

# **GREEN GARMENT FACTORIES IN BANGLADESH: MOTIVATION AND CHALLENGES**

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## ABSTRACT

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<p>Abstract</p> <p>Bangladesh is the second top readymade garments (RMG) exporting country with the highest number of green RMG factories of the world. This sector comprises nearly 85% of the total exports and 11.2 % of the total GDP in the last year (2018-19) which has a huge impact on its socio-economic development, eventually considered as the main driver for sustainable development. Green garment industrialization is a bold demand from different stakeholders as well as a proper initiative to achieve sustainable industrial progress though it incurs huge investment on fixed cost and technical upliftment that may put the factories in challenges from both internal and external competition. This study aimed to find out the motivational factors and challenges towards green garment factories in Bangladesh. The qualitative research method was applied using a semi-structured questionnaire to interview 15 key informants from the mid to upper managerial level from Bangladeshi RMG factories. Besides, secondary sources e.g., reports, journals, books etc. was the basis for understanding this issue. The collected data has been transcribed and analyzed using qualitative content analysis. The findings suggest that garment owners are mainly motivated for green garment for environmental safety, safe working place, less energy consumption and factory reputation although there are many challenges including huge infrastructure cost, high maintenance cost and lack of financial support without any incentives or proper assurance from the government and buyers. The collective efforts from the producers, buyers, international agencies and government can make this sector green and sustainable.</p>	
Keywords: Green production, sustainability, LEED, barriers of a green garment factory, Bangladesh readymade garments factory, eco-friendly products	
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**LIST OF ABBREVIATIONS**

BGMEA – Bangladesh Garment Manufacturers and Exporters Association

BKMEA – Bangladesh Knitwear Manufacturers & Exporters Association

CSR – Corporate Social Responsibility

EPA – Environmental Protection Agency

ETP – Effluent Treatment Plant

EU – European Union

GDP – Gross Domestic Product

GSCM – Green Supply Chain Management

GSP – Generalized System of Preferences

IDCOL – Infrastructure Development Company Limited

ILO – International Labour Organization

LED – Light Emitting Diode

LEED – Leadership in Energy and Environmental Design

NGO – Non-Governmental Organization

OECD – Organisation for Economic Co-operation and Development

RMG – Readymade Garments

SD – Sustainable Development

UNIDO – United Nations Industrial Development Organization

USGB – US Green Building Council

UN – United Nations



# 1. INTRODUCTION

## 1.1 Background

The manufacture of Readymade Garments (RMG) is providing economic development to many developing countries in the world. The garment industry is important in both social and economic terms. Garment factories are providing jobs, incomes, and foreign revenue. In broad terms, the clothing industry is creating an opportunity for sustainable economic growth. Bangladesh has been experienced trajectory economic boost over the many decades and keeps on remaining admirably in front of many other developing countries in reducing poverty. According to the World Bank (2019), Bangladesh, right now a lower-middle-income nation, Bangladesh tries to become a middle-income country by 2021. Unfortunately, despite the country's outstanding economic growth, natural resources and environment have been ignored. This reflects the country's lower position in the global environmental performance index.

The history of RMG products exporting from Bangladesh began in the late 1970s. Over the three decades, Bangladesh became second to China in RMG exporting industry. Bangladesh has the highest number (90) of green garment factories in the world according to US Green Building Council (USGBC) whereas 24 green garment factories are platinum ranked leadership in energy and environmental design (LEED) green garments factories. In addition, about fifteen garments factory buildings possibly will get the LEED certification soon from the USGBC as they are very close to completing the construction. Approximately, 250 green garment factories appealed and are on the queue to receive the LEED certification (Mirdha, 2019b) which indicates how promising the RMG sector of Bangladesh is towards the green garments and sustainability.

The study perspective is directly related to Corporate Environmental Management and to Sustainable Development. The initial idea of this topic was formed during my studies at the University of Jyväskylä though the concept was an

integral part of my earlier social life. The importance of environment-friendly business practices is becoming a crucially important part of the textile industry. Environmental friendly business practices can enhance the sustainability of the garment sector. Recently, customers, government and buyers are more interested in corporate and socially responsible business. However, the stakeholders' initiative is mostly profit-centric. But business can achieve competitive advantage through green developments. During my studies, I have noticed that there is a substantial study gap regarding the current development of green garment factory in Bangladesh. Although, Bangladesh has most and top-ranked LEED certified green garment factories in the World. LEED certified building factories are more energy and resource efficient. The green factory generates low waste and ensures optimum use of water, energy and resources. However, there are various factors and challenges for green factory development in Bangladesh. These things insisted me to know the motivational factors behind green garment factory development and major challenges faced by RMG factory entrepreneurs.

## **1.2 Purpose of the study**

RMG manufacturing sector is a significant industry. Developing countries require more industries to reduce poverty and enhancing living standards. Garment industry provides jobs for millions of people across the world. Unfortunately, it includes several issues regarding the environment, economy and society. The manufacturing industry is responsible for a major part of the global consumption of natural resources and producing of waste. Around the world, the energy consumption of manufacturing sector increased by 61% from 1971 to 2004 (OECD, 2010). Garment manufacturing industry required huge water, large manpower and other resources. Green garment factory provides a healthy and safe working place, reducing environmental impact and bring factory reputation. Therefore, green factory initiatives will be the right path to overcome future threats.

Constructing a green garment factory is a new movement in Bangladesh. There are few published literatures available that address motivation and challenges for

green garment factories in Bangladesh. There are several reasons for conducting this research. Firstly, the Bangladesh garment industry is a key market player in the international RMG sector. The garment sector is the main driver of the country's economy. Furthermore, Bangladesh garment industry has a great impact on environmental pollution. Besides, remarkably, it provides job for millions of rural women. A green garment factory has many environmental and social benefits. A green factory reduces industrial pollution. Secondly, in recent years, the Bangladesh garment industry is facing many challenges like a safe working place, environmental issues and buyer's pressure. Stakeholders are influenced by the organization's activities, and that can impact on the profitability of the organization (Freeman, 1984; Donaldson and Preston, 1995). Thirdly, International cloth brands and government are seeking sustainable approaches for local garment industries. The question is if there are enough supports from the international buyers and government. This study helps to identify motivational factors behind green garment factory development and the major challenges for green factory implementation.

### **1.3 Research questions**

Bangladesh has now rapid growth of industrialization without proper attention to the environment. The role of business is changing, and Bangladesh's environmental pollution problem is being raised and complicated. Although, many businesses are still not confident and debating on green initiatives. Therefore, it is the proper time to understand key challenges and motivational issues for green garment factory development.

The main objectives originated from this following research questions are:

- What are the major motivating factors to develop green garment factory?
- What are the main challenges involved in developing green garment factory?
- What kinds of support are given from the buyers and government for the green garment factory?

#### **1.4 Research problems**

Even though the Bangladeshi RMG business has hugely contributed to overall economic development, but environmental problems are still considered as a major concern. Normally, garments manufacturing factories are utilizing various toxic chemicals, groundwater, and power for manufacturing and operation. From the earliest journey of RMG industrialization, Bangladesh has been using a high quantity of toxic chemicals and groundwater for washing and dyeing. A large number of the garment's factory couldn't efficiently utilize water in production. There was a shortage of knowledge and limited investment. It causes overuse of water. Moreover, wastewater treatment plants are very expensive for small garment factories. It was very common practices of throwing garments waste materials and toxic chemicals without proper treatment.

In the RMG sector, environmental safety issues are major concerns for entrepreneur and buyer. Environmental pollution and overuse of water are considered as a big threat to sustainability (Reza et al., 2017). Currently, buyers, stockholders, entrepreneurs are very aware of sustainability issues. Bangladesh textile sector needs to focus on cleaner production. Social compliance is another fundamental requirement for well-known western buyers. It is measured as one of the major challenges after the RanaPlaza and Tajrin tragedy. Social compliance issues are the most significant issues. Various international NGOs, Medias and international retailers are closely checking the safety standards and working environment of factories. In July 2013, labour law was transformed in Bangladesh. Bangladesh is keeping compliance standards with the International Labour Organization. Consequently, the implementation of recent labour law and orders in each factory is becoming an upcoming barrier. In the past, some factories were good in compliance while others were not. But there were more good sides than bad sides. But now the

picture has changed a lot, even the less compliant factories are trying hard to improve. (Mahmud et al., 2018).

Gradually, Bangladeshi garments entrepreneurs are realizing the harmful effects of industrialization on the environment. Entrepreneurs are worried about the adverse impact of the environment, climate change, social impacts and pollution. Bangladesh RMG factories have achieved remarkable development in sustainable manufacturing (Ahmed, 2019). Entrepreneurs are doing numerous things, for example, operating sewage treatment plants (ETPs), using renewable energy, installing energy effective technology to build the business environmentally friendly. In this case, green practice is one of the best effective methods for the garment's entrepreneurs.

Currently, green manufacture is getting popular to Bangladeshi RMG entrepreneurs where the making is cost-effective and environmentally friendly. Ex-president of Bangladesh Garment Manufacturers and Exporters Association (BGMEA) Md Siddiqur Rahman said that a silent industrial revolution happened in the Bangladeshi RMG sector (Newage, 2018). Reusing, recycling and reducing process can ensure energy savings, reducing environmental pollution, hazardous products and wastes. Currently, Bangladesh has ranked top position in green industrialization development. Bangladesh owned the maximum number of green RMG processing plants in the World (Mirdha, 2019b). There are various advantages from the green garment industry such as competitive advantages and environmental benefits. Green activity approaches focus on modernize industry as well as expanding efficiency in manufacturing without misusing resources and contamination.

### **1.5 Boundary of this research**

The objective of this study is to understand the motivation and challenges of green garment factories in Bangladesh. This research also presents insights for the government and buyers to promote green garment factory initiatives. This research is limited to Bangladesh RMG industry. The study focuses on the opinion of top and middle-level employees including factory owners. Most of the interview participants

are not decision-makers but they are inflectional employees of the factory. This study excludes geopolitical advice from the employees and respondents during data analysis.

## **1.6 Structure of this thesis**

This thesis consists of eight chapters, starting with the *introduction* and other chapters are as follows: chapter two illustrates *environmental awareness and RMG in Bangladesh* to provide an overview of the total scenario of this sector. Chapter three draws a *theoretical framework* with the previous literature by following brief history, current situation, industrial pollution, green production, green garment factories, advantages of a green factory, LEED Certification, difficulties in a green factory, environmental benefits, Bangladesh garment factories, clean production process. Chapter four explains *research methodology*; it includes the research approach, interviewee's selections, data collection, ethical challenges and data analysis. Chapter five presents the *empirical results and discussion*. In the next step, chapter six portrays *contributions* which followed by the chapter *conclusion*. Finally, chapter eight ended with the *evaluation of the research*.

## 2 ENVIRONMENTAL AWARENESS AND RMG IN BANGLADESH

Sustainable development and environmental awareness are two popular words in today's business. There is an increasing demand for eco-friendly products. Customers are more interested in products that have been made in an environmentally friendly process. This process decreases cost, improves productivity, resource efficiency, low carbon emissions and decreases any risk in the long run. At present stakeholders of various industries are directing businesses with the aim of an eco-friendly industry. For instance, international buyers of garment factories are very careful about the garment's product quality. Moreover, foreign buyers are also concerned about the ethical, social, and environmentally friendly standards (BKMEA, 2016; Reza et al., 2017). This environmentally friendly demand is also a pressure towards the developing countries like Bangladesh.

At present, the globe faces many environmental problems which have been treated as significant attention in modern business practices. The environmental crisis impacts in numerous ways e.g., the greenhouse gasses emission from industrial sites and the demolition of natural assets have made significant harm in the environment. As the earth is shifting towards a sustainable economy, businesses and the industries, ultimately, it has a crucial impact on the environment. The shortage of environmental resources and natural pollution concerning water and air are significant barriers to sustainable development. Therefore, economic development is to be implemented systematically so that environmental aspects must be considered.

RMG sector in Bangladesh has a remarkable contribution to its surprising growth over many decades. As the second-largest RMG exporter of the world, this sector covers nearly 85 % of the overall export earnings of Bangladesh consequently possess more than one-tenth (11.2%) of the total GDP. Therefore, this sector has been pivotal in socioeconomic development, poverty alleviation and empowering people (Bhattacharja et al., 2019). However, operation of the traditional method (non-green) of RMG is questionable regarding environmental issues though the environmental safeguard is now a huge concern from buyer, entrepreneur and related stockholder.

In addition, misuse of a scarce resource (e.g., water) and extensive environmental contamination is a remarkable threat to sustainability (Reza et al., 2017) and increasing demands for an environmentally friendly production.

Bangladesh has been moving towards advanced industrial reform. The fast developments of these businesses have given advantages to financial and social improvement in Bangladesh. It has provided a large number of job opportunities, diminished poverty and expanded the high standard of living (Zohir, 2001). Bangladesh has gained significant development in diminishing poverty, upheld by sustained financial growth from its thousands of RMG factories (FIGURE 1). According to the international poverty line of \$1.90 (utilizing buying power equality exchange rate) in a day, it decreased poverty from 44.2% in 1991 to 14.8% in 2016/17. (World Bank, 2019). Bangladesh has a remarkable track record for progress and development, trying to achieve a middle-income nation by its' fifty-birthday celebration (World Bank, 2019).

