DEVELOPMENT OF SUSTAINABILITY INDEX FOR READY-MADE GARMENTS SECTOR IN BANGLADESH

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ABSTRACT

Title of Dissertation	Development of Sustainability Index for Ready-Made Garments Sector in Bangladesh
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The aim of this research is to develop a simple and easily useable scale to assess sustainable development in the ready-made garments (RMG) sector of Bangladesh. To pursue the goal, this study is divided into two separate parts; index development and sustainability assessment. Based on an extensive literature review, a three-dimensional framework has been proposed. Dimensions include economic, social and environmental dimensions. Data were gathered from the Tier 1 RMG factories in Bangladesh. Excluding incomplete responses, a total of 238 responses were considered for further analysis. The statistics used in the analysis were item-total correlation, independent t-test, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) through structural equation modeling (SEM). The result revealed that a 30-items index showed model fit on the proposed second-order sustainability index model. Dimensions of sustainability are found to be well correlated and dimensions as well as sub-dimensions of sustainability load very well on the proposed three-dimensional model. In the second part of this study, level of sustainability of the ready-made garments factories has been assessed based on the developed sustainability index and the modified scale of a sustainability tool named Barometer of Sustainability. Overall sustainability level of the factories participate in this study is at "acceptable" level. Classifying the factories based on their product types does not show much difference than the overall sustainability measure. But while factories are segregated based on their sizes in terms of a number of employees,

the result shows a clear inverse relationship between sustainability level and RMG factory sizes. Sustainability index developed in this research will help all the interested parties including government, factory owners, business associations and international buyers, to assess and monitor sustainable development in this sector. Proper use of this index could help RMG factories in Bangladesh to overcome the difficulties they face in regard to sustainability. Additionally, the index could also serve as a base for similar scales in other industries.

ACKNOWLEDGEMENTS

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ABBREVIATIONS

Abbreviations	Equivalence
AGFI	Adjusted Goodness-of-Fit Index
AMOS	Analysis of Moment Structures
BGMEA	Bangladesh Garment Manufacturers and Exporters Association
BKMEA	Bangladesh Knitwear Manufacturer and Exporter Association
CFA	Confirmatory Factor Analysis
CMin/df	Minimum Discrepancy
COC	Code of Conduct
CS	Corporate Sustainability
CSR	Corporate Social Responsibility
DIFE	Department of Inspection for Factories and Establishment, Bangladesh
DJSI	Dow Jones Sustainability Index
EFA	Exploratory Factor Analysis
EMS	Environmental Management System
EU	European Union
FP	Financial Performance
GATT	General Agreement on Tariff and Trade
GFI	Goodness-of-Fit Index
GRI	Global Reporting Initiative
HDI	Human Development Index
HRD	Human Resource Development
IOC	Item Objective Congruence

ISO	International Organization for Standardization
IUCN	International Union for Conservation of Nature
MFA	Multi-fiber Agreement
NGO	Non-Government Organization
OECD	The Organization for Economic Co-operation and Development
RCM	Risk and Crisis Management
RMG	Ready-made Garments
RMR	Root-Mean-Square Residual
RMSEA	Root-Mean-Square Error of Approximation
ROA	Return on Assets
SCM	Supply Chain Management
SD	Sustainable Development
SEM	Structural Equation Modelling
TBL	Triple Bottom Line
UN	United Nations
WP	Workplace Management

CHAPTER 1

INTRODUCTION

There is only one alternative to sustainability: Unsustainability

-Hartmut Bossel, 1999

This chapter gives an overview of the whole dissertation, starting with a rationale of the study followed by industry description, research purpose, and methods. It briefs the purpose of the study which contains research questions and objectives. It further gives an idea of research development and process to pursue the research objectives.

1.1 Rationale of Sustainable Development

From the dawn of civilization, human beings have been trying to improve their circumstances. We, the modern civilized people, are the result of that relentless effort. We have gained from tremendous technological advances which have made every aspect of our lives easy and comfortable. Agricultural development has increased multiple crops to feed our people, industrialization has helped hundreds of thousands of people to find employment, modern transportation system reduces distances significantly, the communication system enables us to communicate with anyone from any corner of the world, new drugs heal diseases which were beyond our imagination, and TV, cooling/heating systems, and other entertainments make our lives enjoyable. In other words, development has benefitted our lives.

Roughly every twenty years, the world's economy doubles, and the population doubles every half century, but natural resources are not growing (Meadows, 1998). But in the process of developing ourselves, we are exploiting natural resources, which

have endangered the world's ecosystem. Development is a continuous and indispensable process, a fact that we cannot deny. Now, the question is how can we continue our development process without doing any harm to the ecosystem and our healthy social lives? To find the answer to these issues, the term 'sustainable development' or 'sustainability' has emerged. Nowadays, the biggest businesses in the world, such as Toyota, Honda, GE, Puma, Unilever and so on, are keen to transform their businesses into green ones. (Benn, Dunphy, & Griffiths, 2014).

To proceed to sustainable development, the degree of sustainability should be measured first. To measure this, we need to have proper indicators. As the nature of change is not the same throughout the world, it is hard to frame common sets of indicators for all. Since the governments of the world and the UN are encouraging sustainable development, most of the measures have been developed to assess sustainability at national, regional or communal level. Although some frameworks include an 'institutional' level of assessment, as the UN has directed (UNCSD, 2001), far less work has been done to assess sustainability at the organization level (Veleva, & Ellenbecker, 2000). Thus, the author of this paper has built a framework for the sustainability of a specific sector of a specific country, where such development has become urgent.

1.2 Ready-Made Garments (RMG) Sector Overview

In the late seventies, the export-oriented apparel industry or ready-made garments industry (RMG) started their journey in Bangladesh. With the help of the guaranteed customer through the Multi-Fibre Agreement (MFA) of GATT (General Agreement on Tariffs and Trade), entrepreneurs took the opportunity to boost their businesses, and the Bangladeshi government helped them duly at that time. In the four decades since then, the RMG sector has become a leading export earning sector for the country, contributing to almost 80% of the total export. The growth in the export market was US$ 12 million in 1984/85 increasing to US$ 21.5 Billion in 2012/13. Currently, there are around 4500 big, medium and small garments industries and almost four million people working for them (Export Promotion Bureau, Bangladesh, 2015).

The arrival of the garments industry reduced poverty significantly, from 70% during the late 1970s, to less than 20% currently. Not only has there been poverty alleviation, it has also increased life expectancy, literacy rates and per capita food intake. Bangladesh's economy has grown nearly 6% every year since the mid-1990s (World Bank, 2014). The ready-made garments industry did not exist during the independence of the country in 1971, but in the last four decades, it has become one of the leading apparel suppliers in the world. During the 1990s, Bangladesh supplied only 0.6% of the total of apparel products throughout the world, and it rose to 5% by 2011 and that share is consistent until now (International Labor Organization, 2013). Besides significant economic growth, it shows a significant human development and empowerment of women.

Although the country has seen a booming growth in the industry, and development of the economy and workforce, some issues have been observed and noted. Exploitation, social degradation, environmental pollution and so on are the residuals of this development. Hundreds of people have died as a result of some accidents during last few years. There was a fire in Tazreen, and a building collapsed in Rana Plaza. Moreover, employee unrest is very common in this sector. By not following the ILO's convention, the country's existing law is believed to be the major reason for such incidents (Yunus, & Yamagata, 2012). Very often, human rights' issues are questioned in this sector as the discussed sector pays one of the lowest wage rates in the world (Salam, & McLean, 2014). As this sector proved to be very important for the economy and employment of this overpopulated country, survival and sustainable development in this sector has become a current issue.

Furthermore, there is a new worldwide trend for 'sustainable fashion,' especially in developed countries, who are the major buyers of RMG products from Bangladesh. The term sustainable fashion is defined as the production and distribution of clothes/garments following fair trade principles, which are environmentally and labor-friendly, do not use hazardous chemicals and other harmful materials, do not exploit workers, follow an ethical code of conduct and use recycled materials as much as possible (Fletcher, 2008; Joergens, 2006). Hence, sustainable fashion covers both ethical (sweatshop-free fashion) and environmental (green fashion) aspects of sustainable development. Sustainable fashion and/or eco-labelling have a competitive

advantage in this industry. Therefore, to survive in the race, the industry must address this issue. Yip (2010) pointed out five criteria for sustainable fashion, such as locally made, ethically produced, using recycled materials, using organic and naturally processed materials and long-lasting. Therefore, the concept of sustainable fashion addresses all the criteria of sustainability in the RMG sector.

As discussed above, sustainability has become important both locally and internationally in the ready-made garments sector. Moreover, to ensure healthy growth of the sector, close monitoring of social and environmental activities is important. Thus, this study considers developing an effective method/scale to measure sustainable development in a sector that proved to be the life-blood of Bangladesh's economy.

1.3 Purpose of the Study

The main objective of this study is to develop a sustainability index for RMG sector of Bangladesh. Therefore, the first concern of this study is to figure out RMG industry-specific sustainable development (SD) indicators of all three aspects of SD, economic, environmental and social, based on previous literature.

As existing sustainable development scales do not provide unidirectional assessment or "simple measurement of SD", an effort has been given to create a simple but representative scale and assessment framework for sustainable development in the ready-made garments sector of Bangladesh. Later this study also measures the level of sustainability of the RMG factories of Bangladesh using the developed method.

Thus, the objectives of this study are two folds:

1) To develop a simple and easily usable sustainability index and methodology by comparing and contrasting existing as well as proposed sustainability assessment methods. As this study is dealing with a specific sector of a country, more insight into the assessment tools are needed to segregate and modify them accordingly. The proposed index would be tested quantitatively by collecting information from a number of companies.

2) To assess the level of sustainability of the RMG factories by using scale and method developed in this study.

So, the research questions derived from the above-mentioned research objectives are:

1) How could existing sustainability assessment methods be mapped to understand more about sustainability and to compare and contrast them to develop a representative index for RMG sector of Bangladesh?

2) To what extent are the dimensions of sustainability fit into the overall index and related to each other?

3) To what extent are the RMG factories in Bangladesh sustainable?

1.4 Research Methods

This research based on a questionnaire survey. To develop the questionnaire, an in-depth literature review has been conducted first. A literature search is conducted by the combination of terms such as sustainable development, corporate sustainability, TBL, corporate social responsibility, ready-made garments sector, sustainable fashion and so on. Based on this extensive literature review a basic framework (index) has been proposed along with dimensions and indicators. Later, that index is tested by a questionnaire survey.

A two-tiered data collection has been occurred to test the developed index through literature review. At first, a pilot test is conducted to test primary validity and reliability of the questionnaire. Later survey questionnaires are distributed to RMG factories situated in different cities in Bangladesh. Through quantitative data analysis, a representative sustainability index is established. The proposed framework developed from the extensive literature review has also been fine-tuned based on the findings of the data analysis. Using that fine-tuned sustainability index, level of sustainable development in the ready-made garments sector of Bangladesh is assessed.

The following figure explains step-by-step development and approach to this research.

| Step 1 | Step 2 | Step 3 | Step 4 | Step 5 | Step 6 |

Step 1

Thorough review of sustainable development, corporate sustainability and corporate social responsibility

Review of Ready-made garments (RMG) sector, world fashion trend and Bangladesh's RMG sector literature.

Critical and creative thinking

Step 2

Determine indicators of sustainability and an index for assessing sustainability in the RMG sector of Bangladesh

Step 3

Testing proposed sustainability indexes by gathering data from Bangladesh's RMG factories

Step 4

Fine tuning of the proposed index after data analysis to fit with the discussed sector and measure reliability of the index

Step 5

Assessing level of sustainability by using special tool developed in this study

Step 6

Address limitations of the index and difficulties of assessment. To suggest further research based on the limitations.

Figure 1.1 Research Steps

1.5 Contribution of This Research

Traditional business philosophy of corporate world is investment and innovation drives economic growth and consumer satisfaction and that is the major purpose of the businesses to serve (Welford, 2013). As this corporate view has become somewhat destructive for the environment and society in one form or other alternative approaches of "corporate view" is inevitable (Welford, & Gouldson, 1993). Welford (2013) also emphasize that growth is justifiable only if it comes along with development. Development, unlike growth, does not consider only increase in size of specific areas, rather ensures equity of all the involved fields.

It is easy to measure the financial growth of business firms by numbers but it is quite difficult to assess the impact of that business on environment and society. This dissertation serves as an approach to measure sustainability in the ready-made garments sector of Bangladesh. Sustainability indexes proposed in this study not only measure environmental and social impacts of the business but also focus on the economic and ethical phenomena which cannot be measured by numbers or have been neglected as development criteria.

Furthermore, government regulations, local and international laws are forcing business to leave unsustainable ways of production. Besides, competition in the industry is also driving businesses to be innovative where sustainability could give them a comparative advantage along with a lead in "green tag" trend (Gabel, & Sinclair-Desgagne, 2001).

