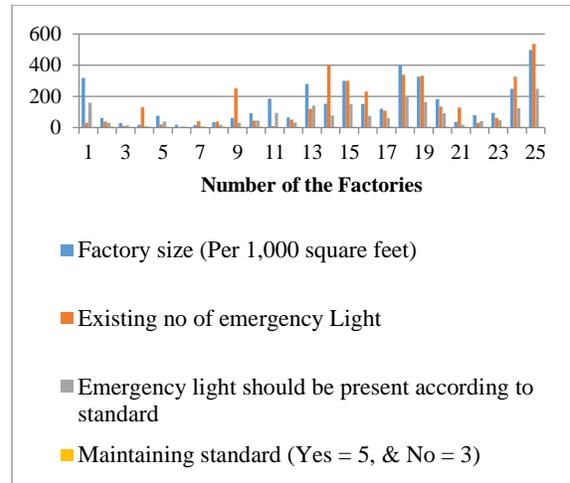


Figure 4: Number of Factories vs Emergency Light

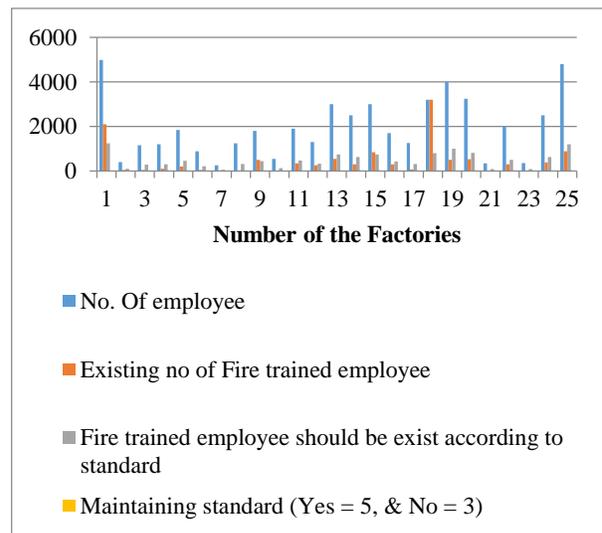


Figure 5: Number of Factories vs Fire Trained employee

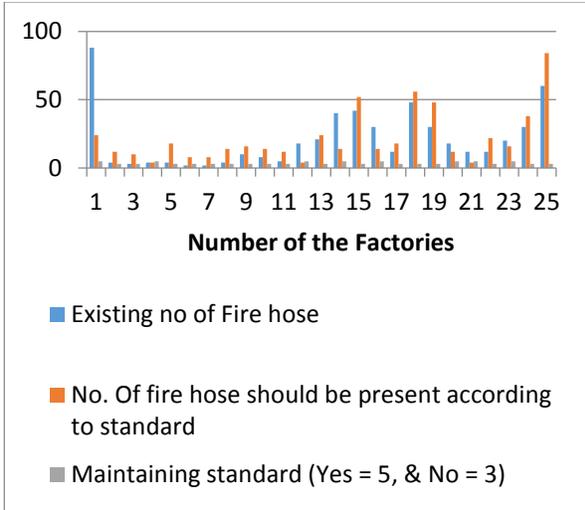


Figure 6: Number of Factories vs Fire Hose

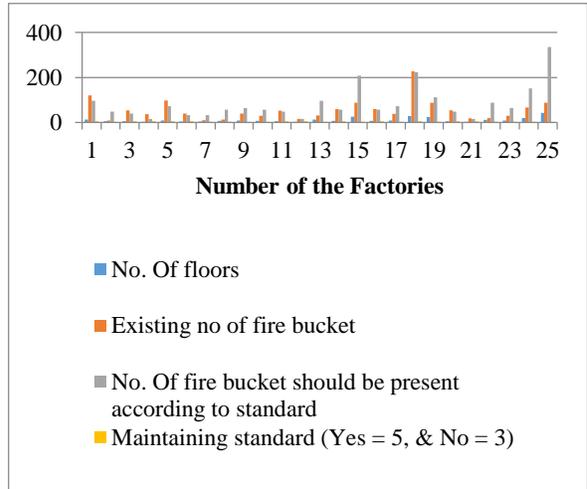


Figure 9: Number of Factories vs Fire Bucket

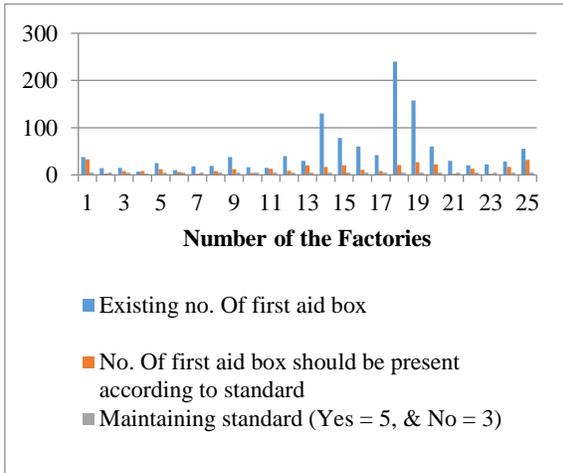


Figure 7: Number of Factories vs First Aid Box.