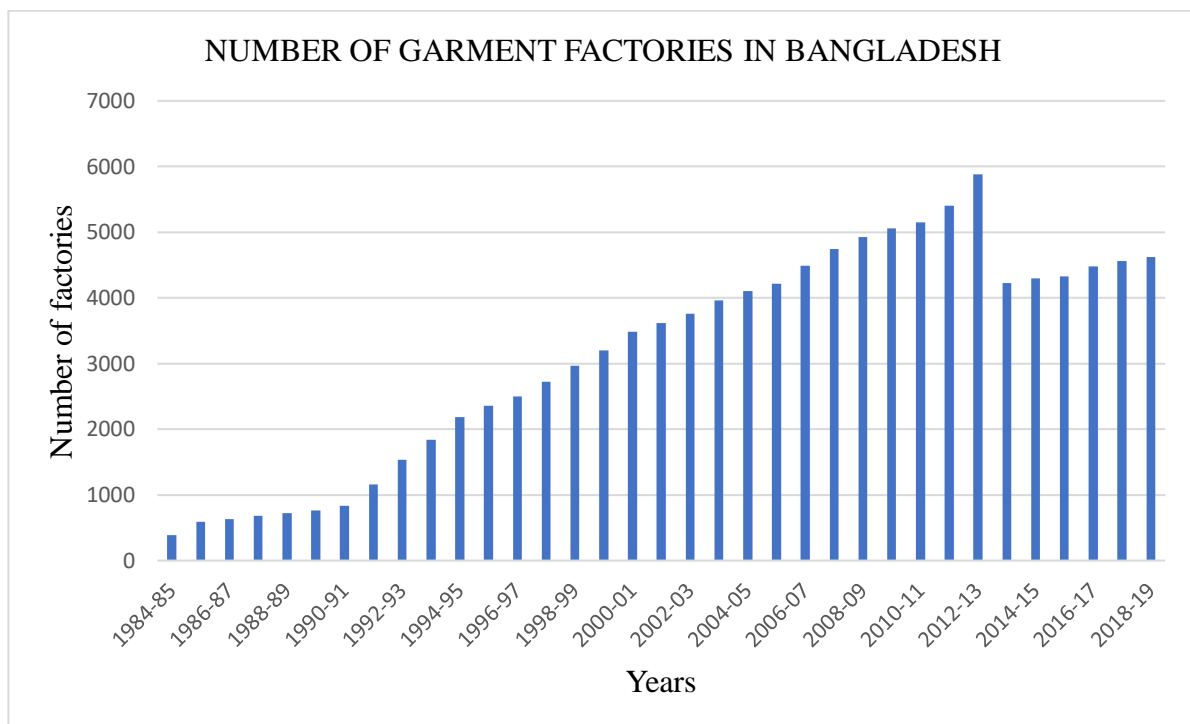


FIGURE 1 Number of garment factories in Bangladesh (Sources: BGMEA, 2020)

Bangladesh is embracing green standards for various industries including the RMG industry. In Bangladesh, major environmental issues are high consumption of



groundwater, inefficient use of natural resource in the production process, inaccessibility of gas, shortage of waste managerial administration and poor working health and safety conditions (Ahmed & Islam, 2014). If environmental worsening is continued, controlling any harmful consequence might be unachievable. For the economic development of Bangladesh, it is considered one of the significant concerns of the environmentalists, policymakers, administration and government (BELA, 2017).

There are five significant difficulties for Bangladesh garment sector, for example, poor infrastructures, inadequate backward linkage, compliance problems, economic and political unpredictably, labour inefficiency and low supplier (Berg et al., 2011). Prime difficulties are utility problems, for example, scarcity of oil and gas, dependency on foreign raw materials, inefficient suppliers and less labour productivity, higher interest fee and shortage of banking financial services and politically unrest (Chowdhury et al., 2014). One of the most difficult challenges of the Bangladeshi garment industry is an open competition. It appeared from the removal of the quota system of MFA agreement. The current sustainability issues of the garments industry under international market competition. The infrastructure systems like a road system, deep-sea and land port network facilities and utility facilities such as gas and electricity supply are considered as the main difficulties for the Bangladesh textile Sector (Hasan, 2013). Currently, developing new infrastructure like port, road, rail network facilities have become significant prerequisites for garment industry progress and sustainability (Schwab, 2014).

Moreover, the competitiveness needs special focus to achieve long time sustainability since the market competition is growing steadily within the industries. The market competition is increasing nationally and internationally. There is growing awareness about the present natural resource-intensive business models. The current business model will not work in the future. If any business creates a negative impact on the environment, then it is considered as business risks. To achieve competitive advantages, many Bangladeshi factories are implementing green standards (BKMEA, 2016). Constructing green factory buildings is considered as the key

There are two main markets for Bangladesh RMG products such as the USA and EU. These two export regions provide nearly 80 % of the total of Bangladesh's RMG exports. EU market is the most significant export market of Bangladesh RMG exports. It is one of the biggest export markets, and this market is going to be the highest export market of Bangladeshi RMG as a result of the GSP support gave by the EU. In 2018-19, the EU single market covered (61.91%) of whole RMG' exports. The USA market is considered as the second biggest export destination which was covering (17.97 %) of the total exports whereas Canada imported (3.45 %) of the total exports market in Bangladesh (FIGURE 2).



FIGURE 2 Exporting destinations of RMG, Bangladesh (Sources: BGMEA, 2020)

It is evident that Bangladesh has a glorious rising history of RMG market and being adapted with the green garment factories from the leading position in this world. However, shifting from a non-green to green is not an easy method which involved with a huge transformation and requires a large scale of investment including infrastructure development, technical knowhow and meeting other sustainable criteria. On the other hand, the price of the product cannot be increased rapidly to recover the new investments due to market competition and of course there is also an ethical issue to increase the price overnight from the consumer perspective.

Hence, it motivated me to explore the hidden scenario towards the green RMG factories in Bangladesh.

Bangladesh is the second-largest RMG exporter in the world from many decades. Even in the period of world economic recession Bangladeshi garment industry remained in the top position. However, there was not a single miracle that helped the industry to reach the current position in the world, besides there are many challenges and barriers that garment entrepreneurs have been facing. The main purpose of the study is to find out the motivational factors and challenges towards green garment factories in Bangladesh.

### 3 THEORETICAL FRAMEWORK

#### 3.1 A Brief history of “Dhaka Muslins” and RMG exporting

Dhaka was a different place of sourcing cloth in the 18th and 19th century. The 18th-century British historian Robert Orme said Dhaka was a place of all clothes for the king and king’s seraglio. During the 1760s, Dutch tourist Stavorinus said ‘‘Bengal fabric muslins were made so fine that a bit of twenty yards long or much longer could be placed into a typical pocket "tobacco box" (Berg, 2015). In Taylor's era, the usual demand for Dhaka muslins fabric was declined dramatically because of the new British colonial rule. The British colonial new policy ruined the hand-loomed garment industry of Bengal. The British imposed rule to its citizens to become sole clients of machine produced garments from Britain. However, the Dhaka muslin fineness was much better than machine-made cloth of Britain. It continued to sell on a limited scale. Finally, the market of renowned Dhaka’s muslins fabric came to an end (Glassie& Mahmud, 2007).

Current, exporting of Bangladeshi RMG products began in the late 1970s. Initially, it was a tiny non-conventional export. But the concrete garments exporting journey was directed by the founder of Desh Garments in 1979. The Desh Garments was the first completely export-based company from Bangladesh. Late Mr Noorul Quader was the founder father of completely export-oriented ready-made garments industry in Bangladesh. He was a maverick and non-traditional businessman. He was a secretary of Bangladesh Government until 1974. He was the founder of Bangladesh Parjatan Corporation (khan, 2015; BGMEA, 2020).

#### 3.2 Accident, GSP, Accord and Alliance

April 2013, eight storied Rana Plaza building collapse at Dhaka, Bangladesh. The Rana Plaza factory was producing low-cost cloth for western top buyers. This horrifying accident is the cause of killed 1132 people and injured about 2500. Obama administration suspended GSP (Generalized System of Preference) support for

Bangladesh RMG sector from 2013 by claiming that Bangladesh did not meet the statutory requirements of worker rights (USTR, 2015). This GSP suspension can impact on the glory of the state and may lose validity as a business partner. This may cause a long period impact on the possibility of future export expansion of the state. European Union may take similar initiatives. The European Union, the biggest buyer, gave a restriction earlier to expel particular supports to Bangladesh garment items if they do not take proper actions to improve the employees working conditions in Bangladeshi garment factories (BGMEA, 2020).

The Accord and Alliance are two legitimate authorities in Bangladesh. These two organizations have a huge impact to ensure working safety in Bangladesh garments industry. This Organization are independent, they have a joint agreement with the Bangladeshi worker's organizations, for example, BGMEA, international trade unions, Bangladeshi Government, ILO, and global brands and retailers (Islam et al., 2016). This legally joint agreement was formed to ensure a healthy and safe Bangladeshi garment industry. After the few terrible accidents such as Tazrin fire and Rana Plaza building collapse, The Accord and Alliance are considered as an essential part of Bangladesh garments sector. Accord's statistics showed that they have inspected about 1,600 garment factories. Accord has completed more than 89 % remediation task in the Bangladeshi garment industry. 172 garment factories have achieved 100% remediation (Uddin, 2018).

In recent years, Bangladesh garment industry is facing challenges from the Alliance and Accord (Islam, 2015). The purpose of these two organizations is to work together in the direction of the healthy and safe garment industry in Bangladesh. So, fulfill the rules and safety guidelines for building safety and fire safety have become a significant challenge. Often the condition forced by the Alliance and Accord needs joined efforts. Sometimes it requires large scale financial investment, for example, plant shifting, infrastructural redesigning and huge investment in factory fire safety.

### **3.3 Industrial pollution in Bangladesh**

Bangladesh aims to become middle income by 2021. Bangladesh has witnessed a rapid growth of its RMG industry. The textile industry is considered as a dominant sector for earning export revenue. However, industrial pollution has become one of the major challenges in Bangladesh. Bangladesh faces many difficulties in maintaining industry standards. Industrial pollution is considered as a threat for all living creatures. Country's faces the enormity of industrial pollution. Some analysts see it as an environmental catastrophe (Inam, 1995). According to the Department of Inspection for Factories and Establishments, there are about three thousand garment factories situated in Dhaka, Bangladesh. Untreated industrial liquid waste has been released into local rivers. It contains lead, copper, zinc, arsenic, vanadium, mercury, molybdenum, cadmium and chromium. Bangladesh textile industrial waste water was projected about 217 million m<sup>3</sup> in 2016. Wastewater pollutants may reach 349 million m<sup>3</sup> by 2021, if the garments factories are continuing using usual dyeing practices (Hossain et al., 2018). River pollution is affecting human health. Textile dyes have found in vegetable and fruit from Tongi, Dhamrai and Saver (Mohiuddin, 2019). The best approach to solve such industrial environmental pollution is to restrict conventional dyeing practices. Green garment factory ensures environmental aspects into all step of the factory building construction. Its objectives to provide a healthy working environment, improve workers productivity, decrease the environmental impact and optimum use of natural resources.

### **3.4 Green industry**

The 'green industry' originates from an idea 'green economy, a systematic process towards sustainability. This pathway is maintained by world-leading organizations like the United Nations Environment Program (UNEP), World Bank (Barbier, 2012). Guidelines, policies and projects give the ascent of the green industry. The green garment industry is considered by all environmentally friendly aspects. The green factory is not destructive to the environment like conventional industries. A green factory doesn't focus only on production. Environmental sustainability and human

health safety are major concerns of a green factory. (Hall & Dickson, 2011) A green factory aims to construct a factory that combined social aspects and environmental aspects with economical consideration.

In a wide meaning, a green factory uses less water consumption, low energy, efficient use of resources, reused and recycling of solid waste, the processing plant is free from hazardous toxins and reduced emission of harmful gases. A green industry provides a strategy towards all type of growth by decreasing its effect on the environment. The ecological impact may or may not directly relate to the current improvement but the environment system at large. A green factory can support them to decrease costs, fight against environmental changes, to consider sustainable business development and open door to new opportunities (Fineman & Clarke, 1996).

As reported by UNIDO (2011b), two primary approaches towards making such factory are by introducing new techniques or beginning from scratch. For instance, implementing a green factory relates to a sector or an industrial plant which is functioning. This initiative benefits the long-time environmental performances despite sector, place or size. Moreover, this includes any inner procedure that decreases the ecological impact by ensuring most efficient resources and best use of environmental resources, renewable energy, by solving the health and safety problems and decreasing any other threats. Furthermore, to develop green sector an industry should focus on zero natural pollution. An organization should concentrate on adjusting the cutting-edge techniques while introducing renewable power and raising the business in a systematic process that green standards are applied in the very beginning of planning (UNIDO, 2011b).

### **3.5 Sustainable and green Production**

Sustainable production is the process of manufactured items through financially stable systems that reduce harmful environmental effects while using natural resources and energy (Haapala et al., 2011). Business is adopting eco-friendly practices to decrease cost and waste, increase brand reputation and sales, improve growth and

worldwide competitiveness, providing the answer to the regulatory authority and potential opportunity, easy stuffing and retention, easy access to financing and capital.