CHAPTER 2

LITERATURE REVIEW

This chapter will explain definitions and concept of sustainable development from different schools of thoughts' point of view. It also provides a brief comparison and contrast among different concepts of sustainability existing in the scholar world and relates that with ready-made garments sector. Furthermore, this chapter explains three dimensions of sustainability and their indicators. Purpose of this chapter is to discuss how sustainability is found in the literature and built a framework based on that extensive literature review.

2.1 Defining Sustainable Development

The term sustainable development literally means to be able to maintain progress and to be accepted over time. However, it was defined differently in different sectors to fit users' purposes. By early 1990s, more than seventy definitions of sustainable development were discovered by Holmberg and Sandbrook (1992). Although there are a number of definitions for this term, the Boston Consulting Group (BCG) discovered that two-thirds of sustainability experts, who are mainly business leaders, define sustainable development using the Burtland Commission and/or the TBL definition (BCG, 2009).

The history of sustainable development literature is deep-rooted, and one of the early writers is Rachel Carson. Her book, Silent Spring (1962), first brought the relationship between environmental, social and economic wellbeing together. This book is believed to be one of the milestones of sustainable development literature (IISD, 2010). However, probably the most accepted and popular definition of sustainable development is given in Brundtland's 'Our Common Future' report,

(WCED, 1987), which states that sustainable development is a process which considers both the present and future while developing.

It is worthwhile mentioning here that the concept of sustainability was adopted from agro-biology; and the term was defined as a system capacity to maintain productivity even in an adverse situation (Jimenez-Herrero, 2000). This is also true for realities other than agriculture, as we have to grow and sustain even though we are facing difficulties, challenges and unfavourable conditions in the real world. The word sustainability and sustainable development are used synonymously in this research like most of the scholars in this field, but some other distinguish between these two terms like Munc and Borim-de-Souza, (2009, cited in Balbinot, & Borim-de-Souza, 2012). According to them, sustainability indicates maintaining something in a continuous state. Sustainable Development refers integrative process that tries to maintain a dynamic balance within a complex system over a long period of time. Either similar or not, both the term are related to development, now the question arises, what consists of development? Although development mainly refers financial development and growth in the resources; people are considered the major field to develop. As economist E. F. Schumacher (1973, p. 140) in his famous book Small is Beautiful argues, "Development does not start with goods: it starts with people and their education, organization, and discipline. Without these three, all resources remain latent, untapped, potential." This statement fits best in the field of HRD, as HRD scholars, people are the main concern, and without developing them any development comes to no use. In that case, we need a proper definition of sustainability for HRD. As HRD scholars are concerned about this issue for the last couple of years, we can have a handful of them. According to Docherty et al. (2002), sustainability encompasses three levels: individual, organizational and societal. Sustainability at one level cannot be achieved by exploiting others because all these levels are closely related to each other and to the organization's stakeholders (i.e. personnel, customers, owners, and society).That means we need to balance the level of development among individuals, organizations, and society. Achievement of sustainable development is not possible if one of them is ignored.

Some of the most used and related definitions of sustainable development are explained below:

2.1.1 Brundtland Commission

In 1987 United Nation formed a commission named Brundtland Commission to assess the upcoming sustainability crisis of the world. That commission submitted a report named "Our Common Future", where they defined sustainable development which is the most frequently used definition of this term (Pinter, 2013). It states,

> Sustainable development is a development that meets the needs of current generations without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:
>
> The concept of 'needs', in particular, the essential needs of the world's poor, to which overriding priority should be given; and
>
> The idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs. (WCED, 1987, pp.41)

Since Brundtland Commission's report, there are few shifts came in the Sustainable Development literature; one prominent shift could be Sustainable Development to sustainability. Another major shift could be changing focus from needs of poor to the environmental development and overall social wellbeing. Barkemeyer et al. (2014) explain this shift as the result of growing concern over the issues like climate change.

Although the Brundtland commission report does not clarify the concept of sustainability in terms of measurement, it still serves as the base of almost all the sustainability research. After a couple of years of Brundlandt commission report, one major effort is observed to define sustainability by US National Academy of Sciences (National Research Council, 1999). Following Brundtland report, the name of its report was "Our Common Journey: A Transition towards Sustainability." Figure 2.1 depicts the definition framework of that committee.
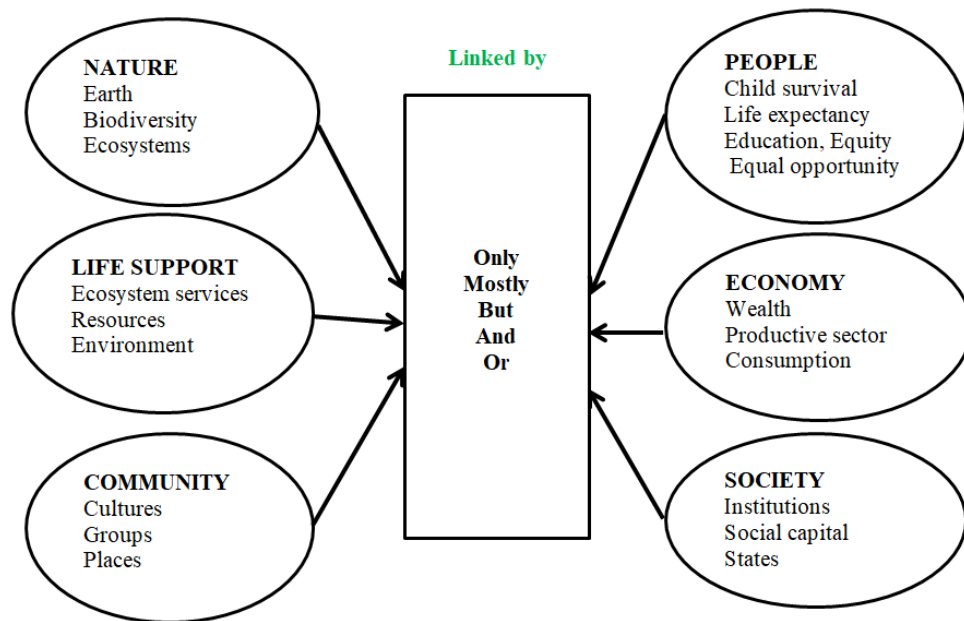
Figure 2.1 Sustainability Concept of USNRC

The committee identified two separate areas to focus namely "what is to be sustained" and "what is to be developed". It identifies three major areas to sustain, such as nature, community and life support system. Here life support system includes sub-categories like ecosystem services, environment and so on. To sustain all three categories the committee figures out that the US has to develop three major areas, those are people economy and society. "People" in this definition refers to the well-being of the citizens which includes life expectancy, education, equality and so on. Society had been separated there from people; "Society" in this definition refers to institutions, regions (or states) and so on (National Research Council, 1999). This definition later serves as the basis of sustainable development of many countries.

2.1.2 Triple Bottom Line

Triple Bottom Line (TBL) is the commonly used sustainability definition among corporations. It is one of the pioneers in corporate sustainability measure. This approach materializes Brundtland Commission's proposal for the business world. The major success of this approach is to determine three dimensions of sustainability. John

Elkington in his famous book Cannibals with Fork (1997) expresses concern about the misunderstanding of the companies of sustainable development from Brundtland Commission Report (Our Common Future). He also points out the lack of direction for the corporations to contribute towards sustainable development. Therefore, he came forward with the issues organizations needs to address for sustainable development. He mentioned three dimensions of sustainability as three bottom lines of the sustainability process, which are interdependent. Bottom lines are compared to as moving continental plates as three dimensions fluctuate independently and by some other forces like political pressure (Elkington, 1997). He first brought all three aspects of sustainability together to hypothesize the modern measure of sustainability (Jamali, 2006). Many research (including this study) are based on Elkington's three dimensions or pillars of sustainability. Elkington emphasizes on socially and environmentally responsible behavior by corporations to achieve financial benefit as well as overall improved performance (Gimenez et al., 2012). Globally accepted and detailed measure of corporate sustainability named GRI (Global Reporting Initiative) is based on the pillars of Elkington's TBL. Some also opine that as the best existing method to measure sustainable development (Archel et al., 2008).

The core philosophy of TBL approach is to incorporate social and environmental responsibility into business practice and to align them with the financial goals of the business. The idea behind such alignment is to achieve improved performance and value creation for all three aspects (Gimenez et al., 2012). This framework serves as the basis of sustainability reporting using these three pillars or "bottom lines" (Jamali, 2006).

Financial benefits of environmental and social sustainability activities often surprise businesses as they believe that sustainable development would reduce their financial gains (Bansal, 2005). TBL helps in this regard. It serves as a strategic tool that helps businesses to emphasize on all three pillars simultaneously and embeds them in the business policy to have a single goal (Mowat, 2002, Jamali, 2006).

Sometimes TBL is compared with 3Ps (Profit, Planet, and People) and Balanced Scorecard (Hindle, 2009) as an accounting tool to measure and report sustainability.

Unfortunately, TBL is not beyond criticism. The main criticism of this approach is that it is quite abstract and difficult to implement. There are no proper guidelines how three dimensions should be measured and balanced simultaneously with each other (Lozano, 2012). Some other researchers showed that TBL is failed to set up proper boundaries for reporting which could pose a threat to companies to lose reputation (Archel et al., 2008).

2.1.3 Sustainable Fashion

As this research focuses on garments industry a look into the definition of sustainability in the fashion industry is also need. Sustainable fashion has become a new trend nowadays. People tend to buy clothes which contain an eco-label. Sustainable fashion can be defined as clothes come through a process which does not exploit labor (sweatshop), does not use chemicals and materials which are harmful to nature and human, follows ethical standards, uses recycled materials and lasts long (Shen et al., 2014; Joergens, 2006).

2.1.4 Corporate Social Responsibility

There is an unwritten or untold agreement between business and society. Businesses are expected to supply goods and services needed to the society by using scarce resources efficiently. In return, businesses earn a profit and there is no conflict between earning a profit by the business and using the available resources of the society. But the problem arises as there is no certain measure to balance between these two activities. When profit-seeking surpasses social well-being or profit comes at the rate of long-term social damage there creates an imbalance. To rebalance this society-business relationship the term CSR came into the scene. So, in short, CSR is a commitment from the business that their current profit objective would not come at a cost of damaging society in the long run (Cadbury, 2006).

There are numerous definitions of CSR and yet to find one accepted by all. Generally, CSR is defined as the voluntary activities of integrating social and environmental concerns in business operations by corporations (CoEC, 2001). Interestingly while defining CSR World Business Council for Sustainable Development emphasizes on the voluntary commitment by the organizations to

improve the quality of social life (WBCSD, 1999). The WBCSD believes that CSR is "the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large" (Watts, & Holme, 1999, p 3). In this definition, CSR is seen as a "commitment" which should be done voluntarily. A more precise definition comes from Kramer and Porter (2006), according to them CSR should be justified from four points of view such as moral obligation, sustainability, license to operate and reputation. In this definition, sustainability refers to environmental aspects. This definition shed a new light on the CSR literature as it aligned legal/legislative issues along with moral issues. By license to operate the authors meant to get permission from authority to operate by promising that the business would not harm the society.

Whatever the definition the scholars are agreed on one point that CSR is a voluntary and optional activity of the businesses. Mostly, this is not abiding by the law, hence, the organizations are not obliged to follow any standards set of CSR activities.

2.1.5 Corporate Sustainability

Primarily the term corporate sustainability coined to indicate sustainable development in the corporations. Hence, the definition of Brundtland commission modified to fit corporations need. Adopting Brundtland commission's definition corporate sustainability is defined as meeting demand/needs of current stakeholders without compromising (the ability to meet) needs of future stakeholders (Dyllick, & Hockerts, 2002; Artiach et al., 2010). Here stakeholders may include shareholders, employees, clients, local communities, suppliers, and so on (Dyllick, & Hockerts, 2002).

DJSI (RobecoSAM, 2013) defines corporate sustainability as a "business approach." In this approach, businesses try to maximize stakeholders benefit by carefully choosing opportunities and avoid risks arise from all three aspects of sustainable development. DJSI's main concern was businesses in its definition. Very often researchers disagree with this view of corporate sustainability. Van Marrewijk (2003) opines that corporate sustainability (CS) and corporate social responsibility

(CSR) could be used inter-exchangeable. To do so he suggested five major categories of corporate sustainability such as:

    1) Compliance-driven CS

    2) Profit-driven CS

    3) Caring CS

    4) Synergistic CS

    5) Holistic CS

Above mentioned definitions indicate that unlike national sustainability, corporate sustainability extended its area by adding some other ethical and management consideration. Suzanne, Dunphy, and Griffith (2014) in their famous book "Organizational Change for Corporate Sustainability" considered ecological sustainability, CSR, leadership, community and so on in the scope of corporate sustainability.