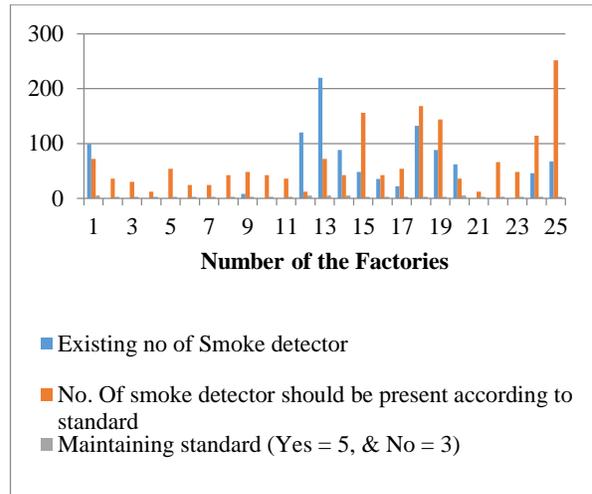


Figure 10: Number of Factories vs Smoke Detector

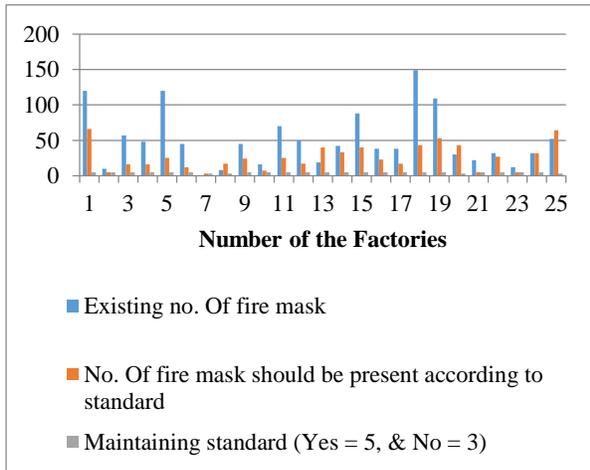


Figure 8: Number of Factories vs Fire Must

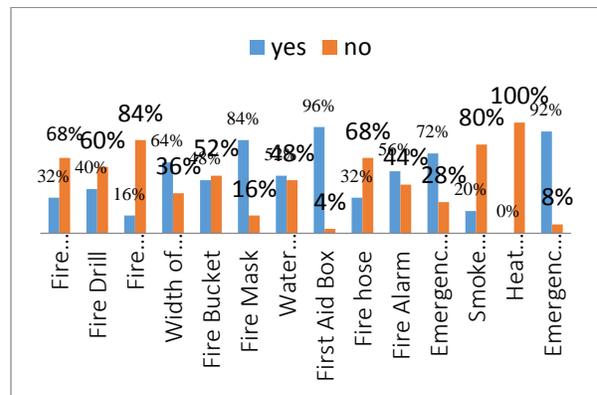


Figure 11: factories maintaining standard (hard parameter)

BGMEA (Bangladesh Garment Manufacturer and Export Association) has published the standard of maintaining firefighting equipment. Those are: fire extinguisher minimum 1 per 1000 square feet, at least 25% of workforce will be fire trained employee, at least 8 bucket should be at each floor, the number of first aid box should not be less than 1 per 150 worker, at least 2 fire hose in each floor connected with water tank, minimum of two control switches of fire alarm should be on each floor, fire drill should be at least once in a month, every factory should have 2 fire exit with 1.5 meter width staircase, at least 2 fire mask per 150 workers, at least 75000 gallons water in tank per 100000 square feet, minimum six smoke detectors in each floor (Distance from one smoke detector to another one must be 15 feet), minimum 50 emergency lights per 100000 square feet, minimum two heat detectors per floor [BGMEA (2012)].

Among 25 factories only 32 % factories maintain fire extinguisher standard, 68 % do not maintain their standard. Among 25 factories only 40 % factories maintain fire drill standard, 60 % do not maintain their standard. Among 25 factories only 16 % factories have fire trained employee according to standard, 84 % do not have their standard wise fire trained employee. Such like this figure 1 explains every detail about availability of firefighting equipment in 25 factories.

## VII. CONCLUSION

This research has been conducted on 25 knitting garment factories to measure the current condition of fire safety. It has been identified that most of the factories do not maintain standard firefighting equipment.

## VIII. ACKNOWLEDGEMENT

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