A green factory can diminish the overuse of resources. This is especially convenient because this removes all inefficiency in the process and diminishes waste. Improved use of resource efficiency, for example utilizing clean energy, optimum use of water and materials, allows assets to be preserved, decreasing the demand for crude materials by utilizing them more effectively, impacts related with extraction and harvesting are diminished (Peck & Chipman, 2007). For example, the reusing of used materials in factory production diminishes demands for the using of new natural resources. This saves natural resources related to the extraction. In the textile factory, reusing of water reduces excessive use of water and diminishes the requirement of new investments in new sewage treatment plant. Waste is decreased because this relates to shifting from straight systems to advanced productive close loop process. Advanced product or service is a design based on recycled materials. It can also enhance the lifespan of the method by reducing pollution, diminishing waste from the whole life cycle and removing hazardous materials (Zhang et al., 1997). Thus, green production enhances sustainability, and both have a similar target in using optimum resources for the best output.

### **3.6 Green garment factory**

Green cloth factory is characterized by sustainable garments production. Green cloth factory is a methodological process that incorporates clean manufacturing practices and green building, CSR practices, as same as financial and social advantages (Bhattacharya, 2011). It decreases the utilization of the environmental resources and ecological harmful effect of factories during development, operations, entire products lifecycle, building environmentally friendly products and industries to get the target of reducing less energy consumption factories and little carbon emission industries. There are two main components of a green factory such as green building and clean production.



Green building is the process of constructing buildings and utilizing methods that are eco-friendly and resource-efficient throughout entire building's life cycle. It includes building design plan, operation, construction, deconstruction, maintenance, development, and reconstruction. Green factory building fundamentally focuses on decreasing the overall harmful effect on human health, natural resources and environment (Barrie, 2009). According to the UN environment programme, Cleaner production is an integrated environmental system to procedures, products, and services to enhance efficiency and diminish risks to the environment and human (Barshilia, 2014).

### **3.7 Advantages of green factory**

#### **3.7.1 Optimum use of energy**

The Bangladesh RMG industry is dominated by three major energy sources like diesel power, grid power and natural gas. Most of the garment factories are running 24 hours. Factories depend on constant energy supply. Natural gas is considered as the main source of energy. The green factories are reusing exhausted generator gas to run other heavy machinery. It reduces the high use of energy throughout the year. In the green plant, the heating device is connected with the factory boiler to reuse the heat from chimney gases to increase the temperature of feed water. Consequently, the factory required low energy and it also increases overall boiler efficiency. To ensure the best use of energy green factories is using LED lights, daylights, servo motor, eco-friendly machinery (Bhattacharja et al., 2019). S M Monirul Islam, CEO, IDCOL confirmed that, energy efficient activities in garment industry will strength productivity and competitive advantages (Financial Express, 2019).

#### **3.7.2 Promoting sustainable energy uses**

Production of renewable power facilities is considered as an important credit point for archiving green factory certificate. The primary sources of sustainable power are wind, water, biomass, solar etc. (Rezaei et al., 2013). In Bangladesh, green garment

factories are generating renewable energies mostly from solar. Bangladesh gets everyday sun radiation about 4 to 5 Wh/ m<sup>2</sup> (Alauddin, 2014). The Bangladesh government is concentrating on the modern net metering system. For the green factory establishments, net metering plays a particular role to get power efficiency (Nabi et al., 2016).

### **3.7.3 Optimum uses of water resources**

Water efficiency means, optimum use of water and decreasing waste of water (Sheth, 2017). As indicated by the United States Environmental Protection Agency (EPA), Water efficiency is the optimum use of water resources through modern water-saving technologies and fundamental steps that can be taken around the industrial perspective. To guarantee the optimum use of water green project is using the water treatment plant, water tracking system, water-efficient urinal, water-efficient toilets, reusing the basin's water in toilet flushing etc. Green garment projects are focused to ensure the best use of water-efficient technologies in the whole factory (Bhattacharja et al., 2019). To maintain green industrial production and to keep the environment safe rainwater harvesting is a potential source of utilizing groundwater. Textile industry needs a high quantity of groundwater. Bangladesh has a long period rainy monsoon season. Bangladeshi green garment processing plants are reserving rainwater in a systematic process and using storing water in the production.

### **3.7.4 Indoor environmental quality**

Green garment factories are ensuring working safety, improving internal environmental quality and healthy working place. Green garment factory interior designers are aware of maximum flows of natural air. Green factory building made of low emitting materials (Bhattacharja et al., 2019). It provides thermal comfort in the workplace. Efficient floor management and great compliance protection provide a safe work environment to the labourers in green garment factories.

### 3.7.5 Social aspects

A green factory plays a good role in society. A green factory helps economic growth and employee benefits. It also contributes to eliminating the poverty level in society. For instance, there is a large work opportunity in the plastic business in Bangladesh. However, it is considered as an informal job sector. A green factory can be a source of good earnings, which will improve job conditions and more productivity (UNIDO, 2011a). Bangladesh has the highest global market share in the solar home system. It shows the opportunities and people interest in using renewable power in Bangladesh (Bhuiyan, 2017).

### 3.7.6 Economic aspects

A green industry's economic benefits generated from best business performance because of operating green standards. In a green industry, buyer requirement is put differently. It gives a solid ecosystem and supports sustainable growth for the future. It also gives a good outlook in the international value chain, making new opportunities in the international markets (UNIDO, 2011b). Embracing a green market creates more employment opportunities, according to the energy industry, 3.5 million latest employment opportunities have been created to the job market by sustainable power usage in contrasted with 2.5 million new jobs vacancies from the gas and oil industry (Ferroukhi et al., 2015). Furthermore, improving ecological performance will help to grow economical funds. For instance, power efficiency will decrease the higher use of energy. This will benefit the overall finances of a company. There are more cost savings from remediation reserves. Distinguishing environmental issues imply that a right step can be recognized which help in saving expender. Researches prove that clean energy technology process has short restitution times and lead to cut down yearly expenses (Von Weizsäcker et al., 2009). After primary developing expenditure, these investments assist to reduce the use of resources through efficient productivity. These saving funds can be utilized in the growth of the business, creating new job opportunities or industry development.

### 3.8 Implementation of green factory

To progress sustainable, affordable, healthy and environmentally friendly practices in factory projects, factory construction, factory designing, building development, any new development and key renovations need to fulfill program requirements to receive the green building status. For green accreditation, environmental rules, policy are required to implement. Typically utilized green building ranking and accreditation methods around the globe are known as Green Globes, Energy Star, NZEB, Passive House Institute US, WEEL Building Standard SITES, Leadership in Energy and Environmental Design (LEED) etc. Presently, Bangladesh is following the LEED green building scoring system implemented by the USGBC. As indicated by LEED guidance, construction site must be complete, permanent place for building, using a proper site boundary. The building structure should contain at least 1000 sq. ft floor area to meet the floor requirements. Additionally, the construction site must share entire water usage, building energy (USGBC, 2009).

### 3.9 Accreditation of green garment industry in Bangladesh

Sustainable economy through a green sector can be achieved by following a framework. In the case of large buildings, 40 % to 95 % of anthropogenic gas emissions increased by operational power use, the other emissions caused by construction works and deconstruction activities (USGBC, 2017). There are numerous kinds of score systems exist to get green building certification. At present, there are about six hundred green product certifications in the globe (TABLE 1 shows three of them). Green product accreditations process takes a distinctive strategy to credits for environmental factors connected to the green sector (Vierra, 2016).

TABLE 1 Green building certificates provided by the major RMG exporting destinations of Bangladesh (Source: Vierra, 2016)

Name	Country
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Building Research Establishment's Environmental Assessment Method (BREEAM)	United Kingdom
Leadership in Energy and Environmental Design (LEED)	USA
Green Building Initiative (GBI)	Canada

In Bangladesh, the most regularly used green industry framework system is based on credits allocation and green buildings rating. To get an official green industry certification, LEED U.S. is considered as the only authorized body by Bangladesh Bank (Nabi et al., 2016).

### 3.9.1 LEED certification

The U.S. Green Building Council (USGBC) developed a process to identify and measure a green building site for sustainability. In the building industry, it is well known as a LEED green building ranking system. The ranking process provides a standard for the building construction, designing and function of a green building. The overall ranking methods are accord based, driven by market and voluntary (USGBC, 2009). There are four key steps to get LEED certification such as register, verify inspection and certify. LEED certification procedure involves in four particular levels (FIGURE 3). These levels are based on 100 points ranking system.



FIGURE 3 Levels of LEED certificate (Sources: USGBC, 2017)

These are LEED Certified (40-49 points), LEED Silver (50-59 points), LEED Gold (60-79 points) and LEED Platinum (80 points and above). The outstanding level of

green certification is known as LEED Platinum. LEED Platinum certificate can be achieved with 80 points or 80+ points. (USGBC, 2017) There are 24 platinum rated LEED certified garment factories in Bangladesh, and six platinum ranked LEED garment factories are listed in the top ten in the world (Mirdha, 2019b). Osman et al., 2017 listed the top nine LEED certified textile industries in Bangladesh (Table 2).

Table 2: Top Nine LEED Certified Industries of Bangladesh (Source: Osman et al., 2017)

Name of Factory	Points Earned
Remi Holdings Ltd	97
Plummy Fashion Ltd	92
Vintage Denim Studio Ltd	90
SQ Celslus 2	85
Genesis Washing Ltd	83
Genesis Fashions Ltd	81
SQ ColBlanc Ltd	81
SQ Birichina Ltd	81
Envoy Textiles Ltd	80

### 3.9.2 LEED rating system

The LEED green building rating system is widely used to implement affordable, viable, hygienic and environmentally friendly practices in building construction and building design. The purpose of the ranking system is to certify and standardize industrial buildings and all types of high-rise residential buildings. There are seven base categories and two bonus categories for the accreditation procedure (TABLE 3).

These are Integrative Process (IP), Location and Transportation (LT), Sustainable Sites (SS), Water Efficiency (WE), Energy and Atmosphere (EA), Materials & Resources (MR), Indoor Environmental Quality (IEQ), Innovation in Design (ID), Regional Priority (RP) (Osman et al., 2017).

TABLE 3. LEED certification scorecard with seven base categories (Source: Osman et al., 2017)

<b>Base categories</b>	<b>Points</b>
Sustainable Sites	26
Water Efficiency	10
Energy and Atmosphere	25
Materials and Resources	14
Indoor Environmental Quality	15
Innovation in Design	6
Regional Priority	4
<b>Total</b>	<b>100</b>

### 3.9.2.1 Integrative process

LEED Integrative process means a comprehensive approach with equipment and building systems. The Integrative Process cannot be considered as checklists. It promotes integration throughout the early design stages. It has three stages such as discovery, design and construction and the period of operation, occupancy, performance feedback. Project workers always look for combine systems and units. These efforts can enhance environmental advantages, human comfort, best building performance, effectiveness and efficiency. The Integrative process should include accurate questioning, challenge common project presumptions (USGBC, 2019).

### **3.9.2.2 Location and transportation**

The initial main concern that needs to think during the development is to select the strategic place that gives connectivity with the site premise to suitable conveniences. These include the easy accessibility of developed roads, access to best transportation systems and good connections to utility facilities, for example, water, gas, electricity, sewage systems. It is also necessary to decrease emissions of transportation to the company. The site should contain a proper public transport system, suitable parking places and cycling routes (USGBC, 2017).

### **3.9.2.3 Sustainable sites**

A sustainable project does not ruin any previous development or create any negative impact on habitats. This initiative gives importance to develop a previous project instead of a new establishment that causes deforestation or environmental changes. Moreover, planting trees that are local to the area to decrease the use of water and soil disintegration is the main concern. Besides, it is significant to use strategic resources for construction. So that it can provide sufficient build up heat that is required by users (USGBC, 2017).

### **3.9.2.4 Water efficiency**

The higher amount of water use causes damage to resources. In this case, one of the solutions is to utilize water properly. This means observing the performance of the water system by water management system and metering. Moreover, this incorporates diminishing drinkable water consumption by utilizing substitute water sources for unclean water applications. Reducing potable water use for machinery, fixture, showerheads and water systems that don't need high cleanliness of water is the most importance. Moreover, this decreases energy costs. Because a low amount of the water is needed to be conserved and processed (USGBC, 2017).



### **3.9.2.5 Energy and atmosphere**

In the case of the green industry, atmosphere and energy are the main important receptors. The energy efficiency performance ties with environmental conditions. This indicates energy efficiency performance of a plant including materials, orientation and the company's overall use of any energy. Importance of energy efficiency performance must be provided. Therefore, energy managerial process is done effectively, confirming the elimination of hazardous gas release to the environment, for example, chlorofluorocarbons (CFCs). Lastly, the use of clean energy gets a significant priority. This generates less carbon emission process that brings constructive environmental results (USGBC, 2017).

### **3.9.2.6 Materials and resources**

Using resources and materials is a significant parameter during the implementation of a process. Managing resources in an organized manner so that, it can diminish the misuse of resources. In this case usage of materials is getting priority. This also contains waste management procedures, efficient consideration thought the life cycle, recycling and reuse, cleaner production, a preventive strategic approach that helps to decrease waste (USGBC, 2017).

### **3.9.2.7 Indoor environmental quality**

Internal environmental quality is important to create human interactions in the Factory. In term of environmental concern, the company's internal environmental quality is given a priority. High-quality interior environmental quality can be achieved by structural development and controlling air pollution like as controlling carbon dioxide, tobacco smoke, improving ventilation. Using sun lighting will diminish high usages of energy consumption. Besides, occupants should have access to operate the expected setting for benefits (USGBC, 2017).