2.1.6 Relationship between the Sustainability Concepts

The aim of this paper is to assess sustainable development in the ready-made garments sector of Bangladesh. As issues discussed in the research is somewhat confusing and defined separately in different sectors, the author tries to find similarity and differences between the terms used in this regard. Here SD refers to the pure UN views to the Sustainable development mainly based on Brundtland Commission report, whereas CS defines the sustainability exclusively in the corporations (here focus is only on RMG sector) and TBL is Elkington's three dimensions view which later modified and called 3P as well.

The original idea of SD given in Brundtland report suggested two major issues to be concerned with, i.e., needs of world's poor and environmental exploitation. This report did not focus on any specific group or sector rather addresses all human being of the world. Therefore it is a general view which failed to provide any direction for different organization and sectors responsible to implement sustainable development. Steurer et al. (2005, p.270) believes that corporate sustainability is an extrapolation of SD, same three component core structure including second-order issues such as: "transparency and participation, reflectivity, integration and intergenerational equity." They further explain CS as the adoption of

business planning, strategies, and activities that important for meeting the needs of business and its stakeholders while considering the interest of external human, nature and social resources.

On the other hand, CSR is defined as the business strategy that integrates environmental, social, ethical and human rights issues with the collaboration of other stakeholders (EC, 2011). Although some authors use CSR synonymous with CS (Van Marrewijk, 2003), some others distinguish it. Steurer et al., (2005) pointed out that CSR is mostly a stakeholder-oriented process while lacking the long-term orientation of corporate sustainability. During the early age of CSR, it also considered as a philanthropic activity of a corporation, which is still practiced in some areas of industrialization, another major difference between CSR and CS.

The relationship between CSR, CS, and TBL could be further explained by the figure drawn by Van Marrewijk, (2003).
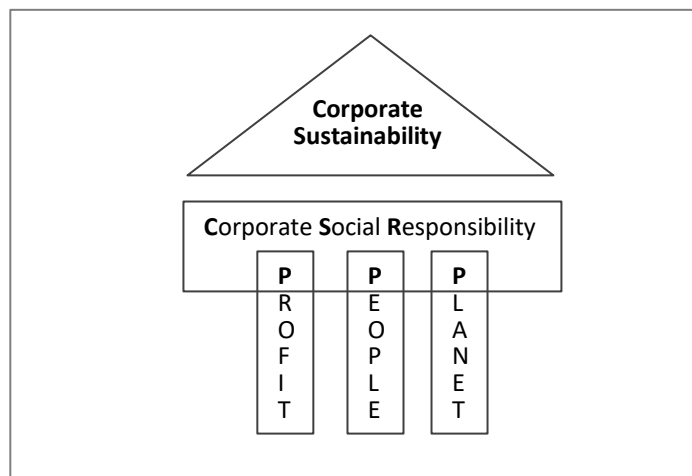

Figure 2.2 Relationship between TBL/3P, CSR, & CS.
Source: Adapted from Van Marrewijk, 2003.

He stated that the comparison starts with TBL which is depicted as three pillars (3Ps-profit, planet, and people), whereas CSR is a strategic approach to integrate three pillars and incorporate them in business activities and CS is the final stage where this process matures.

2.2 Role, Importance, and Drivers of Sustainable Development

2.2.1 Corporations' Role in Sustainable Development

To develop sustainably all the role players in the society has to take part actively as everyone has their own responsibilities. Some authors (such as Deutz, 2009; Hoppe, & Coenen, 2011) classify these role players into three major groups, government, consumers, and producers. This research focus on the producers' side, hence, the role of corporations would be discussed here.

Corporations have a major responsibility in the sustainable development of the society; their part in this process is regarded as their own sustainable development. It comes in a form of reducing negative impacts of emission, exploitation of natural resources, bad practices in financial activities, unhealthy employee treatment and so on. Some argue that corporations' responsibility is not only reducing/ eliminating negative activities but also turned them into positive ones (Elkington, 1994; Hardjono, & de Klein, 2004). On the continuation of this process, European Union (EU) implemented some regulations of curving unsustainable activities such as packaging waste, end of life vehicle, waste electronics and electrical equipment and so on (Deutz, 2009). Government regulations, environmental and human rights organization might pressure companies to follow the regulation and develop sustainably. Besides market pressure also regulates corporations to play a role in sustainable development; the example of this could be big corporations like Exxon, Nike, and Pfizer, companies who adopted sustainable production and distribution behavior on the reputational ground (Maon et al., 2009).

From the early 90s of last century, a trend is observed in the business world which is a major shift in policymakers' mindset. Corporations have become more long-term oriented instead of short-term profit oriented in the field of environment and labor practice. Limiting or eliminating negative externalities become a new positive competition among the companies (Jamali, 2006). Concept of stakeholder wellbeing has gained enormous attention during this period which is increasingly being embedded in organizations responsibility (Diesendorf, 2000)

As sustainable development has also transposed to the manufacturing sector, as many other sector and area of study (Garetti, & Taisch, 2012), a new term

corporate sustainability (CS) is emerged to address this issue there. Dyllick and Hockerts, (2002) define this term following Brundtland report as meeting the needs of current stakeholders without compromising the needs of future stakeholders (here stakeholders are employees, clients, pressure groups and so on). On the contrary Perrini and Tencati, (2006, p. 296), interpret this as "the capacity of a firm to continue operating over a long period of time." Although above mentioned two definitions seems different as they focus on corporate sustainability from two different points of view, both have similarities in one point. Both the definition focus longevity of the business, if the environment (both natural and manmade) around the business is not same or sound, the business or corporation cannot operate and survive.

2.2.2 Sustainable Development in the Ready-Made Garments Industry

Industrial sector needs to take corporate sustainability seriously as it is blamed for being the major source of environmental and social degradation. Corporations have to address this responsibility by assessing and reporting the social and environmental impact of their day to day activities (Azapagic, 2003; Azapagic, & Perdan, 2000). It is also important for their own development as the recent studies suggest that a number of the companies regularly report progress in sustainable development has increased geometrically (Hubbard, 2009; KPMG, 2011; Lozano, & Huisingh, 2011; Schneider, & Meins, 2012). In 1993, when the world was literally waking up from a long sleep, only one out of ten top companies report their corporate responsibility as revealed in the first KPMG survey of Corporate Responsibility Reporting. After twenty years, in December 2013, KPMG survey reports that 71 percent of the top listed companies report corporate responsibility, which is almost three quarters. The rate of reporting has increased in Asia Pacific zone more than any other part of the world, within two years the rate increased around 25 percent.

As being sustainable becomes a new trend all over the world, consumers are being conscious gradually about this issue. Boston Consulting Group (BCG) in their 2014 report states that sustainability is a new consumer value, especially among the luxury customers. To meet the demand of sustainability aware customers, business should focus on sustainability issues. Like food industry, where the concept is well established and widely accepted, brought organic food to meet conscious customers

need and it has become a mainstream activity of the industry (Ritch, 2014). Eco-labelling is a similar concept in the fashion industry. People tend to buy eco-labeled cloths as they feel the responsibility towards environment and society. Definition of sustainable fashion has mentioned above. Since the term and its measurement is somewhat ambiguous, companies define and measure sustainability at their convenient way (BCG, 2009). As a result best practice of sustainability depends on few factors such as the type of product, organization structure, customer mindset and so on. To find the solution Joergens (2006) suggested companies to provide information to the customer how to choose a sustainable product. Although it has become a new trend in the fashion industry, there is no set standard from any side.

2.2.3 Drivers for Sustainable Development in Companies

After discussing definitions, types, importance of sustainable development the ultimate question is why companies would work for sustainability or why would they follow sustainable guidelines. There are different opinions on this issue; definitely, laws imposed by governments compel companies to behave sustainably but that is not all. According to Campbell (2007), there are seven factors that influence the responsible and sustainable behavior of the companies, such as:

1) Financial health of the company and world economic trend

2) Competition in the industry (too much or too little)

3) Government regulations

4) Effective self-regulation

5) Civil society pressure (may come in different forms such as NGO, press, and so on)

6) Publications and/or new management thoughts reaching executive level

7) Membership of the organization that encourages sustainable behavior

Although this list brings many important factors, it is not an exhaustive one. In fact, there is no "one size fit-for-all" list of factors or drivers of sustainable behavior. It varies greatly from sector to sector, country to country, even organization to organization.

However above mentioned drivers are external ones while there are some internal drivers that motivate corporations to become a sustainable one. Very first one comes in this regard is the financial benefit of SD. There is a huge debate on whether SD brings financial benefit or not or even it brings, to what extent, i.e., does it pays off the cost of following the regulations or behave sustainably. There is huge disagreement among the academics about the economic values of sustainable development (Ameer, & Othman, 2011). Not only academics but also practitioners are not quite convinced about the profitability of implementing sustainability. Gaspar (2013) in his article has shown this debate graphically; the following figure also illustrates that positive relationship between sustainable development and financial benefit is dominantly recognized by both academics and practitioners. Surprisingly more practitioners (78%) than academics (60%) believe in the financial benefit of SD.
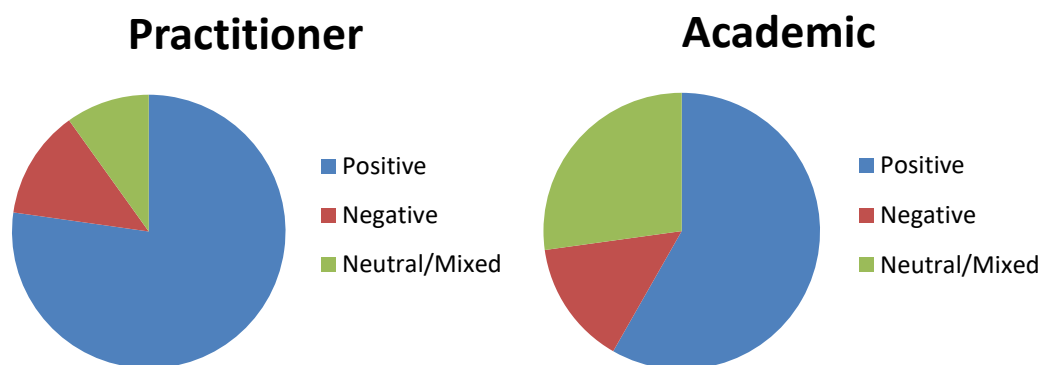
Figure 2.3 Perception of Financial Benefits of Sustainability

Beside financial profitability, there are some other perceived or observed benefits of SD are noted by researchers. Some of them are directly related to the financial benefit, some are indirectly related and some others are not related to any financial benefits. Some of the other benefits are saving cost by increased productivity and cleaner production, lower health and safety cost due to fewer accidents and healthy life of employee, reputational gains, increased ethical investors (Azapagic, 2003); increased employee satisfaction and motivation, risk minimization and increased resilience, better market position (Jenkins, 2006); internal as well as

external transparency (Ameer, & Othman, 2011); competitive advantage by greener innovation (Bonini, & Gorner, 2011); and increased shareholder and stakeholder values (Daub, & Ergenzinger, 2005).

But all these benefits of SD would be viable to businesses only if benefits pay off the cost of implementing SD policies. Ameer and Othman (2011) emphasized from their detailed study's result that financial performance plays the vital role in sustainable development. They have measured ROA of the companies and discovered that companies carried out sustainability practice have better financial performance than the ones do not maintain sustainability in their regular activities. They also figured out that the positive relationship between sustainability practice and financial performance getting stronger since 2006 and onwards.

2.3 Indicators

2.3.1 Definition of Indicators

Indicators defined in many ways in different contexts. Gallopin (1997) defines indicators as value, measure and statistical measure or a proxy for a measure, index or fraction. Veleva et al. (2001) opine that indicator can be numbers, facts, opinion or perception that provides information of any physical, social or economic system. Indicators generally measure something that cannot be measured directly but needs to measure using something. OECD (1993) illustrates that indicators are parameters or values derived from parameters to provide information about or to describe the state of phenomena, condition or environment.

Most of the times data itself cannot interpret anything unless it is used as a basis for some indicators (Segnestam, 2002). Data are the real measurement or observation and indicators are the variable depending on that actual measurement or observation (Gallopin, 1997). Indicators are combined sometimes to achieve higher order variables such as HDI. Whenever measurement of one indicator does not make sense for specific research, two or more variables are combined.

Although quantitative indicators are used widely, indicators could be both qualitative and quantitative.

2.3.2   Types of Indicators

Generally, indicators are divided into descriptive and performance indicators based on their function (Hardi, & Barg, 1997). Descriptive or system indicators measure the current happenings in the system by measuring different components of the system (or environment or area) (Hardi, & Barg, 1997). To explain in one word system indicators give us a picture what is the current state of the system (Smeets, & Weterings, 1999).