### **3.9.2.8 Innovation in design**

For green industry development use of new technologies is one of the major factors. This innovation category priority on developing new strategies that gives important progress to the project (USGBC, 2017).

### **3.9.2.9 Regional priority**

Some ecological problems are area related. It can be evaluated after careful consideration. The noticeable impacts of a region that cannot be denied such an area should be considered as a top priority. It includes drawbacks like as contaminated watersheds, water shortages or benefits like as sufficient sunlight, the land area that is good for rainwater harvesting. The major purpose is to find any kind of environmental problems that may rise due to the progress of the site project (USGBC, 2017).

## **3.10 Barriers in green garment factories**

### **3.10.1 Policy**

Government laws and orders is a significant driver for the organization's green management. State regulations raise the fear of fines and penalties for non-compliance among organizations. Usually, this driver is very useful for developing and adoption of environmentally friendly supply chain management in the manufacturing sector. Absence of environmental expert service and long-time contracts for embracing green supply chain management from the government policy has demotivated the company for developing the green cloth manufacturing sector (Srivastav & Gaur, 2015).

There are many organizations, which are not adopting green business practices despite huge pressure from investors (Tao, 2016). Lack of implementation of law and orders has worsened sustainable problems. The legislature of Bangladesh has amended their environmental policies, rules and regulation. Civil society, NGO are working as good partners for good management of natural resources. In several cases,

the judiciary has taken suitable environmental decisions. However, in some cases, court orders have not been executed properly (Khan, 2015). Current, BGMEA President Dr. Rubana Huq said, The Bangladesh garment industry did not have its own regulatory body. Barua (2019) sees this is a big mistake.

### **3.10.2 Market**

Most of the buyers are not conscious of GSCM (Green Supply Chain Management) products and services. A major challenge of green supply chain management in the small industry is unawareness of buyers about the advantages of green manufactured products. Customer demands are considered as key external pressure. In this case, if a buyer requests green products and services; the company needs to transform the organization and technology for new environmentally friendly products (Srivastav& Gaur, 2015).

Traditional, low eco-friendly materials, manufacture techniques and the manufacture in offshore, cheap labour countries normally are cost-effective than more environmentally friendly alternatives (Tao, 2016). International aspects, for example, language limitations and social boundaries can hamper communication. These barriers may lead to poor understanding and various assumptions of the given guidelines (Tao, 2016).

Green designers, professionals, green engineers, contractors, workers are not available in a remote area. The majority of the professionals, green engineers, contractors, architects are keen to work in major cities because urban areas have more facilities for their career and family life (Srivastav & Gaur, 2015).

In the present situation market vulnerability is extremely high because of worldwide competitiveness, buyer's requirements. The external business environmental factor will impact the innovation capability as same as an intention to adopt upcoming innovations. Market vulnerability and high competition is a strong barrier to establish green supply chain management in small size industry (Srivastav & Gaur, 2015).

### 3.10.3 Financial

Green financing is a new type of investment in the Bangladesh garment industry. Currently, Bangladesh Bank is offering a green fund. Bangladesh bank deposited \$500 million low rate fund for garment factory. This fund will inspire garment entrepreneurs to adopt eco-friendly machinery and green practices (World Bank, 2015). However, this support is not sufficient for nearly 5000 garment factories in Bangladesh. When the government provides financial incentives to organizations for environmental sustainability, it will strengthen the green industry. However, if the government rules and guidelines make environmental activities less beneficial or do not understand the opportunities, then it can be recognized as an obstacle (Kulatunga et al., 2013).

There is a misunderstanding that green building development is hugely expensive. Green production is considered as a luxury market. Usually, companies are not interested in investing green building as they believe them a luxury market. Companies are more attracted to acquiring new customers. Companies generally hesitate to spend on Green production because it often fails to meet the target (Darko et al., 2013). A significant number of the general population is worried about the price of the cloth than the eco-friendly production. Customers are not conscious of long-term potential savings from sustainable business practices. Traditionally, the price has been considered as the main performance measure. Generally, a high price is a major challenge in a green factory in comprising with the conventional cloth factory. The initial required capital is too high for green factory development, for example, green marketing, green manufacturing, eco-friendly packing and labelling are excessively high (Barshilia, 2014).

Environmental management includes two kinds of costs like direct expenditure and transaction fee. These types of expenses are considered as a key obstacle to implementing a green factory. Modern technology adoption, IT enablement, recruiting top qualified employees, training and motivating of workers towards sustainable clothing manufacture will need high investment at the beginning (Srivastav & Gaur, 2015; Tao, 2016).

### 3.10.4 Strategical

There is a lack of clear understanding of green cloth factory due to the lack of a company's strategy. It means that factories could be considered as green regardless of the lack of high standards. Subsequently, it may not achieve the projected benefits. (Kulatunga, 2013). This demand requires a significant change to succeed; it requires a strategic approach and well-designed works aiming to the key obstacles to the main action (Bhattacharya et al., 2011).

59 readymade garment industrial units have closed in the recent 7 months. 25,900 employees have lost their jobs. Dr Rubana Huq stated that "most of these garment factories were small or medium size companies. These garment factories were failed to manage compliance strictly. They could not pay workers' wages following the recent wage structure" (Mirdha, 2019a).

Green producing is not associated with other supply chain managerial priorities, for instance, an emphasis on cost decreasing or other economical matter, information related objectives; technical knowledge is considered as an obstruction (Tao, 2016).

The organizations that accept green activities operate green practices as their centre business; they do not coordinate green initiatives with their corporate business strategy. Consequently, the execution is imperfect and they unsuccessful in understanding the full advantages (Bhattacharya et al., 2011).

### 3.10.5 Organizational

Green practices include recycling materials, reusing materials, energy conservation and unsafe solid waste disposal. Innovative green business practices promote new market opportunities, innovative design and good quality. However, factories are facing high market competitions; companies try to lower the cost during the implementation (Srivastav & Gaur, 2015). If there is a low-price competition, it is going to be a barrier for implementation of green RMG manufacturing industry (Tao, 2016).

There is a lack of interest from the company side. There are different reasons such as lack of managerial knowledge, organizational support, and commitment. (Mazumder, 2013; Tao, 2016). M & S Bangladeshi country director Ms Bhowmick said, garment industry needs to re-skill employees and reducing its lead time for more productivity (Financial Express, 2018).

Organization's management body may promote workers to know green information. Education and training are the main important requirements for reaching the target of a green garment's factory. Company may give awards or incentives to green workers. Garment factory workers may be guided when they struggle with environmental issues. Management can offer support to know green information (Srivastav & Gaur, 2015).

Constructing a green factory is depending on skilled human resources and huge financial cost. A small company may not have enough resources for implementing green garment factory (Darko et al., 2013). There are a lack of technological systems and information, absence of strong corporate structures and procedures and the absence of environmental expertise skills for managers. These resources are required for sustainable progress (Tao, 2016).

### **3.10.6 Administrative**

Poor understanding of how to combine in purchasing and dependence on traditional bookkeeping methods may not be suitable for green companies. It is hard to assess their investments in developing green supply chain (Tao, 2016).

There are some sets of rules and regulations for the green factory. The factory must meet all requirements to achieved green garment factory label. But there is no measurement instrument to give the present performance level of the firm (Tao, 2016).Environment Director Mr Ahsan said, "they are implementing strict monitoring system to achieve the desired water quality" (Financial Express, 2018).

A company has to submit sets of documents to get the Green factory certificate. This process is a barrier since the documentation procedure is time-consuming and difficult (Barshilia, 2014).

### **3.10.7 People and efficiency**

Usually, People have little knowledge about green garment factory and the source of green products. When people have some information regarding environmental awareness, then there is some understanding of long-term economic benefits. The absence of empirical studies on the savings and expenses related to green factories makes it harder for the public to evaluate the financial case for their action (Darko et al., 2013). There are many workshops and seminars on environmental sustainability and green products. Although public neglect to visit them because of lack of awareness programs (Kulatunga, 2013). Besides, garments workers are not conscious of green activities. There is no extra reward for workers when they perform towards sustainability (Kulatunga, 2013). Sometimes sites do not appreciate designers to implement green features; especially there is lack of green planning (Darko et al., 2013).

The managerial support is an essential component of development and adoption of any innovations in a company, particularly in the case of an environmental management system. Top managerial help can strengthen new system initiatives. High-level management can support such new initiatives by initiating incentive system and rewards to motivate workers, by promoting worker empowerment, by establishing a cultural transformation and employee's commitment, by giving training, encouraging teamwork, communication through all units (Tao, 2016).

Although Bangladesh is just behind China in RMG exporting, Bangladeshi garment workers efficiency level is not sufficient with the international standard. The worker efficiency level is only one-fourth of Chinese employees (Clark and Kanter, 2011). Lack of bargain power and skills is a challenging issue for garment entrepreneurs. Buyers are not interested to pay an extra price for green factory

manufactured products compared to traditional factory (Bhattacharja et al., 2019). There are insufficient qualified technical experts to build Green factory. Furthermore, it is difficult to find employees who are well trained in green factory practices and manufacture (Darko et al., 2013).

### **3.10.8 Resource**

Education and training are the most important requirements for reaching the target of a green garment's factory. Lack of good training in sustainable manufacturing is one of the fundamental obstructions to implementing green garment factory. There is a lack of training capacity. Training capacity is very low compared to the large workforce (Tao, 2016). Green garment factory maintenance is complex. Implementation of green garment factory requires a strong commitment to innovation, maintenance, operation and updating (Tao, 2016).

There are not enough well trained and experienced experts in environmental knowledge who can give help and support (Tao, 2016). Technology is considered as a type of knowledge. A company will get higher innovative capacity when information and knowledge can be shared effectively inside the organization. A firm barrier means hardship of developing fundamental transformation in the company. This is predominantly right when there are transformations in the elementary features of the companies such as market strategy, authority, goals, operational strategy and core technology (Srivastav& Gaur, 2015).

An organization with the top qualified human resources can help in developing green garment factory supply chain management. High qualified human resources will provide innovative ideas, new plans, quick learners and professional knowledge of new technologies to solve problems effectively. However, employing high qualified employees need a high salary; therefore, maintaining high qualified human resource is a challenge (Srivastav& Gaur, 2015).



### 3.10.9 Supply chain

Supplier's interest and demand can give important support in the development of environmental sites, but they normally don't operate as a main driving force. Collaboration in supply chains management can help more efficient management of environmental problems. Suppliers are not interested to bring change in green garment factories due to the traditional mindset, Supplier's interests are different (Srivastav & Gaur, 2015).

On the other hand, many suppliers are providing eco-friendly technological supports. Often new technological solutions are not getting buyers due to poor awareness and lack of promotional activities of their products (Kulatunga et al., 2013).

Strong supplier commitment is important for the development of the green cloth factory. Poor supplier promise is significant external obstructions for green cloth factory. Cause it is extremely hard for an organization to manage a green supply chain if the suppliers are not willing to participate in green activities (Tao, 2016).

### 3.10.10 Technology

Rapid changes in technology can be a barrier to green practices. Information, communication and technological limitations like obsolete machinery or equipment at suppliers' facilities can fail to meet the needs of green supply chain management. (Tao, 2016) Some organizations hesitate to implement latest technologies due to change in the conventional model (Tao, 2016). Executive director of the Centre for Policy Dialogue, Dr Fahmida khatun said, Usages of new technologies may decline the scope for new job opportunities (Financial Express, 2018).

Innovative sustainable practices include energy conservation, toxic waste disposal, recycling materials, reusing resources. Innovative green business practices encourage new design, innovative market opportunities, and developed product quality. There are high market competitions and cost insinuations, companies try to

minimize cost (Srivastav, 2015). It is always hard to make an outstanding performance. It is also difficult to get points in exemplary innovation design (Barshilia, 2014).

Moreover, the market for substitute resources and technology needs development and innovation. There is an absence of awareness and influential factors that will support the buyers (Darko et al., 2013).

## 4 METHODOLOGY

In this section, the illustrations of the study approach followed for this research is described. The research utilized various strategies to develop a research structure and data collection. The study is descriptive.

The basic aim of this research is to find out major motivational factors, challenges and supports in the transformation of green garment factory in Bangladesh. The research questions are to explore hidden facts (motivation) of having the maximum green garment factories in Bangladesh in the world and understanding the prospects and limitations towards green sustainability of this industry. This research topic is fresh; hence an in-depth study was necessary. A remarkable portion of time was spent to choose relevant principles of qualitative research designing and executing for attaining the research objective.

Many stakeholders are involved directly or indirectly with this research topic such as suppliers, workers, producers, buyers and government policy. As an important entity, garment factory is the focal point among the stakeholders and management of this entity has the directing force towards the environmental impact of this industry. The presumption made here is that people are deliberate creatures, who are guided by their scholarly quality and encounters to comprise the world in a significant and purposeful structure (Morgan & Smircich, 1980). Hence, it was selected interviewees from the top-mid managerial personnel of 15 garment factories in Bangladesh to reach the study goal.

### 4.1 Research approach

A qualitative data study approach was used to investigate the research questions. Qualitative research assists to recognize the importance of phenomena. In a qualitative study, interviewees provide their views about the study topic dependent on their knowledge and personal experiences. Discoveries of the qualitative study are

eventually transformed into theory (Creswell & Clark, 2007). According to (Ormston et al., 2014), the aim of qualitative research is to deal with a comprehensive understanding of the social world across people. As the study area clearly affirms the preference of personnel in an inter-subjective environment, the qualitative data approach was chosen deliberately as the study method for this research to explore answers to the research questions and gather more knowledge about the topic.