On the contrary performance indicators include the examination of changes in "development intervention", which indicates that this type of indicators measures changes in the system (OECD, 2002). In other words, performance indicators measure the performance of system indicators given their expected performance or goal (Hardi, & Barg, 1997). Therefore, performance indicators provide information for decision making.

Besides, EEA (European Environmental Agency) further introduces indicator type named efficiency indicators to measure whether the system is really improving or not. This type of indicators provides information of increased or decreased efficiency such as the ratio of resources used and emission generated (Smeets, & Weterings, 1999). According to the definition, it supposed to be measured by performance indicators but as data for output indicators are not easily accessible and comparable, efficiency indicators is a sensible way to measure efficiency in such cases (Atkinson et al., 2002; Zadek et al., 1997).

2.3.3   Characteristics of Good Indicators

Since the result of research and decision are made based on information provided by indicators, indicators should be chosen carefully. It should be made sure that indicators are accurately measuring what they are supposed to measure. To ensure the accuracy of collected information some criteria of indicators should be followed. Major characteristics of good indicators are stated below:

Table 2.1 Characteristics of Good Indicators

Characteristic	Details
Simple and understandable	Indicators must be simple and understandable to the people of different walk of life. Indicator should carry intended information to the subject/people: unknown technical term could be confusing and too general terms may not carry the meaning it wants to convey (Rice, 2003)
Relevant to the users	Selected indicators must be relevant to the users; they must measure factors influenced by users so that users have something to do with the problem (Segnestam, 2002). If the target users cannot find it related to them, indicators could give us misleading information. Units and contexts of the indicators must make sense to the users (Meadows, 1998).
Responsive to changes	Indicators have to be responsive to the changes (OECD, 1993). Selected indicators should not be too established rather open to discussion, criticism, and changes (Meadows, 1998)
Analytical soundness	Indicators should be analytically sound, i.e., theoretically well established in technical terms. Indicators should also be based on consensus about standard and validity (OECD, 1993)
Measurability	Data required for indicators should be readily available or available at an acceptable cost-benefit ratio (Gallopin 1997). It also should not be very time consuming (Meadows, 1998). It also has to be properly documented and of known quality (OECD, 1993)
Not too many not too little	Indicators have to be sufficient in numbers; too many indicators may cause data overload and inferior quality of data again too little indicators may not give enough information for decision making (Meadows, 1998)

Criteria for indicators explained above are the general rules; follow them strictly sometimes ended up in loss of important indicators. So, keeping criteria above as guideline careful consideration and balancing could give a proper list of indicators.

2.4 Measurement Methods Sustainable Development

Though sustainability is a major concern in many walks of life, there is yet to find any common standard to measure sustainability. Sustainability assessment itself is complex as many quantitative and qualitative criteria need to consider while measuring or assessing sustainability, some of which are difficult to measure. Hence, since the beginning, it is a challenge for the researcher as well as the practitioner to find a reliable set of standard to measure sustainable development. Businesses vary in nature as they have diverse activities; besides, different countries have different busyness style and policies. Therefore it is difficult to get the same yardstick to measure SD of all business (Goyal, Rahman, & Kazmi, 2013; Whitley, 1992). This fact inspires the author to find country and sector-specific scale and study to assess sustainability and to help the industry growing sustainability. Some researchers (like Salzmann et al., 2005) opine that country and sector-specific research in the area of SD could provide more accurate and reliable measure. This research looks into the ready-made garments sector of Bangladesh, which is one of the biggest suppliers of ready-made garments all over the world. Recently several accidents and negative reports make this sector position vulnerable in the world market. To grow sustainably and to gain back customers trust a proper framework and assessment is needed for this sector.

John Elkington's (1997) TBL is believed to be the first framework of sustainability assessment of the business. He first influenced the business leaders to move their focus from only monetary measure of the development to the overall development by including social and environmental dimension along with economic dimension in the sustainable development assessment.

There are many other methods introduced to measure sustainable development in the corporate sector; among them, ecological footprint (Rees, & Wackernagel, 1996) and the life cycle assessment (Rebitzer et al., 2004) are two very popular

methods. There is also criticism of using these methods; some believe that these methods only focus on the historical measure which is misleading in a current business situation. Furthermore, only environmental focus does not provide a complete assessment of sustainability (Barrett, & Scott, 2001; Fiala, 2008; Kicherer et al., 2007; Moffatt, 2000). Eco-efficiency is another measure which addresses some issues that are not considered in above-mentioned methods. WBCSD believes that eco-efficiency could be a good measure as it focuses on maximizing a company's economic value while minimizing the environmental impacts and use of natural resources (Lehni, 1998). This method also has drawbacks; it does not cover all the aspects needed to assess sustainability properly, especially variables of social dimension (Dyllick, & Hockerts, 2002; Isaksson, & Steimle, 2009). GRI (Global Reporting Initiative) is considered as one of the best of its kind (KPMG, 2011). Huge numbers of indicators added to address all three dimensions (economic, social and environmental) of sustainability. GRI indicators are widely used for sustainability assessment all over the world. But the number of indicators too big to handle; moreover, there is no clear instruction to measure and combine the indicators for a specific industry ((Labuschagne, Brent, & Van Erck, 2005; Lozano, & Huisingh, 2011; Panayiotou, Aravossis, & Moschou, 2009; Veleva, & Ellenbecker, 2001). It also claimed to be insufficient as it lacks customer focus and process orientation (Isaksson, 2004; Isaksson, & Steimle, 2009)

2.5 Dimensions and Variables of Sustainable Development

Sustainable development consists of development in three major areas, economic, environmental and social. From the Brundtland Commission Report (WCED, 1987) until now, researchers have rarely denied the reality of adding these three in sustainable development. Later Elkington (1997) in his famous book 'Cannibals with Forks: The Triple Bottom Line of 21st Century Business' brought the term triple bottom line (TBL), which gave ground for these three dimensions of sustainable development. In these studies, the author focused on the development of all three areas simultaneously.

Each of the three dimensions has several variables, and the number of variables varies from author to author, or context to context. Some variables are industry-specific and some are general (RobecoSam, 2013). Here, some variables are chosen which are suitable for the ready-made garments sector and accessible in the Bangladeshi context.

2.5.1 Economic Dimension

Economic capital has to be maintained sustainably because no business focuses on only short term profit as it instead focuses on gaining profits and surviving. This is also a core of personal wealth and/or economic conditions. This concept gets clearer by the income calculation definition of Hicks (1946, p.172). He defines peoples' earning as giving them, "an indication of the amount which they can consume without impoverishing themselves. Following out this idea, it would seem that we ought to define a man's income as the maximum value which he can consume during a week and still be expected to be as well of as at the end of the week as he was at the beginning." Although this definition focuses on personal income, it is also the major concern of businesses. It means the businesses should thrive at least at the same pace after sharing the profit with the stakeholders as it was before.

But profit sharing concept should not misguide us by giving an impression that economic dimension is all about money. Rather it is far from the traditional fixed capital and current operating capital calculation. Instead, this dimension seeks for the answer to the question "what did the organization earn during last month (or any other unit of time)." Now, this answer is not as straightforward as accounting calculation because "earn" does not count only monetary value or financial asset but also other economic capitals. Those are considered as economic capitals that make the gap between book value and market value wider. In other words, all the assets (or capitals) that help the organization maximize profit are considered as economic capital. This leads us to the concept of intangible assets such as intellectual asset, organizational asset and so on (Roos et al., 1997; Stewart, 2007). Hence, The monetary value of a company's assets gives us an idea about the firm's financial health but cannot inform us about the position in terms of economic sustainability. To know the economic sustainable position, one has to consider several capitals such as the current financial

capital, fixed tangible capital, intangible capital and so on. Intangible capital includes the reputation of the company, innovation practice, efficient management, ethical standards and so on.

The economic dimension of sustainability is closely related to the social and environmental dimension (WCED, 1987). For example, people looking for basic survival elements such as food, clothing, and shelter will use natural resources to fulfil their current needs at the cost of long-term destruction of the natural environment. And a society that is not able to provide economic security to its citizens ultimately compromises its own health and well-being (WBCSD, 2002).

For the purpose of this paper, the authors of this paper found some compatible economic variables both from the general and sector-specific pool, which are:

2.5.1.1 Risk and Crisis Management

Risk and crisis management is an important indicator of the economic dimension of sustainable development. Economic dimension does not only focus on financial growth or better performance but also focus on the long-term stable growth which consists of the elements like the ability to recover quickly, financial backups and so on (RobecoSAM, 2013). Areas to consider during risk and crisis management could be as follows:

1) Insurance against natural and other disasters

2) Basic coverage against income crisis

3) Safety net during the event of market crisis

Risk has always been a part of human civilization. It can be found in early civilization of West and East; early thinkers like Aristotle from West and "I Ching" from the east are two great examples of that (Borodzicz, 2005). Risk is defined by ISO as the mixture of probability and consequences of an event (ISO, & IEC, 2002), that indicates the chance of occurrence of some particular event and result of that. Although it considers both positive and negative consequences of any particular event, we focus here on the probability of negative results. There are several types of risks in the organization but those can be categorized into two major groups such as strategic level and operational level risks (Drennan, & McConnell, 2007).

Crises can be defined as a situation required a rapid response but it should not be confused with emergencies. Unlike emergencies, crises pose threat to the existing system, even sometimes dilemma in decision making (Borodzicz, 2005). Rosenthal (1996) sees more deep into it, he defines crises as a serious threat to the fundamental structure or basic values of a social system. This definition could also be applicable to the business world, which implies that crises could be a threat to the values or basic structure of the organization.

2.5.1.2   Compliance

Compliance describes the ability of an organization to act according to an order, set of rules or request. Compliance can be either external rules that are imposed upon an organization as a whole or internal system of control that is imposed to achieve compliance with the externally imposed rules (Ogbonna, & Harris, 1998). In the real world, it means both. In countries like Bangladesh, where anti-corruption laws are not properly implemented, companies are exposed to reputational and legal risks. Evidence of corrupt or illegal practice can result in exclusion from contracts financing authorities, international buyers, and overall international consumers.

Literature suggests that most of the garments factories in Bangladesh do not follow social and environmental regulations properly; as a result disallowing labour unions, unfair labour treatment, delaying salary payments, unhealthy working condition, disposal of hazardous waste in the public places and so on are very common occurring here (Rahman et al., 1999; ILO, 2004; Khan, 2006).

RobecoSAM adds compliance in the economic dimension of their sustainability measurement and importance of that in economic development is strongly supported by the literature above. If RMG factories fail to follow the regulations imposed by the international buyers, they might face financial loss even, in the worst case, may lose orders from international brands.

2.5.1.3   Supply Chain Management

A supply chain is defined as 'A set of three or more entities

(organizations or individuals) directly involved in the upstream or downstream flows of products, services, finances and/or information from a source to a customer' (Mentzer et al., 2001, p. 4). In light of this definition, supply chain management is defined as the coordination of business functions within any specific

company and across the businesses within the specific supply chain to improve the performance of both company and supply chain in the long run (Mentzer et al., 2001).

Supply chain even can exist without managing it, each component of the supply chain works as an individual entity, both inside the organization and external suppliers, if they are not managed properly performance of both side could be affected. The whole process is complex, so, the issue of accountability is also complex here.

Outsourcing of production, services or business processes comes with outsourcing corporate responsibilities and corporate risks. Hence, the companies need to find strategies to manage the associated risks and opportunities which are not same as in-house production risks and opportunities. Furthermore, the company is in the need of minimizing costs and time of delivery to satisfy the customers and increase profitability without negatively impacting the quality of the product or at high environmental or social costs.

This variable aims to identify sustainable supply chain management as an opportunity to improve the long-term financial performance of the garments' factories.

2.5.1.4 Financial Performance

The main objective of the profit-oriented businesses' organization is to earn money from the business and survive. The Caux Round Table believed that surviving is not the sufficient goal of the business but rather business should always be viable and in good economic health (CRT, 2009).

The economic dimension of sustainability mainly involved in the production and distribution of goods and services that will help to upgrade the standard of living (Schmidheiny, 1992). And this variable is directly related to the financial measure of an organization's current operation which determines whether the company will continue or not.

2.5.2 Environmental Dimension

Ecosystems are believed to have a limited regeneration capacity and our regular activities (including business, personal and so on) have every chance of impacting the environment negatively such as eroding land, air, and water (Bansal,

2005), decreasing biodiversity, deforestation, and toxic spills (Doering et al., 2002) and so on. Environmental sustainability is based on the concept that exploitation of natural capital cannot be continued forever (Lovins et al., 1999). Environmental or natural capital could be dividing into two major types: reproducible and non-reproducible. Reproducible natural resources are the ones which could be renewed such as wood, crops, fisheries and livestock and so on. Non-reproducible are the ones cannot be renewed such as fossil fuel, biodiversity and so on. Importance of environmental sustainability is understood by the term "industrial metabolism" (Ayres, 1989). Industrial metabolism compares industry with a living organism. Like a living animal industry consumes energy and resources and through processing, it creates desired and undesired output. Desired outputs are the products and services expected from that industry and undesired outputs are the waste, emission to air and so on (Ayres, 1995).