Qualitative study is a useful method to make theory and create new knowledge from the gathered information (Eriksson & Kovalainen, 2008). There are two well-known research methods approaches such as inductive and deductive. In the inductive study approach, the analyst gathers empirical information and makes come out with a conclusion from the empirical information and it creates theories. Deductive study approach starts with theories and continues from that point to an ensured clear conclusion. In the inductive study approach, the analyst doesn't need to begin as a blank page because it is approved with pre-information about certain phenomena (Bryman & Bell, 2003). The study approach of this research is inductive study, where the specialist has gathered information about the theme from the literature.

#### **4.2 Data collection method: Semi-structured interview**

Qualitative interview was used to collect data for this study. Qualitative information can be gathered through observations, interviews, reports and various media materials, all type having its benefits and restrictions (Creswell, 2009). Dingwall et al. (2002) referenced that researcher's personal knowledge, information, skills, integrity and vision to analyses information can create great qualitative research. According to (Patton, 1990), a qualitative interview is often a useful way to explore what is going on someone's mind. It is the most appropriate tool to understand thoroughly the importance of a particular phenomenon from a participant's point of view in research (Kelly, 2010). Since I was interested to find out the factors (motivation & challenge) behind the green garment industry from the respective authority, this research required top to bottom analyses, exchanging perspectives and explanation of facts

with the participants. Thus, merely observation, records, documents and different kinds of media materials would not fulfil the need of the research. Therefore, I have chosen qualitative interview method for data collection in this study.

Qualitative interviews include many techniques, for example, structured, semi-structured, unstructured interviews, with various levels of rigidity and flexibility in interviews structure, wording and content (Kajornboon, 2005; Kumar, 2007). Entirety unstructured interviews could have implied the loss of control in addressing or questioning and distraction from the subject, hence risking similarity of the information (Kumar, 2007). On the other hand, semi-structured interview with open-ended technique allows the researcher to find a constructive way to discuss with the interviewee and explore the targeted matters (Baker, 2002). This research utilized a semi-structured interview with open-ended inquiries, the interviewees represented various backgrounds, they have diverse levels of information or knowledge, and to get applicable responses, it required a little adaptability in the structure and wording due to the different level of understanding of different interviewees. Moreover, semi-structured interviews or interviews give the researcher the chance to test further and get explanations, while keeping a methodical or a systematic and reliable order (Berg, 2001). In this manner, information gathering for this research was led through a few semi-structured interviews to discover the inspiration and difficulties of green garment factories in Bangladesh.

A total of 15 interviews were conducted for this research purpose. All of the respondents were directly working in the RMG industry and experience with the green garment factory. The major respondents were from Dhaka city and the remaining respondents were from Narayangonj, Gazipur, Sirajganj and Hemayetpur. In the beginning, the respondents were communicated through mobile, WhatsApp, Facebook, email. Later after scheduling time, the interview was conducted through using skype. The interviews were conducted between February 2019 and April 2020. The range of the interview time was 30 minutes to 60 minutes (TABLE 4). All interviews were organized in Bengali language with some use of English.

TABLE 4 Information on data collection

<b>Participant</b>	<b>Location</b>	<b>Type</b>	<b>Duration of interview</b>
Participant 1	Dhaka	Skype interview, notes taking, Recording	60 Minutes
Participant 2	Dhaka	Skype interview, notes taking, Recording	35 minutes
Participant 3	Dhaka	Skype interview, notes taking, Recording	40 minutes
Participant 4	Dhaka	Skype interview and notes taking	30 Minutes
Participant 5	Dhaka	Skype interview, notes taking, Recording	40 minutes
Participant 6	Dhaka	Skype interview, notes taking, Recording	35 minutes
Participant 7	Narayangonj	Skype interview, notes taking, Recording	18 minutes
Participant 8	Hemayetpur	Skype interview, notes taking, Recording	29 minutes
Participant 9	Narayangonj	Skype interview, notes taking, Recording	24 minutes
Participant 10	Dhaka	Skype interview, notes taking, Recording	17 minutes
Participant 11	Dhaka	Skype interview, notes taking, Recording	18 minutes
Participant 12	Sirajganj	Skype interview, notes taking, Recording	27 minutes
Participant 13	Narayangonj	Skype interview, notes taking, Recording	34 minutes
Participant 14	Dhaka	Skype interview, notes taking, Recording	46 minutes
Participant 15	Gazipur	Skype interview, notes taking,	42 minutes

The process of the interview was very smooth and was divided into three logical sections. In the first section, I expressed my aim of the interview briefly after greetings and familiarizing. As the interviewees were highly skilled and knowledgeable in this field of study, I did not need to explain much on the topic. In the middle section, I placed my pre-developed questions and in the final section, I discussed further to clarify different things to narrow down their views in relation to my aim of the research. Afterwards, the interviews discussions were reproduced and summarize in English. Then summaries were reconfirmed with interviewees to remove the misunderstanding of the original discussion and transcribed manually.

### **4.3 Selecting the interviewees for the study**

It was perhaps the most difficult part for conducting the study in choosing the respondents as the power and context are very important parts in the qualitative interview (Kelly, 2010). Since the research is focused on the green garment industry in Bangladesh, therefore, respondents must be experienced and knowledgeable from this industry. It was a huge job to find out the respondents and communicate with them. However, later I realized that the hardest part is ahead when most of the communicated persons were not responding at all regarding the interview schedule and even not answering the email as well. However, some benevolent persons gave their time after repetitive communications. Finally, most of the respondents gave their schedule in March-April 2020 when most of the garment factories were shut down due to the Covid-19 infectious disease. Importantly, in the end, I have been able to manage to make an interview from 15 interviewees of 15 different garment factories which ensure the randomness and diversity of the acquired data.

#### **4.4 Ethical challenges**

Reflecting on ethical issues is a critical matter while conducting qualitative interviews (Kajornboon, 2005). Confidentiality and comfortability are two important aspects of the interview process (Gray, 2013). Therefore, it was assured all the interviewees during the interviews that they have the full freedom to deny or answer any question to make them comfortable. In addition, they all were knowledgeable and experience in this field that was another important factor for them to be confident to cooperate in this study by interview. Further, they were also assured that their given information will be communicated always anonymously.

#### **4.5 Data Analysis**

Data analysis process for this research has been done through qualitative content analysis, which indicates the method of examining the content and meaning of different kinds of qualitative information (Eriksson & Kovalainen, 2016). I generally followed the direction given by Creswell (2009) for data examination. For this purpose, the transcribed data were read several times and cross-checked with the audio recordings of the interviews to avoid data transcription error. After that, the summary of the interview was categorized based on the research questions with particular respondents' number (identical respondents' number to TABLE 4) accordingly to form a simple data tabulation. All the gathered information has been investigated and evaluated based on the research questions and then, information was ordered into various topics and set with comparable topics.



## 5 EMPIRICAL RESULTS AND DISCUSSION

The purpose of this chapter is to find out the respondent's opinions on developing green garment factory in Bangladesh. Interviews were conducted to find out the main research questions. The interviews were conducted with top and middle-level managerial personnel from fifteen garment factories in Bangladesh. Most of these factories are located in Dhaka and Gazipur. The interviews were conducted in a process that interviewee can stay unknown.

### 5.1 Motivational Factors

There were eight most motivating factors from the interviewees on developing green garment factory in Bangladesh. All the participants (100 %) in this research have chosen environmental safety as the main motivating factor for developing green garment factory. The other motivating factors by the respondents were safe working place (67 %), buyer's pressure (47 %), attracting buyers (60 %), factory's reputation (47 %), less energy consumption (87 %), new rules and regulations (13 %) and employee's satisfaction (7 %) (FIGURE 4).

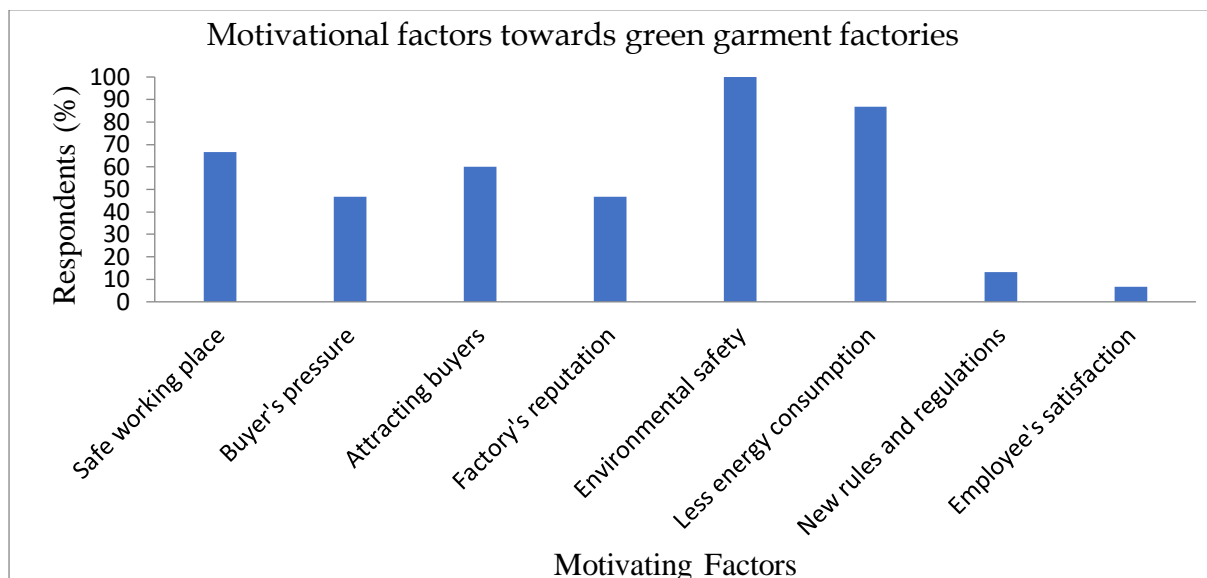


FIGURE 4 Major motivational factors of the factory owners driven for the green garment factory in Bangladesh

### 5.1.1 Safe working place

Ensuring a safe workplace for the workforce is one of the top motivating factors for a green factory. Majority of the respondents (67 %) found it as a motivating factor for moving to a green garment factory. The response was also almost identical – for example, Respondent 1 said, *“Most of our garments factories are safe but due to Rana Plaza tragedy we became more concern about the safe working place”*.

Every employee wants a safe working place. Safe working places have many benefits such as feeling good, high productivity, worker satisfaction etc. The secure workplace is considered as one of the topmost priorities for any industry in the world as it increases the productivity of the people (RMG, 2016). Bangladesh garment sector is facing problems after two horrific accidents such as Rana Plaza factory collapse and fire in Tazreen fashions. Currently, 93% of working safety remediation has been done in garment factories allied with the Alliance, a joint process to guarantee workplace safety in Bangladesh garment sector (Ovi, 2019).

According to the director of the BGMEA, Green factories guarantee a safe working environment for the workforce. The green factory owners must maintain some obligatory rules and regulations for the construction of the factory buildings (Ahmed, 2019).

### 5.1.2 Buyer's pressure

This study shows that buyer's pressure also played a significant role to transform conventional to a green garment factory. Nearly half (47 %) of the respondents found that buyer's pressure is a motivating factor towards the green garment and sustainability.

There was a significant decrease in RMG export earnings in the financial year 2013-2014 (83.79%) to the financial year 2014-2015(81.02%). This reduction happened

because of industrial accidents, major buyer's rejections, physical distribution, political instability and energy crises (Ansary et al., 2015).

At present, the international apparel industry depends on economic standard, technical standard and social standard. Bangladeshi garment exporters must follow international standard. Garments importers created extra pressure on the factory than the ministry of labour, BGMEA, Bangladesh Knitwear Manufacturers and Exporters Association (BKMEA) and government (Hossain & Arefin, 2015). There are many garments factory buildings located in a residential area. As a result, a few shocking accidents occurred such as Tazrin fire and Ran plaza accidents, which causes many deaths and injuries. These alarming incidents have brought safety issue as a prime concern (Islam et al., 2016).

### 5.1.3 Attracting buyers

A competitive advantage is a kind of strength that other competitors cannot provide. This study found that 60 % of respondents were motivated to set up a green garment factory to attract their buyers.

This finding is conforming with Asif (2017) that many garments buyer are demanding for cloths from environment-friendly factories. Bangladesh owned top green garment factories in the world. In recent years, Bangladesh's RMG export has dropped. Bangladesh's apparel competitors' market shares have increased (Mirdha, 2019a). In this case, the Bangladeshi garment factory owners can easily attract buyers. The third interviewee stated that *"green garment factory increases company reputation. Green factory can hold the buyer's attention. We want to ensure a good working environment"*. The green industry can enhance the buyer's attention (Bhattacharja et al., 2019).

#### **5.1.4 Factory's reputation**

This study reveals that nearly half of the interviewees (47 %) were motivated for green garments for their factories' reputation. The long-term opportunities for branding act as a motivating factor.

Similar finding was also drawn by Asif (2017) that majority of the top global retailers are becoming famous due to ecological and environmental conservation policy. Factory reputation is one of the motivation factors to build a green factory. A green factory provides a good working environment. Healthy work environments enhance the reputation of the company (Hossain & Arefin, 2015). There are reputations sensitive buyers. Reputation sensitive buyers are significant for factory compliance. In some cases, reputation sensitive buyers are happy to support factories with higher prices for a highly reputed brand as well as products.

#### **5.1.5 Environmental safety**

This is the only motivating factor by which all the respondents (100 %) were motivated for green garment factory. The rapid growth of industrialization is barriers to green development. If the lack of proper guidelines and initiatives continue, there will be a devastating situation within a short period. Industrialization is significant for any country's economic development. The green industrial development is required for sustainable growth. The green factory is a sustainable method of production. There are many garment factories in Bangladesh. So, the garment industry has a huge impact on the environment. Although there is limited profit at the current moment, green garment factories are providing long term benefits e.g., less production cost, sustainable use of resources and opening door to new opportunities (Fineman & Clarke, 1996).

The results of this study show that environmental safety is the main motivational factors for green garment factory development. Foreign buyers are already getting the low price and finest cloth from developing like Bangladesh. Additionally, sourcing from the certified green factory is like the cherry on the cake. Foreign buyers have higher expectations from the factory owners, but they do not like

to contribute at all. The participant 4 said, *“buyers are getting more marketing benefits and prices because of green factory sourcing”*.

### **5.1.6 Less energy consumption**

Energy-saving is a significant factor in wealth maximization, economic development and social growth in all countries. The majority of the interviewees (87 %) found it (less energy consumption) as a motivating factor for green garment factories in Bangladesh.

Garment industries have a large share of the total energy consumption in Bangladesh. Low use of energy can reduce energy cost. The transformation towards green factories is not only promoting green technologies but also helping to reduce energy consumption by 40 %. Green factory helps to decrease water usage by 30%. There are many benefits of green factories. It means less consumption of water and low carbon emissions and therefore less impact on the environment (Ahmed, 2019).

### **5.1.7 New rules and regulations**

After the horrific fire accident of “Tazreen Fashions” and the collapse of the “Rana Plaza” garment factory, the Bangladesh government has strengthened the inspection of factory buildings and establishments. Bangladesh government hired many inspectors to monitor safety issues and compliance. The government steps have a good effect to develop the infrastructure of the RMG industry. These changes (new rules and regulations) motivated a few numbers of (13 %) interviewees to green garment factory.

Previously, in Bangladesh, there were no strict state rules for factory buildings. In the past, it helps garment entrepreneur to start a factory very quickly. They could rent residential buildings and use for factory buildings. This study confirms the Bangladesh government’s strict new rules, regulations and monitoring system have a good effect to develop the infrastructure of the garment sector. But on the other hand, it is difficult now for a new entrepreneur to open a new garment factory.

### 5.1.8 Employee's satisfaction

Bangladesh garments industry has many issues concerning workers such as lack of appropriate infrastructure, safe working place. Employee's satisfaction was the less motivating factor among the interviewees as only 7 % were motivated from this. Employee's satisfaction is significant for productivity. There is a correlation between a safe working place and employee's satisfaction. The result shows that a safe working place is the second most significant motivational factors.

The findings of this study regarding "employee's satisfaction" seem alarming. However, there might be two factors which presented as negligible - firstly availability of the workers in Bangladesh and secondly this factor is overlapping with the "safe working place" which was supported by the majority of the respondents (67%). I suppose it for the latter one otherwise factory will face the internal competition between conventional garment factories and green garment factories by retaining their efficient workers for a longer period. Therefore, some garment owners are giving importance to worker safety and employee satisfaction. This was also found in Asif (2017) that a group of buyers declared not to place new orders because of low safety and environment issues.

According to interviewee 1, *"Green factories are more spacious, workers enjoy their daily activities, in some cases, it is a matter of pride"*. Working in a green garment factory is more comfortable than traditional garment factory. Vietnamese research shows that the clothing manufacturing plants where laborers report healthier working environment are increasingly beneficial and progressively productive. For example, employees with better working facilities achieved daily manufacture targets about 40 minutes quicker than laborers in processing plants with bad working conditions (RMG, 2016).

## 5.2 Challenges

The second interview question aimed to know the major challenging factors to develop green garment factory. After evaluating the data, the study found six key

challenges (FIGURE 5). The key challenges are high maintenance cost, huge infrastructure cost, use of new technology, higher production cost, financial support and more internal space.

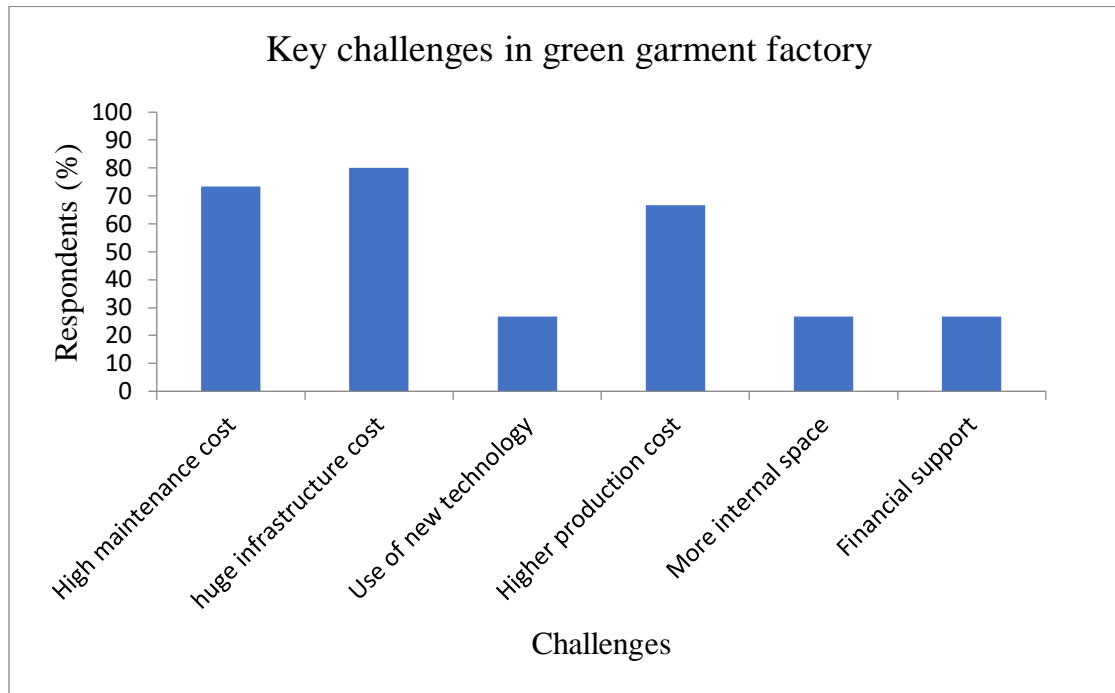


FIGURE 5 Key challenges faced by garment factory owners towards the green garment factory in Bangladesh

### 5.2.1 High maintenance cost

The high maintenance cost of the green garment factory is a challenge and, in this study, most of the interviewees (73 %) pointed it as a major challenge. Price of the product is directly dependent on the maintenance cost. If maintenance cost increases, consequently the product price goes up. Higher product price makes the company vulnerable if the competitors offer the same/similar product with the lower price.

According to Robecco SAM (2013) the economic dimension of sustainability does not mean only focus on economical growth; it also covers long term stable growth and ability of quick return. As most of the garment factories are the conventional (not green), a green factory cannot easily recover the increased price.

Moreover, the perceived cost of the customer is also a considerable fact i.e. how much they are willing to pay for a particular product regardless of how much it incurs for the green development. Interviewees found that green factory development creates unbearable cost pressure on companies. Factory management said that after launching the green project, power consumption has increased in comparison with machine efficiency. Respondent 3 said, *“Green garment factory is new in Bangladesh. There is a lack of local technical expertise to build a green factory. In some cases, new green garment industries depend on foreign consultancy firms. It increases constructions cost”*.

### **5.2.2 Huge infrastructure cost**

Majority of the respondents (80 %) found that huge infrastructure cost is the topmost challenge for the green garment in Bangladesh. Green factory infrastructure includes solar panels, inverter technology, energy savings technology, rainwater harvesting, water savings technology, new building structure. To install all these technologies needs huge investment. According to the respondent 5, Green factory cost is 25% to 30% more than developing a conventional factory.

Numerous Bangladeshi garment factories failed to meet the basic standards of building code. This caused various accidents such as fire and building collapse, (Ahamed, 2012). To attract new buyers investing in huge infrastructure is significant. In most cases, new building infrastructure is required to adopt green facilities as the existing building and premises are not suitable for this purpose. In the past, an entrepreneur could rent a building with limited capital. It was easy for new garment entrepreneur. Now they require a huge amount of capital. At present, even it became very difficult for old small and medium-size garment factories to survive. In the research, respondent 1 said, *“right now, there is no smaller size garment factory in Bangladesh. Only big garment factories are easily financing in the green sector.”* Though, small garment factories are significant for industrial growth, as these small factories keep the economy moving.

The increased fixed cost also produces a new break-even point which triggers increased production price. As the international market is not highly stable due to the



natural calamities (e.g., economic recession, worldwide diseases like COVID-19, flood, and earthquake etc.) and man-made activities (war, ill competition, lack of trust, profitability etc.), most of the companies cannot afford for the long-term cost recovery period. Therefore, the huge infrastructure cost has been the most challenging part of the green garment industry in Bangladesh revealed by this study.

### **5.2.3 Use of new technology**

A quarter of the respondents (27%) identified “use of new technology” as a remarkable barrier in the green garment industry. Traditionally garment factory is less technology-based and labour-intensive sector. Green garment factory requires the use of new technologies. According to respondent 4, *“the green concept was new, in the beginning; it was hard to handle with a green mechanism”*. The technical workforce cannot be employed at minimum wages. It will increase production cost in comparison with the local non-green factory competitors. So, it is one of the main barriers. Adoption of green technology is adding additional costs to the garment factory owners although there is no immediate payback period (Mirdha, 2018).

Like most other industries, In the case of using new green technology, green garment industries lack the right skilled workforce. Continuous training and skilled workers need to be developed for effective and smooth management and operation in green factories. Increasing efficiency among the government agencies as well as proper knowledge sharing is significant to scale up the green factory movement (Financial Express, 2018). Besides, skilled workers will help to identify lacking in green factory initiatives.

### **5.2.4 Higher production cost**

Two third of the interviewees (67 %) found that higher production cost is a barrier regarding green factory development. Most of the respondents told that buyers are always interested in low price. Low labor cost for a top-quality product is considered as one of the competitive advantages in the Bangladeshi garment industry. Green

garment factory increases production cost. When product price increases, it's become hard to sell in the market. Minimizing cost distortions is a significant step to implement green factories (UNIDO, 2011).

Higher production cost can appear from different sectors like high operating cost, huge infrastructures cost, new technological adaptation, training and development. The traditional garments do not need huge operating cost therefore per-unit cost goes down. In addition, it can be set up any location or even in a limited space therefore it does not cost huge infrastructure cost. Eventually, it has less effects on the per-unit cost. Furthermore, the use of old-fashioned technology which does not need much training as they are already used to with its functionalities, this sector does not incur a high cost as well. On the other hand, in every case, the green factory needs a very high cost that eventually turns into a higher production cost. Therefore, this is a challenging part of green garment factories in the beginning.

### **5.2.5 More internal space**

Approximately one-fourth 27 % of the respondents pointed out it as a barrier for green garment factory although respondents stated that green garment factory required 40% internal open space. Perhaps, it was not emphasized separately by the respondents as it was part of "huge infrastructure cost" and "high maintenance cost".

The extra required internal space required a bigger space for the factory. Therefore, transforming an existing garment factory to a green factory may not practical due to limited space. Eventually, in most cases, it needs to buy extra land and to build a new green factory. Thus, the internal space structure increases fixed cost (land, building, maintenance cost). This is how it is also a considerable challenge to address in the development phase of green garment factory.

Moreover, land scarcity and finding a suitable location is also a challenge for developing green factory as Bangladesh is 12<sup>th</sup> densely populated country (1116 people per square kilometer) in the world (25 people per square kilometer)

(Worldpopulationreview, 2020). Sometimes, buying a piece of land in Dhaka (US\$796.98/m<sup>2</sup>) is much more expensive than buying a piece of land in New York (US\$344/m<sup>2</sup>) (Alam, 2018).

### **5.2.6 Financial support**

A quarter of the respondents (27 %) recognized that lack of financial support is a barrier for a green garment factory in Bangladesh (FIGURE 5). The government has given normative instructions to take eco-friendly measures in the garments industry, yet there is no sufficient funding and subsidy to make it happen (Ahmed, 2019). Medium and small size garment factory owners are always interested in investing in economic benefits. According to the study, buyers do not provide adequate support for the green factory (FIGURE 6). Initially, a green factory needs a huge amount of investment, but the loan facilities are truly insufficient for attracting green transformation.

International buyers prefer RMG from Bangladesh over other countries not only for it is cheap but also for its superior quality. But there are no economic benefits from buyers. 250 Bangladesh's garment factories have spent \$39 million to install new water technologies. The use of new water technology will save 21 billion liters of water. KM Rezaul, CEO of Viyellatex said buyers do not give any additional single penny for sourcing from a green factory (Uddin, 2018).