So, variables in this dimension represent the measurement of the consumption and pollution of the natural resources and the perception/awareness of that. Ideally, the variables have a long-range history of availability and could measure the impact of a specific project or industry in the environment.

Variables included here are:

2.5.2.1   Environmental Management System

As the concern over sustainable development growing all over the world, environmental management system became more and more important day by day. The customers nowadays are environment conscious; so, an environment-friendly tag on the product can change the game (Thomas, 2001).

The Environmental Management System (EMS) is believed to be one of the most used approaches to address the environmental bottom line. ISO 14001 framework has become so famous all over the world that it becomes synonymous to EMS. Since its publication in 1996 ISO 14001 got popularity among environmentally among organizations. Within only five years, in 2001, ISO 14001 is found to be used by 112 countries in the world (Ann et al., 2006). Elements of EMS include setting up an environmental policy with objectives and targets, adopting a program with a dateline to implement those objectives, measuring and evaluating the effectiveness of the program and reviewing it from time to time to match the program with the

organization's operations (Tibor, & Feldman, 1996). We need to keep in mind that EMS is a process standard or measure, not a performance standard.

Environmental Management System of any organization (here, sector) can be a good measure of the environmental sustainability of the product/process.

2.5.2.2   Energy Use and Emission to Air

Direct energy can come from sources including fossil fuels (e.g., coal, petroleum/oil, natural gas) burned on site to generate electricity, steam or heat. Emission to air makes the environment of the locality polluted by creating smoke, smog, acid rain, respiratory problems, blackening buildings and so on. There are some common pollutants such as sulphur dioxide (SO_2), Carbon monoxide (CO), nitrogen oxides (NO_x) and particulate matter (pm10) (Cole et al., 2004). Electricity generation by power stations is the primary source of SO_2, whereas NOx and CO are mostly produced by road transportation, industry and power stations (OECD, 1999). Hence, electricity generation by these facilities and bought electricity from a third-party power company could be harmful to the environment. Setting the record straight for electricity use could be a good way to establish an environmental measurement of sustainable development.   Energy use is directly related to the emission to air, furthermore, emission to air might come in the form of the non-processed smoke from machinery, uncontrolled use of biofuels, chemical clouds and so on.

2.5.2.3   Waste and Wastewater Management

This is a process for evaluating the use of different waste and wastewater treatment methods to understand a factory or facility's accountability towards the environment (Yoshida, Takahashi, Takeda, & Sakai, 2009). Industrial activities such as uncontrolled open dumpsites, poor sewerage system and open burning of waste create several health hazards due to pathogens, contamination of water, vermin and so on (Bogner et al., 2007). Sometimes due to relaxed government policy and/or implementation of environmental laws industrial waste neither collected nor managed.

Environmental consequences of poor waste management are well known but wastage of resources are often ignored. Most of the manufacturers overlook the resources they lose due to bad or inefficient waste management. Reduce,

reuse and recycle of waste might cut the cost of production, make the process and product greener and bring profit and reputation for the organization.

On the other hand, wastewater management ensures the quality of the wastewater thrown into public canals, rivers, lakes and other public water systems. It includes reducing suspended soils, biodegradable organics, pathogenic bacteria and nutrients (World Bank Group). Though wastewater management organizations make sure that their wastewater is not going to change the direction of the canal and river, it is important not to make a dead zone for fish by throwing BOD (biochemical oxygen demand) or dumping anything that could be hazardous for public health.

2.5.2.4   Chemical Management

This variable measures use and control of the use of harmful classified substances (here chemicals) (Valent et al., 2002). Some specific chemicals can be very harmful to biodiversity; use of such chemicals and intention to control usage of such chemical is an important measure of sustainable development.

Hazardous chemical, previously studied under hazardous waste, defined as the chemical that is flammable (having flash point less than 140 degree Fahrenheit), corrosive ($2>pH>12.5$), toxic (LC_{50} or LD_{50}), explosive or other characteristics, causes danger to health or environment, whether alone or when come into contact with other waste available (LaGrega et al., 2010). Management is needed to treat such hazardous chemicals, control use of those and replace those with organic one as those can pose threat to the human body, environment, and eco-system.

2.5.3 Social Dimension

Although it seems a very limited connection to business with social activities, it is important to measure and assess an organizations' impact on the social systems in which they operate, from the local to global level (Elkington, 1997). It could include measurements of education, equity, well-being, quality of life, access to social resources, social capital and so on. Some social issues such as sweatshops, child labour etc. occur due to cost-cutting efforts of the organizations and brands (Niinimäki, 2010).

Some argue that big names in the fashion brand have a position in the market to merge their corporate values with sustainable fashion, which could eventually bring

sustainable development in their product and in the supply chain (Joy et al., 2012). But there is a barrier for the fashion industry to implement this trend called Fast fashion that changes frequently. Young generation keeps changing their clothing choice to cope with situation, season, fashion world and so on. As they cannot or do not spend much behind this continuously changing trend, fashion brands need to bring a cheaper collection which is always not sustainable (Joy et al., 2012; Niinimaki, 2010).

Gladwin et al. (1995, p. 42) suggested that to be socially sustainable a firm should be

1) "Internalize social cost

2) Grow and maintain capital stock

3) Not exceeding social carrying capacities

4) Foster democracy

5) Enlarge the range of people's choice

6) Distribute share of property and resources fairly"

In spite of being a well-organized suggestion, the major drawback of the above mentioned definition is companies cannot fulfill the expectations of all stakeholders at a time. Very often firms face trade-offs between the interests of different stakeholders. Kaptein and Wempe (2001) suggested a solution for this dilemma; they suggested the companies to be fair and trustworthy to all stakeholders as they cannot make everyone happy at a time. In other words, a company can be socially sustainable if they maintain integrity, transparency, and fairness in all of their activities.

Reporting social dimensions in sustainability assessment has many forms such as: TBL tools (Daizy et al., 2013), CSR principles from the United Nations Global Compact (EC, 2011), the ISO social responsibility standard, ISO 26000 (ISO, 2014), the GRI sustainability reporting framework (GRI, 2014) and so on. The following are variables compatible with the discussed sector of this study.

2.5.3.1 Labor and Workforce Management

Employees are the main driving force of the business. Good relationships with employees are one of the most important factors for a business to

be successful, especially industries like ready-made garments characterized by organized labor.

Labor management includes, but is not limited to, the freedom of association and the recognition of the right to collective bargaining, the elimination of child labor, the abolition of any form of forced labor and equality in terms of gender and ethnicity (both in recruiting and remuneration). This variable also considers the conformance of the local laws and policies regarding labor affairs.

This variable measures policy to manage labor relations, equal employment and development opportunities, human rights and freedom of organization.

2.5.3.2 Workplace Management

Father of Toyota Manufacturing System, Taiichi Ohno, believed that real development cannot be achieved without focusing or starting the development from Gemba (Ohno, 2013). Gemba literally means actual place, here he emphasized on the workplace.

Safe and healthy working environment is another important measurement of social dimension. It not only means hygienic workplace but also adds fear free, discrimination-free, and fairly treating organization. In workplace management issues like properly built factory building, safe machinery operation, sanitation, drinking water, workplace security and so on are included

2.5.3.3 Community Impact

Although the corporate philanthropic program is not directly related to production, it works as the catalyst for corporate success. Company's philanthropic activities associated with its business size measure the community impact of the business. This variable measures external engagement and community impact through corporate citizenship and corporate philanthropic activities. It also measures those from a cost/benefit perspective.

Community impact, in fact, is the impact on the people in the community, but all the individuals are not equally affected by any facility. As any factory may affect different individual/family differently the word "community" is difficult to define. Hence, community impact mostly measures "public interest" and/or areas identified by the representative (Lichfield, 1996).

2.5.3.4   Stakeholders Engagement

Stakeholders are the people who are directly or indirectly affected by any project, organization and/or sector. Stakeholders engagement is also another important measurement of sustainability as the first group of people affected by the evildoing of any organization are its stakeholders (IFC, 2007).

Stakeholder engagement matters a great deal in the discussed industry, some recent accidents and man-made destructions are proof of that. Through stakeholder engagement, companies can create a positive relationship with the stakeholders (labor unions, regulators and/or local community) which in turn help to reduce unexpected financial and reputational loss (by the incidents such as strikes, sabotage and so on). Furthermore, easily accessible social media helps news to spread faster, both good and bad. People can share news and incidents through different social platform almost without any cost. Hence, constructive relationship with stakeholder may bring a good reputation for the company and praised by the community.

2.6 Research Models and Hypotheses

From the discussion above we ended up in two research models depicted below. Research model 1 is the construction of the proposed sustainability index which is mapped from existing literature and models. Sustainability index of this study also considers both policy and practice sides of each variable (sub-dimension). Therefore, the model is designed to assess from both policy of the sustainability components and actual practice of those items point of view.

Research model 2 shows the interrelationship among the dimension and perspectives of sustainable development. This model serves as the basis of theories to be tested.
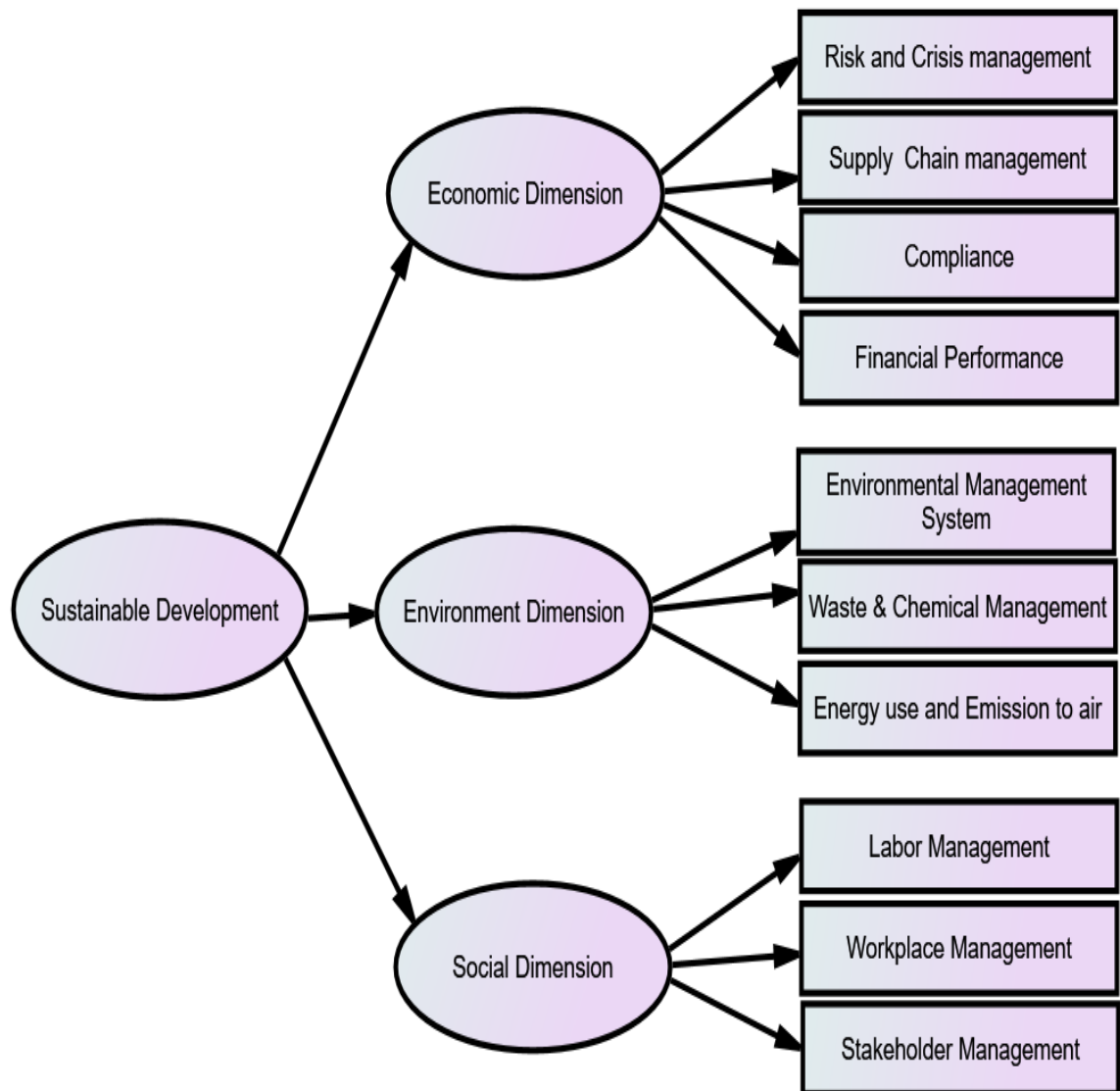
Figure 2.4 Research Model 1
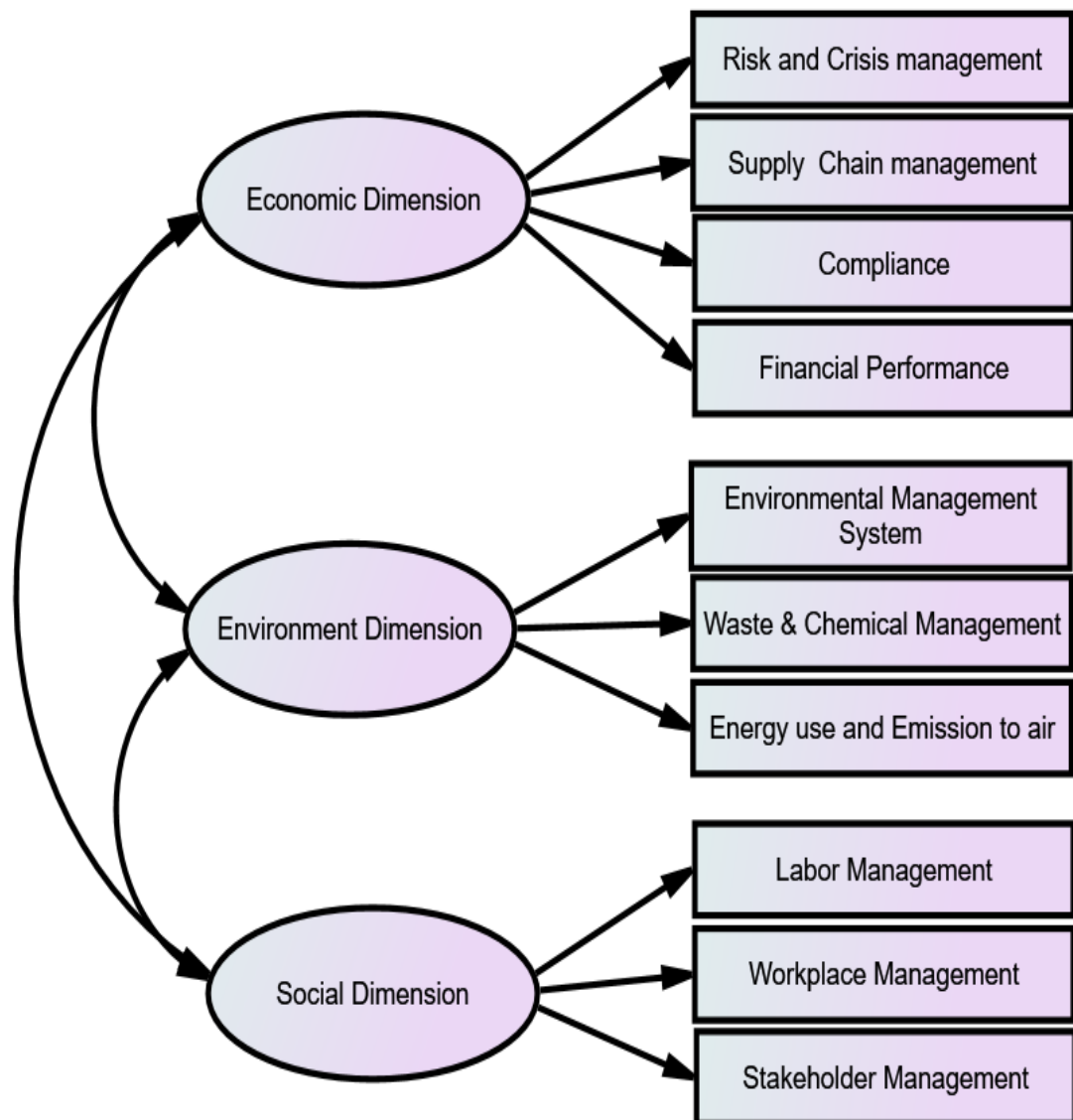
Figure 2.5 Research Model 2

This dissertation further investigates the relationships as hypotheses testing. Besides developing an index, interrelationships of dimensions of sustainability are tested. Hence following hypotheses would be tested to check above-mentioned relationships:

H1: Sustainable Development (SD) Index for ready-made garments sector in Bangladesh consists of three dimensions: economic, social and environmental dimension.

H2: Economic dimension of SD is positively related to the social dimension of SD

H3: Economic dimension of SD is positively related to the environmental dimension of SD

H4: Environmental dimension of SD is positively related to the social dimension of SD.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter addresses the second step of the two-step primary research framework. Through extensive literature review, chapter two provides theoretical index framework along with dimensions and sub-dimensions, this part offers detailed method and steps to measure that index. It discusses research orientation and research design and then explains population and sample, data collection tools and methods and finally data analysis process and tools used to process data.

3.1 Research Design

There are mainly four types of research orientation a researcher can take to direct his/her research such as: explorative, descriptive, explanatory and interpretive. Besides, in some special cases, another type of research conducted called actions research to check change over time (Gray, 2013).

Explorative research is something that explores the discussed industry, sector, community or group to achieve the basic knowledge and understanding of the field. This orientation is mostly used for the fields where none or very few studies found to have a firm knowledge about that.

The descriptive orientation can be called the next step of research; it can be used in the field where basic idea or definition is already established. Descriptive orientation is mostly used to find relationship, role, values impact and so on among the variables without digging deep to find the reason behind that. On the contrary in explanative orientation relationship and impacts are discovered along with the reason behind them. These type researches are conducted to explore why specific phenomena occurred.

And finally, interpretive studies explore peoples experience and their views/ perspectives of that experience. Typically these types of studies are inductive in nature and mostly adopt qualitative data collection methods.

This study has taken explorative and descriptive orientation as the concept of sustainability is a new phenomenon in the RMG sector and quite new for Bangladeshi industry. Purpose of this study is to assess the sustainability of the RMG sector of Bangladesh while doing so indicators need to be defined for this sector and questionnaire need to be developed. Still, there is confusion in the literature of sustainable development about the definition and indicators. Industry and country-specific indicators need to choose carefully which is not done yet. So, the first part of the research provides a detail of sustainable development in the RMG sector of Bangladesh as well as the importance of sustainability focus of that industry. On the other hand, the relationship between the dimensions of sustainability is also tested which falls under the descriptive orientation. Some factors of sustainable development are also country and industry specific. Hence, factors found in the previous literature need to check whether they fit this specific sector or not.

3.2 Population and Sample

As the target sector is Ready-made garments (RMG), RMG factories are the main area of interest of this study. To determine the size of the sample of the study, first population size needs to be defined. Although earlier in this dissertation mentioned that the number of RMG factories in Bangladesh is around 4,500, it is not an absolute figure. Rather, the number of the factories in the discussed field is somewhat ambiguous. Department of Inspection for Factories and Establishment gives a total number of 4809 factories all over the country (DIFE, 2016). But unofficially the number is much higher than that of government's calculation. New York University, Stern Business School has extensive research and fieldwork on this data. Researchers at Stern Business School compile data from all the available sources (DIFE, BGMEA, BKMEA, Alliance, and Accord) and deducted mutually inclusive numbers, which gave them a total of 7,179 RMG factories in Bangladesh (Labowitz, & Baumann-Pauly, 2015). From their study, they made a RMG map for Bangladesh.

But all the above-mentioned factories are not producing for foreign brands, rather a majority of them working as "sub-contractor". This study aimed to collect data from Tier 1 factories, who are the direct exporter of the brands. Stern Business School team using Utilization Declaration list collected from BGMEA figured out that there are around 3,200 direct exporter factories in this sector of Bangladesh who exported about 1.57 billion units of apparel products in 2015 (Labowitz, & Baumann-Pauly, 2015).

Hence, the population of this study is 3,200 direct RMG exporter factories of Bangladesh. To avoid uncertainty, supplier list of few big brands are followed. Data is collected from the two major divisions of the country, Dhaka, and Chittagong; as the majority of the garments factories are located there. Convenient sampling technique will be used as access to some factories is restricted for security reason. The sample size is determined by using Slovin's formula: $n = N / (1 + Ne^2)$, accepting five percent error gives us a sample size of 355 facility/factories.

3.2.1 Data Collection

The objective of this study is to develop an index to assess sustainability in the RMG in Bangladesh. Once the theoretical index is developed, it is needed to be tested. To do so primary data has been collected from the RMG factories of Bangladesh. Questionnaires are distributed both physically and electronically using Survey Monkey. Target respondents are Human Resource Manager, Production Manager, Procurement Manager, Factory Manager and so on of RMG factories.

3.2.2 Pilot Study

A pilot study has been conducted to test validity and reliability of the proposed 62 items sustainability questionnaire. 30 respondents participated in this pilot study. Participants are from human resource and compliance departments of various RMG factories. Their official ranks are ranging from Senior officer to assistant manager. These surveys conducted individually and face to face to observe their reaction to the questionnaire.

3.2.3 Index Development

During this stage, questionnaires have been distributed using different channels including email, online survey (survey monkey), paper copy (hard copy) and so on. The researcher used personal and family influence to reach maximum numbers of respondents. Besides, two international brands provided their supplier lists which are also exploited to collect data. Researcher physically visited many factories to observe the condition and collect data. The questionnaire contains two parts, demographic data on the first part and sustainability questionnaire on the second part. Removing incomplete responses total 238 responses considered for further analysis.

3.3 Measures

As the primary objective of this research is to develop a sustainability index for the RMG sector of Bangladesh, an index structure is built based on Research Model 1. Variables here are chosen from existing sustainability approaches, whereas sector specific variables are chosen carefully along with general variables. Variables are explained in the literature review section. All the variables are assessed for both policy and practice in the RMG sector of Bangladesh. Model 2 of this research explores the relationship between the dimensions sustainable development. This relationship measure explains the consistency of the developed index.

3.3.1 Measurement of Variables

To develop sustainability index variables has to be examined thoroughly. Variables are measured by using a questionnaire which consists questionnaire regarding all the variables and for each and every variable questions include both policy and practice in that field.

The questionnaire is made both in Bengali and English to remove language barrier whereas original questionnaire is in English. As researcher's mother tongue is Bengali, it would be easier to translate into that language. But for the credibility of the translation, back translation of the questionnaire (Bengali to English) is also conducted by a professional translator.

Some of the variables are easy to measure as the questionnaires are already available from above-mentioned sources; for other variables, I need to create own questionnaire. Some of the variables have several measurements. Hence, the measurement related to the context will only be considered.

All the variables measured using a five-point Likert scale ranging from never true to always true. Total numbers of questions are 67 including five general information questions.

3.3.2 Instruments

The main purpose of this study is to develop an index to assess sustainability in the Ready-made garments sector in Bangladesh. Therefore, a new instrument has been developed for all three dimensions and ten sub-dimensions under the three dimensions.

3.3.2.1 Economic Dimension

This dimension measures the economic sustainability of the RMG sector in Bangladesh. This dimension focuses on economic development and sustaining that for a longer period. Economic development does not only measure financial growth or development rather measures areas which have a direct or indirect impact on the economic health of the sector. This dimension includes four sub-dimensions named Risk and crisis management, Supply chain management, Compliance and Financial performance.

1) Risk and crisis management

This scale measures ability to take the risk and handle different types of existing risk and crises in the industry. RCM measurement scale includes six items. Three of the items represent the policy of the organization related to the risk and crises management and other three indicate existing practice there.

2) Supply chain management

The supply chain is very important for smooth operation of such industry. This sub-dimension measures the health of supply chain and proper management measures of the supply chain. SCM scale is consists of six items which also include both policy and practice in the items.

3) Compliance

Compliance measures some criteria which are important to maintain the quality of management. Compliance includes brand COC, health and safety policy, bribery policy and so on. Compliance measurement scale also includes six items including both policy and practice.

4) Financial measurement

Generating profit is the main goal of business organizations. This scale directly measures the financial growth of the organization. This scale also consists of six items which contain the equal number of items from policy and practice.

3.3.2.2 Environmental Dimension

This dimension focuses on the direct and indirect impact of the sector on the environment. Through their day to day activities, factories in this sector damaging environment both intentionally and unintentionally. Some activities include throwing hazardous wastes, emission to air, energy and water consumption and so on. This dimension includes three sub-dimensions, such as Environmental Management System (EMS), Energy use and emission to air and Waste and wastewater management.

1) Environmental management system

Environmental Management System is a well-accepted measure to protect the environment from harmful activities of human, especially industries. In this study, EMS scale measures consciousness and application of this worldwide accepted method in the discussed industry. This scale includes six items; three from policy and three from practice.

2) Energy use and emission to air

This sub-scale measures tracking and effort to minimize the use of energy (electricity and other fossil fuel) and emission to air. This is one way to measure responsibilities of the organization towards the environment.