## **5.3 Key Supports from the Government and Buyers**

### **5.3.1 Key Supports from the buyers**

According to the interview result, 87% respondent answered they do not receive any support from buyers (FIGURE 6).

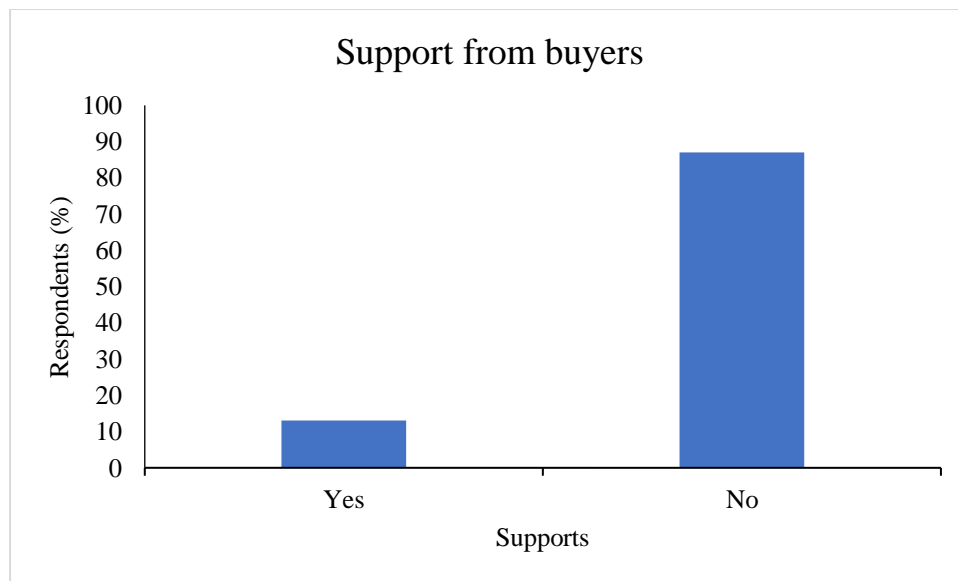


FIGURE 6 Status of the support by buyers for green RMG factory in Bangladesh

The respondent said 1 “we do not get any support from the buyers. Rather they are asking us to build all the facilities and offering lower prices”. Currently, Bangladeshi garment entrepreneurs are regretting building green factories as factory owners do not get benefits from the large investment. Garments exporters could have spent the money to recruit more workers (Uddin, 2018).

Green garment factories have significantly increased in number. There are more than five hundred garment factories have listed as green production facilities (Financial Express, 2020). But a lot of buyers and workers do not aware of the long-term advantages of green production facilities.

### 5.3.2 Key supports from the government

In this study, surprisingly 53 % of respondents said, they do not receive any government supports from the government. However, 47 % of respondents said there are insufficient green loan facilities from the Bank (FIGURE 7).

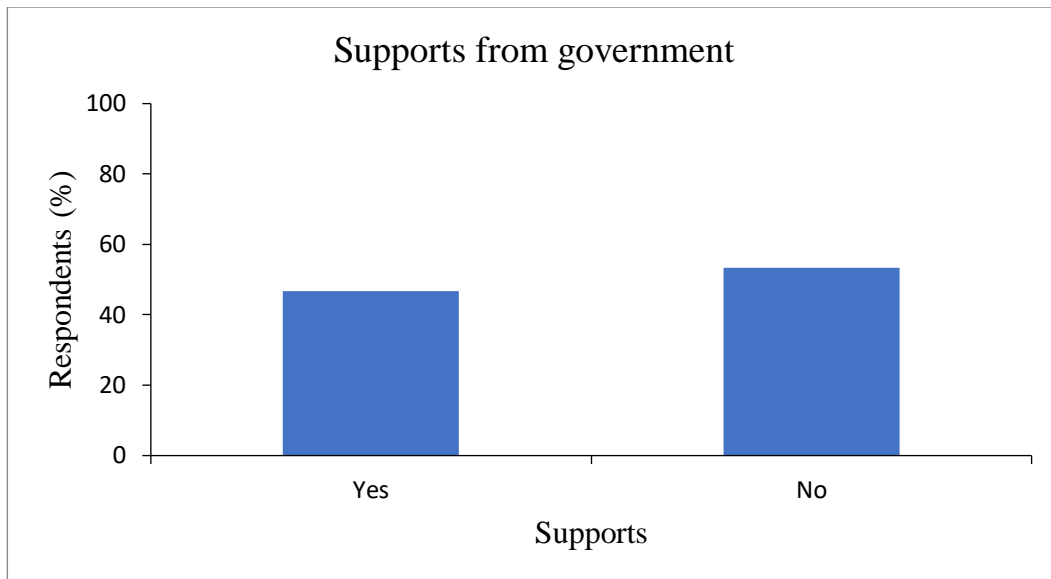


FIGURE 7 Status of the support by Bangladesh government for green RMG factory

The money lending process from the bank is bureaucratic and time-consuming. Sometimes, lending is also dependent on political influence and bribery. Therefore, there are two big groups revealed in this study with the opposite view. Nevertheless, some factory owners also do not get a loan due to their company credit ratings. Government support is a significant catalyst for green growth. It is clear that currently, there is not enough support for green factory development in Bangladesh. The value-added tax and high amount of corporate tax are also creating barriers for green factory development. Additionally, there is no economic benefit on imported technical devices (Mirdha, 2018).

In current years, the Bangladesh banking industry has received many flak for increasing non-performance loans (Hossen, 2019). So, factory owners are bound to take the loan with a high-interest rate. On top of this, green factory maintenance cost is much higher than managing a traditional garment factory. The initiative has inevitably declined the productivity of the garment industry.

## 5.4 Expectations from the Government and Buyers

In response to the questions on the expectations of garment factory owners from the buyers and governments – a diversified type of expectations arose in this study. These expectations include fair price, quota/priority order, tax deductions and infrastructure development. These are being described in the following subsections.

### 5.4.1 Expectations from the Buyers

Bangladeshi garment factory owners have already understood the importance of green initiatives. But there are many challenges. The success of green garment factories will depend on the duties and commitments of all stakeholders. Besides, interviewees mentioned, *“we have failed to create collective effort on buyers for our legitimate demands”*. So, the garment industry must continue collective efforts for negotiation with the buyers, government and international agencies.

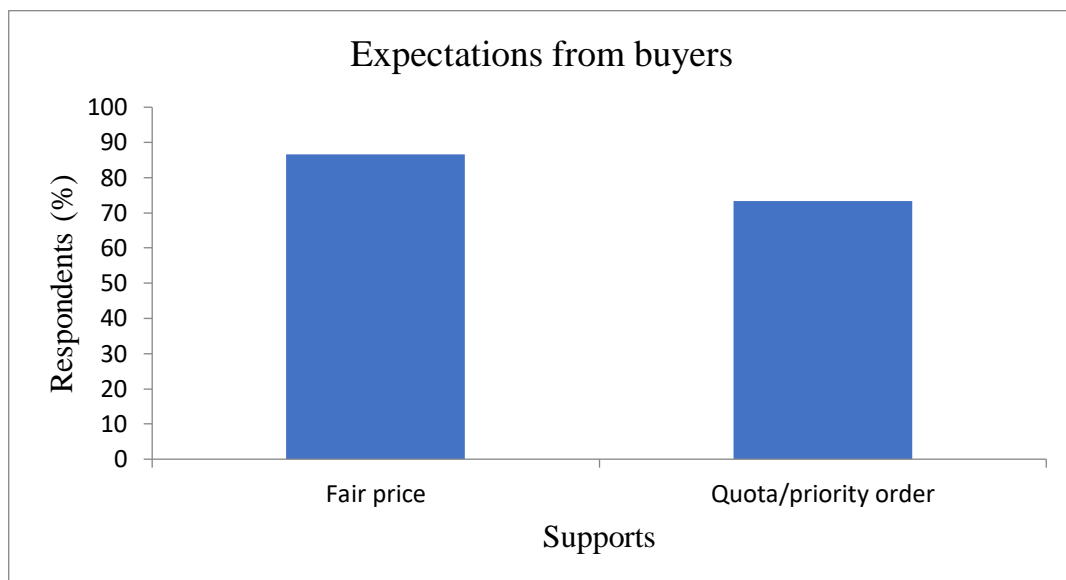


FIGURE 8 Expectations from buyers for green RMG factory in Bangladesh

#### 5.4.1.1 Fair price

Majority of the interviewees (87%) stated that buyer purchasing practice is not fair. They wanted a fair price from the buyers (FIGURE 8) from the ethical point of view. Sometimes buyers do unethical practices for example respondent said; to get cheaper price buyers have created low price competition between large and small garment factories. But large and small factories strength and capabilities are different. According to respondent 6,

*Although; the Bangladesh garment industry has the maximum number of LEED-certified green garment factories; it does not have any special significant meaning to world top apparel retailers. Sometimes, even they asked for a cheaper price than regular price. On the other hand, the employees' salary has increased.*

Currently, only larger garment factories are constructing green factory without depending on instant profit. Darko et al. (2013) also found that usually, buyers do not like to pay for green production.

#### 5.4.1.2 Quota/priority order

The main purpose of the quota system is to protect garment products of developing countries in the developed market. Quota benefits were abolished in 2005. In 2013, the Obama administration suspended GSP support for Bangladesh RMG sector. They claimed Bangladesh did not meet the statutory requirements of worker rights (USTR, 2015). In this case, garment retailers are now opened to buy a RMG from any countries whoever can provide a cheaper price. Green garment factory required a huge amount of investment. It increases the production cost. The study finds that there is a lack of motivation among RMG foreign buyers. Buyers should place some continuous orders for the appreciations of the green garment factory owners. In the study, 73% interviewees suggested that buyers can place some regular or priority order to a green factory (FIGURE 8). It can strength green garment factory in Bangladesh.

## 5.4.2 Expectations from the Government

### 5.4.2.1 Tax deductions

Most of our participants believed environmentally friendly business practice is critical. But the environmentally friendly business practice is the way towards the future. The green factory needs various types of eco-friendly equipment. A huge amount of initial capital and purchasing expensive equipment is considered as barriers to sustainable progress. The result shows, 67% of respondents like to receive tax deductions on for green factory development such as tax deductions on imported equipment (FIGURE 9). For example, South Africa has this facility for energy efficiency investment where tax is deductible (UNIDO, 2011).

The respondents added, Bangladesh government needs to promote greening success story in the diplomatic arena as they are performing best in comparing to other garment manufacturing countries. Additionally, considering the significant contribution of the garment industry the government can reduce tax for the development of green garment factories.

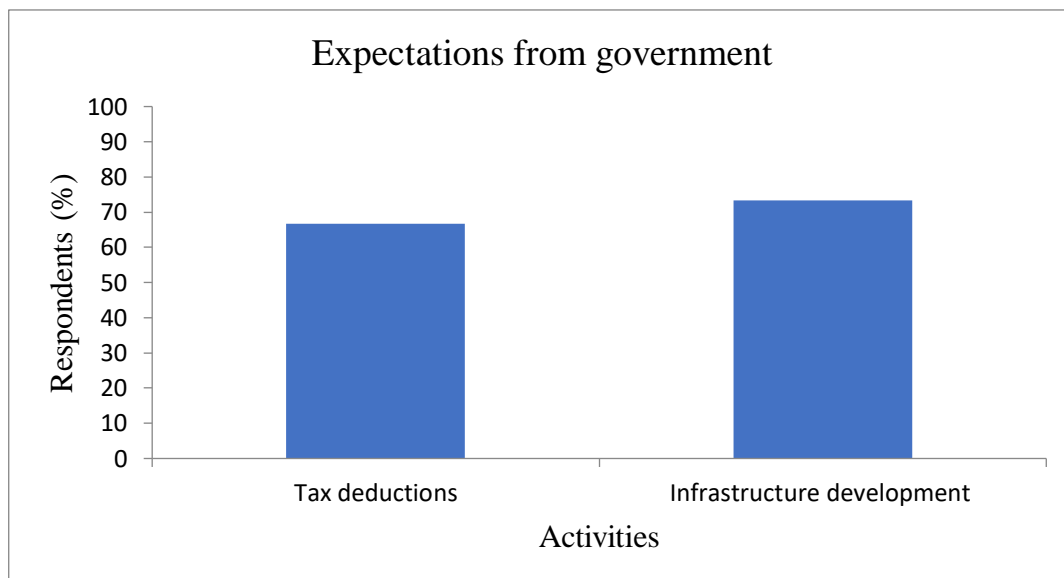


FIGURE 9 Expectations from the government for green RMG factory



#### **5.4.2.2 Infrastructure development**

Infrastructure development for green garment factory is necessary. 73% of respondents were concern about infrastructure development in Bangladesh. Utility supports, shortage of lands, transport problems, high-interest rate are difficulties for green factory implementation. Moreover, there are no road maps for green industry development. Furthermore, Bangladesh is recognized as a middle-income country. In light of Vision 2021, Bangladesh wants to be a developed country by 2041 (CRI, 2019). Therefore, Bangladesh needs sustainable infrastructure development to reach its target. The chief executive officer's advisory council of USGBS said, even though the garments purchasers are not interested to pay an additional price for green factories, but such factory helps in the branding of the company or the country. The progress towards green factories helped in restructuring Bangladeshi's RMG industries image after the horrific Rana Plaza building collapse. This incident causes injured more than 2000 and killed 1,134 (Mirdha, 2019b).

#### **5.5 Sustainable green garment factory for future**

Previous parts of this section showed that there are no remarkable supports from the buyers and the government. Additionally, green garment factory owners need to invest huge capital for the long run without further profit. This is certainly not inspiring. On the other hand, non-green garment factory owners do not need to make a big investment in their production. Therefore, non-green has a very high chance to offer lower price products to buyers. In general, buyers are also happy with the less price product regardless of the production process (green or non-green). This is how, green garments owner investing more capital and falling in an uneven competition. As Docherty et al. (2002) sustainability consists of three levels: individuals, Organizational and societal, therefore, there is a big question of whether green is going to be sustainable. That's why it was asked respondents how to make the green RMG industry sustainable for the future. They recommended five measurements to take combinedly for accelerating and sustaining green garments in future.

### 5.5.1 Awareness

Sustainable business development is a collective duty. Sustainable business practices can make a factory more marketable. The garment industry is considered as the prime sector of export earnings in Bangladesh. Garments industry provides job for 4.5 million people; about 80% of workers are women (Mahmud et al., 2018). The garments sector has a great impact to reduce poverty in the country. Therefore, long term development is important for the garment sector in Bangladesh. The green garment industry is a new demand to increase competitiveness (Bhattacharja et al., 2019). Moreover, creating a mindset among garment entrepreneurs is important. In addition, Education and training measures policies can be implemented among employees to promote awareness (UNIDO, 2011a). The green factory creates fewer toxins in the atmosphere. But people are not concern enough. So, government awareness programmers are important to enhance green garment factories in the future.

### 5.5.2 Diplomatic Initiatives

Bangladesh RMG sector is very important for social-economic development. Green commercial image is growing all around the world (UNIDO, 2011b). But the government does not care enough in comparison with non-government initiative. According to the respondents, currently, Bangladesh is facing an image crisis. Bangladesh has lost GSP support in the U.S. market. Although Bangladesh owned the highest number of green garment factories in the world. Transparency International Bangladesh (TIB) Executive Director, Iftekharuzzaman mentioned that workers safety in the RMG industry improved a lot (Barua, 2019). But most of the buyer's countries are unaware of it. The respondent 14 stated,

*There are misleading reports on the Bangladesh garment industry. For example, in 2015 the NYU Stern Center for Business and Human Rights published a report on the Bangladesh RMG (e.g. Beyond the Tip of the iceberg: Bangladesh's Forgotten Apparel Workers). This report includes many errors and false claim like local tailor shops of Keraniganj were considered as garment manufacturing factories; the total number of factors was double than actual number of factories. Buyers are getting wrong messages from this report.*

There is a big communication gap between Bangladeshi RMG sector and buyers as well as consumers in the United States and the Europe. The government should highlight Bangladeshi green factory success in the international trade arena.

### 5.5.3 Strong backward linkage

Bangladesh must source raw materials at a good price to keep the production price below the ceiling price to be competitive against other exporting countries. Bangladesh garments industry is currently facing challenges from quota-free countries (Bhattacharya & Rahman, 2001). Moreover, it relies on sourcing raw materials from outside. Sourcing from outside creates sourcing risks specially when the exporting country faces natural calamities like flood, earthquake or shortage of production. Sometimes, it takes an unusually long time. For example, woven fabric lead time is one week in Bangladesh, but sometimes it takes three weeks when it is collected from India and a month in case of China (Berg et al., 2011). Alarmingly, these countries are also the key competitors of Bangladesh in this sector. Therefore, there is a valid reason to stop exporting these raw materials immediately when the exporting countries are in adverse situations. Furthermore, the prices of textile raw materials fluctuate very quickly in Bangladesh (Islam et al., 2016). So, in the long run, self-producing backward linkage is the best way to lead this sector or at least to find alternative source countries that are not the main competitors in this sector.

### 5.5.4 Quota

Green garment factory requires a huge amount of cost and investments. But after implementing green factory many buyers have been turned away because of more price. According to Asif (2017), increasing high production cost of the cloth is the main significant challenge facing by Bangladeshi small garment factories. Sometimes buyers have offered low price than regular price. According to respondent 5, *“we do not get any support from the buyer. Rather they are asking us to build all the facilities of a green factory and offering lower prices”*. The key benefit of quota is to get regular order from buyers. The regular product order to a green factory can protect green garment

factory in Bangladesh. Quota system in a green garment factory can inspire other entrepreneurs to build a green factory.

### **5.5.5 Political tolerance and stability**

The readymade garment industry is considered to be the heart of the Bangladesh economy. Since the early years of independence, the garment industry has kept the wheel of the economy moving forward. Consequently, it is natural that any disruption in the garment sector will lead to bad impacts on the economy of Bangladesh. However, political instability is considered as one of the major difficulties in Bangladesh. The political problem is a prime threat to all types of industry. A strike increases production cost and reduces productivity. Sometimes, garments makers failed to manage their delivery agreement with the overseas buyers due to frequent use of strikes (Hartals). All the political parties should be sensible at least to the country's highest exporting sector (84 %) and its reputation (Barua, 2019). Besides, the application of new types of machineries will reduce more job opportunities. An automated garment sewing machine takes only 30 seconds to manufacture a t-shirt. It is a threat to current garment factory workers. Dr. Rubana Huq recommends rebranding green labour as same as adopting environmentally friendly approaches for garment industry (BGMEA, 2019).

## 6. CONTRIBUTIONS

The results of this study show that garment factory employees are motivating to green factory because of environmental safety (100%), less energy consumption (87%), to ensure a safe working place (67%), attracting buyers (60%) and buyer's pressure (47%). This research conforms with the previous studies that current industrial development encompasses with green technologies and energy-resource efficiency (Von Weizäcker et al., 2009). Developing countries have less social security and more environmental impact compare to developed countries. All respondents in this study stated, the country's socio-economic scenario is progressing as many employees are working in the garment industry. Huge infrastructure cost (80%), high maintenance cost (73%), higher production cost (67%) and use of new technology (27%) were the major challenges for developing green garment factory.

The research shows that, there is a strong correlation among environmental safety, safe working place and buyer's attraction. Weak infrastructure, insufficient buyer and government supports, less financial support e.g. high bank interest rate, shortage of awareness are prime challenges in developing a green factory in Bangladesh. Nine respondents mentioned attracting buyers was a significant factor to build new green factory. Thirteen interviewees mentioned about no support from buyers. Besides, eight respondents said, there is a lack of government supports. Bangladeshi garment entrepreneurs relish to develop more green projects to attract buyers. Bangladesh green garment industry is under heavy pressure because of low price competitive trends. A green factory ensures a healthy and safe working place. Exporting countries people get benefit from a cleaner environment (OECD, 2003).

Safe working place and attracting buyers have a strong correlation. The study found that, (67%) employees considered workers safety as a motivating factor. Ensuring safe working place for a large workforce is one of the main challenges in Bangladesh (Islam et al., 2015). Buyer external pressures are significant for safety working place. The buyer's pressure has changed to satisfactory working conditions (Hossain et al., 2016). Based on the findings, the buyer's supports are very low for a green factory. The garment factory employees expect buyer's priority-based order

support to take green factory initiatives to the next level. According to the respondents (73%), interviewees are looking for quota or priority order from the buyers for a green factory.

Respondent 15 stated, if buyers add few extra cents (20-25 cents) for the betterment of the workers and factory then garment exporters can easily contribute towards green industrialization in more meaningful ways. This research reconfirms the similar appeal of Bangladeshi Nobel prize winner Dr. Muhammed Yunus who proposed a 50-cent addition price on Bangladesh RMG products to create garment workers' welfare trust (Burke, 2013).

The study reveals that 80% of the employees considered huge infrastructure cost as their main challenge. Providing long term loan facilities can bring exceptional results for green garment factory development. Strengthening economical institutions along with environment or green awareness is a significant precondition for efficient clean production (OECD, 2000). This research shows that, a green factory-required more cost (80%). It increases production cost (67%), which considered as disadvantages during price negotiations with buyers. Most of the buyers (87%) do not like to pay extra for green factory product. This study shows, factory employees (1, 9, 11, 13, 14, 15) do believe that international policymaker should provide a purchasing guideline for buyers. Such guidelines can help the government, buyers and garment exporters to take a right decision.

Use of new technology is important for green factory productivity. Improving efficiency considered as an important competitive advantage (SERI, 2009). Initial training is needed for workers to improve the efficiency and adaptation with the latest eco-friendly machines. The government can reduce import tax on green technological equipment for the green garment factory.

One of the significant contributions of this research is there is no remarkable buyer's support for the green factory. 87 percent respondents do believe that buyers should pay a fair price. If garment exporters cannot get fair prices from buyers and the government imposes tight rules and regulations instead of providing proper services and infrastructure facilities, then there might be a potential threat of greenwashing. This lack of transparency will create additional pressure for all parties.

Therefore, the government should have active regulatory service. The best green practices relate to the systematic design, management and development policies (UNDESA, 2007).

Another contribution of this study is that, the government and owner should have a systematic long-term plan for green policies. Because there is huge investment compare to instant return. Besides, this study agrees, getting a suitable location for a green factory is difficult in urban areas. Every country's economical structure is different. This research finds that, new green factories are helping rural areas to become economically strong. The villager's living standard is getting higher.

Generally, green factory owners have a group of factories. In the case, big market players are the main beneficiary. Huge investment (80%) is a prime challenge. The big factories are getting bigger. But small factories employees are worried. According to respondents (73%), small factories have no future. Besides, medium factories are struggling to survive. Small factories cannot survive in the near future because of new rules is squeezing profits.

According to the findings, in a green garment factory production cost is higher (67%). Eco-friendly products and services are more costly than regular alternatives; the government authorities may unable to legitimize the extra expense to citizens (GTZ, 2006). The buyers or their local buying house know the strength and production capabilities of factories. For example, sometimes buyers do create low price competition between a green factory and a non-green factory. This is the reasons why employees have preferred buyers should stop doing unethical practices.

The industry is facing many challenges. Small and medium garment factories have less economical strength and limited operational capacities. They need a different set of green factory criteria because small and medium garment factories cannot afford to increase factory space or big investment. During the study interviewee (14 & 15) mentioned, that more local research is required in the Bangladesh garment sector, knowledge needs to be industrialized, so that relevant information and support reaches to right people and institutions.

Bangladesh garment sector is highly dependent on rural women (80%)(Mahmud et al., 2018). Most of them did not have the opportunity to work in a big industry. The garment industry is creating an income source to the poor. Rural women earnings added extra value in the family as well as contributing rural development. This working opportunity of village women has provided more economical freedom and increased women participation in decision making (Fauzia, 2006). In such a context, the low growth of garment factory will impact on socio-economic development. This research disagrees with the previous studies that, environmental sustainability actions can support poverty alleviation benefits (UNIDO, 2011b).



## 7. CONCLUSION

The RMG sector plays a key role in the progress of industrial development in Bangladesh. In a short time, the Bangladesh garment sector managed to achieve global recognition. Bangladesh ranked number one in Southeast Asia and second-largest garment exporter in the world. The main objective of this study was to find out the motivating factors and challenges of green garment factories in Bangladesh so that it enriches the knowledge of this subject matter and fuels for overcoming the challenges towards a sustainable green garment growth.

This study revealed that environmental safety, safe working place, less energy consumption, factory's reputation and attracting buyers among the others were main motivating factors behind going to the green garment factory. Furthermore, this study also discovered that huge infrastructure, high maintenance cost, higher production cost and lack of green-financial support are the main challenges for green transformation and sustainable growth of this sector. This study also extracted that fair price, green priority order from the buyers and tax deductions, green infrastructure development from the government side can remarkably influence the green transformation and sustainability of this sector.

Further, five key initiatives - raising green awareness among the buyers and entrepreneurs, diplomatic initiatives for reducing barriers on collecting RMG raw materials and branding, research and development for the backward linkage, quota for green garments due to an uneven competition between green- and non-green RMG factory, political tolerance and stability for smooth production and transportation process are strongly recommended for the future sustainable growth of green garment factories.

In a nutshell, Bangladeshi garment entrepreneurs have accepted the *"Go Green"* idea as a role model. The future growth of the green garment factories is mainly dependent on a collective effort of producers, buyers, policymakers and a strong supportive role of the government.

## 8. EVALUATION OF THE RESEARCH

The descriptions of people, events and places are considered as the major issues for the reliability of the research in qualitative research (Hirsjärvi et al., 2001). Besides, according to Yin (2003), proper documentation and explanatory description are also very important for research. Therefore, the interview was recorded with the permission of interviewees to avoid error in the data collection, ultimately revealing and presenting the findings systematically.

Proper evaluation of the research depends on – how well the collected data describes the aspects of the targeted study (i.e., internal data reliability) and how accurate/ universal it represents the truth/findings from the data (i.e., external data reliability) (Alkula et al., 1999).

The study aims to explore the motivational factors and challenges for green garment factories in Bangladesh. For this purpose, 15 representatives from the mid- to upper-level managerial personnel were interviewed to know what the main motivating factors and challenges are in transforming into the green garment in Bangladesh. Additionally, what types of supports they get from the buyers and government and what else they are in need of these parties. Finally, it was what are the measurements need to be taken for sustainable green garment industry. Therefore, the questionnaire reflects the focusing of the studies. Importantly, the answers came from the experienced experts of this sector. Therefore, it is realistic to make a universal conclusion based on the findings which validate the reliability of the research.

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