3) Waste and wastewater management

Throwing solid and liquid waste is one of the most harmful human activities towards the environment. This scale measures waste and wastewater

processing intention and practice before throwing out. Waste and wastewater management sub-scale also contains six items.

3.3.2.3 Social Dimension

The social dimension of sustainable development measures fulfilling the responsibility of the organization towards society. Here "society" includes workforce management, workplace management, and community impacts. Ensuring a healthy workplace and proper treatment of the employees and community people is a major responsibility of industries. This scale measures performance of that responsibility. Social dimension includes three subscales; Labor management, Workplace management, and Stakeholder engagement.

1) Labor management

This sub-scale measures whether proper treatment of the employees exists in the organization or not. It includes paying salary on time, acknowledging and providing other rights of the employees in the workplace. This sub-scale contains six items.

2) Workplace management

Workplace management sub-scale measurement ensures healthy and safe workplace for all. This measure includes hygiene, building construction, dangerous machine operation and so on. This scale also includes three workplace policy items and three workplace practice items.

3) Stakeholder engagement

In this study the word stakeholder indicates different social organization, labor organization, government and non-government organization and community people. Every organization has a responsibility towards society and engaging stakeholders might fulfill their responsibilities towards that. Stakeholder engagement scale includes eight items from both policy and practice.

3.4 Data Analysis

The main objective of this research is to develop an index for RMG sector in Bangladesh and to determine loadings of and the relationship among the dimensions of sustainability. Besides assessing the level of sustainability is another objective of

this study. Analysis processes to pursue above-mentioned objectives are explained below.

3.4.1 Index Development

This is the major part of the study; an index has developed through different stage of the analysis.

3.4.1.1 Item Generation

Items for the proposed index were mostly adopted from two major sources; Sustainable Apparel Coalition (SAC, 2015) and RobecoSAM (2013) some questions are also developed by the author. After a detailed study of literature, industry and country-specific items are chosen for the index. After a rigors study, the index ended up with 62 items which cover all three dimension and ten sub-dimensions of sustainability. A five-point Likert scale is used to develop the index. Face and content validity is tested during this stage by non-RMG professionals. Then the validity and reliability of the questionnaire are tested by a pilot test where 30 RMG professionals took part.

3.4.1.2 Content Validity

To test content validity questionnaire are given to two scholars (committee members of this study) and three senior officials (a team leader-Compliance department, an Assistant Manager-Human Resource department, and a senior officer-Sustainable Development department) of three different RMG factories to check whether they understand the concept of the questionnaire. This process is called Item Objective Congruence (IOC); the purpose of this test is to confirm that the items are congruent to the objective of this study (Turner, & Carlson, 2003). During this process, participant experts score items based on the specific objective of that scale and items should be removed if average score of the item is below 0.75 (Hambleton, 1978).

Experts score the items on the following basis:

The item is congruent with the objectives = +1

The item is uncertain to be congruent with the objectives= 0

The item is not congruent with the objectives= -1

The following table shows the result of IOC; as none of the items score less than 0.75, all retained for further processing.

Table 3.1 Item Objective Congruence: Economic Dimension

Item		Score
	1.1 Risk and Crisis Management	
RCM1	Specific committees /departments /persons are responsible and accountable for enterprise risk management at the facility in terms of risk appetite and tolerance as well as risk monitoring & reporting.	1
RCM2	The facility performs a risk analysis for financial risk, operational risk, market risks, strategic business risks and compliance risks.	1
RCM3	The facility defines all above-mentioned risks clearly for the organization.	1
RCM4	There are strategies of financial incentives to senior executives and line managers in order to promote and enhance an effective risk culture throughout the organization	1
RCM5	This facility measures continuous improvement in risk management practices through involvement of employees in structured feedback process,	1
RCM6	This facility has a proper training program in place throughout the organization on risk management principles,	1
	1.2 Compliance	
Com1	Corporate codes of conduct have been defined at the facility for corruption & bribery and Money-laundering and/or insider trading/dealing	1
Com2	Corporate codes of conduct have been defined at the facility for discrimination, Confidentiality of information and Antitrust/anti-competitive practices	1
Com3	Responsibilities, accountabilities and reporting lines are systemically defined in all divisions	1
Com4	Employee performance appraisal systems integrates compliance/codes of conduct	1
Com5	Disciplinary actions are in place in case of breach of COC, i.e. warning, dismissal, zero tolerance policy	1
Com6	Dedicated help desks, hotlines and/or complaint boxes are in place.	1

Table 3.1 (Continued)

Item		Score
	1.3 Supply Chain Management	
SCM1	The facility defined a formal process to identify critical suppliers (e.g. high volume suppliers, suppliers of critical components, non-substitutable suppliers)	1
SCM2	The facility has a formalized process in place to identify sustainability risks in the supply chain	1
SCM3	The facility has taken measures in order to manage sustainability risks amongst your tier 1 suppliers on Environmental and human rights (ILO convention, e.g. forced or child labor, freedom of association) standards for supplier's processes, products or services	1
SCM4	The facility experienced sustainability initiatives in the supply chain that have delivered clear business benefits (in terms of either cost reduction, risks reduction or revenues growth) and indicate the benefits generated from these initiatives.	0.8
SCM5	All the tier 1 suppliers have been assessed as a part of ongoing monitoring of suppliers process	1
SCM6	The facility undertake a spend analysis of its supply chain	1
	1.4 Financial Performance	
FP1	The facility has a formalized strategy in place to increase total sales volume	1
FP2	The facility has a long-term plan for improving overall financial performance	1
FP3	The facility has proper plan in place to increase market share	1
FP4	The facility experienced significant growth in total revenue during the current year	1
FP5	The facility observed significant growth in Return on Assets (ROA) during the current year.	1
FP6	The facility has demonstrated improvement in overall financial performance	1

Table 3.2 Item Objective Congruence: Environmental Dimension

Items		Score
	2.1 EMS	
EMS1	One or more members of management are specifically responsible for environmental management activities.	1
EMS2	This facility has been in compliance with all legal requirements/permits during the past 12 months	1
EMS3	The facility has a formal environmental management system or program aimed at understanding and continually improving this site's environmental impacts.	1
EMS4	This site's environmental management systems certified and/or audited by an independent third party auditor or an accredited internal auditor	1
EMS5	This facility has an overarching environmental strategy that prioritizes impact reduction areas and sets long-term targets (3-5+ years) to achieve significant environmental performance improvements	1
EMS6	This site has a program or system for monitoring environmental regulations and permits required for operation	1
	2.2 Energy Use and Emission to Air	
Eng1	This site calculates and tracks, at least annually, its energy use and greenhouse gas emissions	1
Eng2	This site sets and reviews at least annually improvement targets for reducing energy use (including fuel use for on-site transportation if applicable)	1
Eng3	This site has had an energy audit conducted in the last three years by a certified professional to identify potential energy and cost savings	1
Eng4	This site has implemented energy conservation or efficiency measures	1
Eng5	This site sets and reviews at least annually improvement targets for reducing emission to air	1
Eng6	This site has demonstrated evidence of reducing energy use and emission to air	0.8

Table 3.2 (Continued)

Item		Score
	2.3 Waste, Wastewater, and Chemical Management	
Wst1	This site monitors the quantity and quality of waste and wastewater produced	1
Wst2	This site segregates hazardous and non-hazardous waste AND provides training to personnel on handling and segregating waste	1
Wst3	This site sets and reviews at least annually improvement targets to reduce the quantity of waste generated	1
Wst4	This facility systematically monitors applicable chemical use regulations on a regular basis to ensure compliance and to identify new or changing compliance requirements	1
Wst5	This facility has a business process to ensure compliance with all Restricted Substance Lists (RSLs) for brands it does business with	1
Wst6	This facility has reduced the use of chemicals by the substitution of biological enzymes in at least one of the processes	1

Table 3.3 Item Objective Congruence: Social Dimension

Item		Score
	3.1 Labor and Workforce Management	
Lbr1	All workers are provided with a legally recognized, written contract or agreement and an employee handbook and training on the contents of that.	1
Lbr2	Workers are paid on time by cash or direct debit on their account for last one year	1
Lbr3	There is a written policy on employee handbook, formal contract paper, food, and transportation facilities and other benefits.	1
Lbr4	Food and Transportation subsidies and/or free food and transportation is provided to the workers	1
Lbr5	There is a written policy on hours of work, days off, overtime hours, grievance procedure, and it applies to all workers in the Facility.	1
Lbr6	The facility is aware of the diverse workforce in the community and actively recruits members from a diverse population.	1
	3.2 Workplace Management	
WP1	The facility provides means and opportunities for workers to increase health awareness and/or develop life skills and provides free, voluntary and confidential medical screening on an ongoing basis.	1
WP2	All machines with a pinching, puncturing or cutting risk have properly functioning safety guards, safety controls and/or emergency stops in place and all employees are trained on PPE and safety procedures	0.8
WP3	The Facility has a building construction authentic certification certificate from the agency responsible for authorizing construction in that country with the number of floors authorized in the certificate matching the number of floors that exist in the building today. Furthermore, electrical wiring throughout the Facility is in full compliance with local regulations	1
WP4	The facility has clearly written a policy on health awareness program, risky machine operation training and fire drill.	1

Table 3.3 (Continued)

Item		Score
WP5	The facility has a policy of inspecting building construction, shelves inside and outside the wall, electric wiring, fire exits and assembly point.	1
WP6	At least 2 unlocked exits exist in each production and dormitory area/floor.	1

3.3 Stakeholder Engagement and Community Impact

Stak1	The facility has a policy of engaging with local, regional and international stakeholders to improve working condition and to address issues of concern.	1
Stak2	Facility participates in multi-stakeholder or industry forums to develop a full understanding of the risks and challenges in the value chain	1
Stak3	Facility engages with key local /regional/international stakeholders to improve working conditions in the value chain.	1
Stak4	Facility engages (either directly or via industrial trade association or tripartite initiatives) with local & district level Trade Unions to proactively address issues of concern to the industry.	1
Stak5	The facility has sponsored (paid for and/or organized) a community service event within the last 12 months.	1
Stak6	The facility makes regular donations to charitable (non-profit/non-governmental) organizations or projects.	1
Stak7	The facility has implemented innovative community projects that improve the social well-being of workers and their families.	1
Stak8	The facility has a policy of community services which include regular charity, development of employee and their family members and local community members' lives.	1

3.4.1.3   Pilot Study

A pilot study has been conducted to confirm face validity and reliability of the proposed scale. Total 30 interviews have been taken on the proposed questionnaire. The interviews took individually to observe the time of completion, verbal and non-verbal reaction, and comfort or discomfort with the questionnaire. All the respondents chose English version of the questionnaire without any exception. The pilot test indicates that the questionnaire is valid and reliable for further testing. Detail result of the pilot test is discussed in chapter four.

3.4.1.4   Item Analysis

In this stage, item discrimination has been tested by independent t-test. Using cut off points (33% and 66%) difference between the values of high and low groups have been checked. Items having t-value>2 and $p \leq 0.05$ are only retained for further analysis. Then item-total correlation is also considered. Items with item total correlation value less than 0.3 or more than 0.8 indicates that it is inconsistent with the average sets of items. Values less than 0.3 indicates very poor correlation and values more than 0.8 indicate too well correlation and both of them should be removed (Field, 2005).

3.4.1.5   Exploratory Factor Analysis

After conducting item analysis EFA has conducted to check factor loading. In this study, EFA has used mainly for screening out the items that do not show bond strong enough with the factors. Eigenvalue EFA model used to test factor loading as eigenvalue characterizes the information within a factor (DeVellis, 2003). Standard eigenvalue set at one as Kaiser (1960) suggested. A principal component analysis has been chosen by using Quartimax rotation. According to Field (2009, p.644) "Quartimax rotation attempts to maximize the spread of factor loadings for a variable across all factors." This rotation method used as it could be helpful for further analysis.

Items showing loading value below 0.4 and cross loading value more than 0.4 are removed from the items list (Thomson, 2004).

3.4.1.6 Confirmatory Factor Analysis

Items retained from EFA are used for CFA; this test confirms the loadings of the items on factors. At this stage, three dimensions of sustainability are used as factors. CFA begins with 40 items and ended up in a model with only 18 items. The remained 18 items provided model fit and standard loading. Following standards are maintained during CFA

Table 3.4 Goodness of Fit Criteria

Indices	Model fit value	Reference
CMN/df	<5	Bollen (1989)
RMR	<0.08	Hu and Bentler (1999)
RMSEA	<0.08	Browne and Cudeck (1992)
CFI	≥0.9	Bentler (1990)
TLI	≥0.9	Bentler and Bonett (1980)
GFI	≥0.9	Tanaka and Huba (1985)
AGFI	≥0.9	Tanaka and Huba (1985)
NFI	≥0.9	Bollen (1989)
IFI	≥0.9	Henry and Stone (1994)
PNFI	>0.6	Schumacker and Lomax (2004)

Factor loading value is also considered, items with the loading value below 0.4 are removed from the index.

3.4.1.7 Correlation Analysis

Besides index development correlations between sustainability dimensions are also tested following research model 2. A separate model, using the developed 30-item sustainability index, is created in Amos to test the correlation. This analysis shows that dimensions are positively correlated to each other.

3.4.1.8   Reliability and Validity of Developed Scale

Reliability of the developed scale is also tested using Cronbach's alpha. Cronbach's alpha value greater than 0.5 is considered acceptable; more than 0.7 is considered adequate; more than 0.8 is marked as good and greater than 0.9 is called excellent (Bentler, & Chou, 1987). The result of this stage shows that our developed index is reliable.

3.4.2   Assessing Sustainability

As assessing the level of sustainability in the ready-made garments industry of Bangladesh is the second objective of this study, a modified version of a simple tool named the Sustainability Barometer ((Prescott-Allen, 2001) is used to understand the level of sustainability of that sector. Although the author used this tool to assess national sustainability in a number of countries using two dimensions, social and environmental, the tool has been modified here to be compatible to check sustainability using all three dimension of this research.
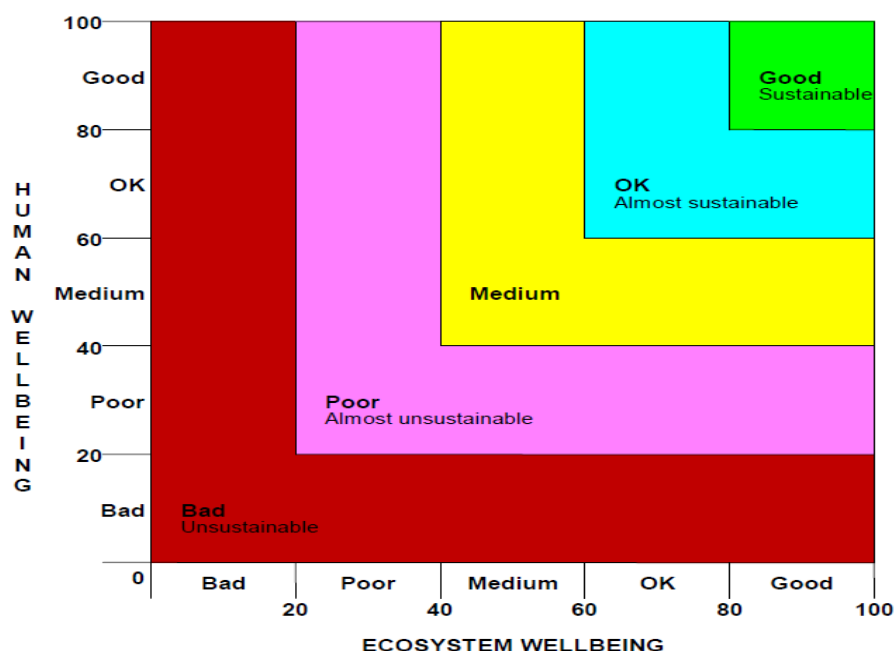
Figure 3.1 Prescott-Allen (2001)'s Barometer of Sustainability

Above mentioned sustainability assessment tool has been modified to fit the purpose of this study. The modified version of this tool has two graphs instead of one; one containing social and economic dimension and the other has socio-economic measure along the X axis and environmental dimension along the Y axis.

Each of the graphs has two dimensions along two axes; it helps to measure two dimensions separately instead of calculating merely a mean value. The dimension with the lowest value overrides the others which imply that none of the dimensions are less important for measuring sustainable development in the ready-made garments sector. Furthermore, different colors band scale gives a clear idea of the condition of sustainability of the sector.

Standards are adopted unchanged, i.e., below 20 percent bad, 21- 40 percent poor, 41-60 percent medium, 61-80 percent OK and above 80 percent good. Same standards are followed for both the graphs and lowest standard of the two axes would be considered. Purpose of considering lowest one is to emphasize development in all three areas simultaneously.

Table 3.5 Color Bands of the Assessment Scale

Percent	Color	Title	Explanation	Origin
0-20%	Red	Bad	Performance is unacceptable	
21-40%	Purple	Poor	Performance is poor or undesirable	
41-60%	Yellow	Medium	Neutral Performance	Prescott-
61-80%	Blue	Fair	Performance is acceptable. But still below the desirable level.	Allen, 2001, pp.09
81-100%	Green	Good	Performance is desirable. Objectives of sustainability are fully met.	
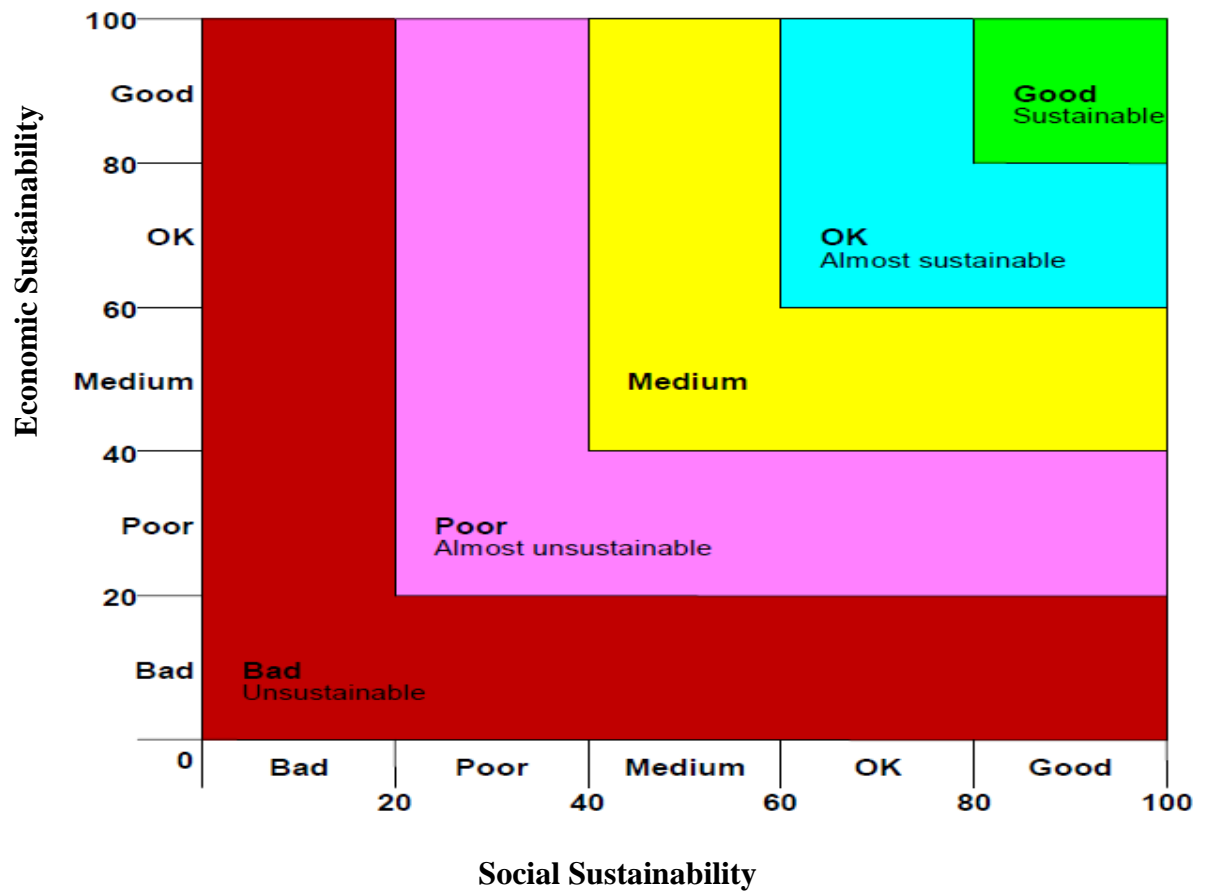
Figure 3.2 Modified Version of Barometer of Sustainability 1
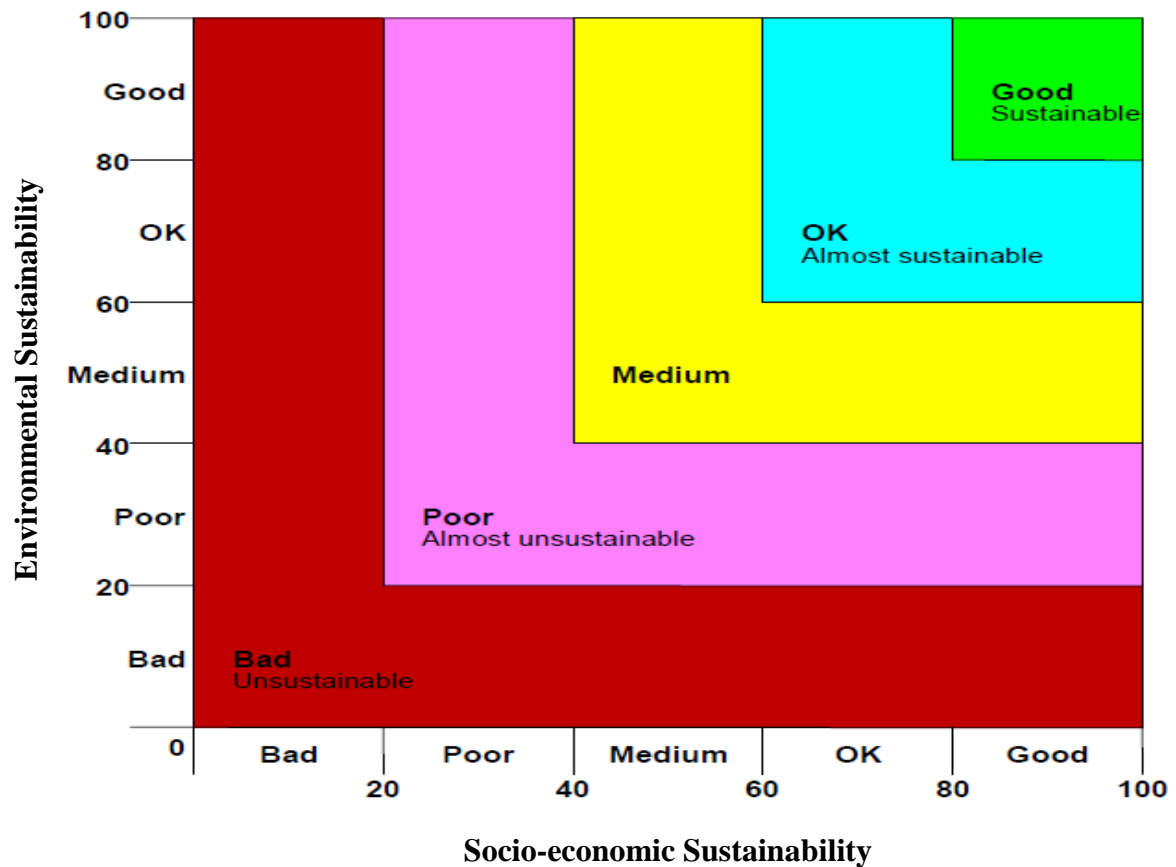
Figure 3.3 Modified Version of Barometer of Sustainability 2

3.5 Pilot Study

A pilot study has been conducted to test the face validity and reliability of the questionnaire. As the purpose of this research is to develop an index for sustainability in the RMG sector of Bangladesh, proposed questionnaire need to be checked before data collection process begins.

Participants of this pilot study are senior officers and assistant managers of human resource and compliance department of various RMG factories in Bangladesh. Responses have been taken individually and their reactions have been observed. Both Bengali and English questionnaires have been provided, but respondents chose to answer on the English one without any exception. Total 30 completed questionnaires are considered for this pilot study.

Respondents' completion time varies, ranging from 25 minutes to 40 minutes; average 32 minutes. Respondents' age varies from 28 to 35 years and mainly male (only 5 out of 30 are female).

Reliability

To test the reliability of the questionnaire items, a statistical test conducted on the collected responses during pilot testing. Cronbach's alpha (Cronbach, 1951) test has been conducted as it is considered one of the most used reliability testing technique. Cronbach's alpha values of 0.90 or more are considered excellent, 0.80 is considered good and 0.70 is considered as adequate and values below 0.5 are considered as unreliable and hence, should be avoided (Bentler, & Chou 1987).

The Cronbach's alpha values of the dimensions of this pilot testing are as follows: Economic dimension 0.875, Social dimension 0.943 and Environmental dimension 0.870.

Table 3.6 Reliability Measure for Sustainability Dimensions

Dimension	N of Items	Cronbach's Alpha
Economic	24	0.875
Social	20	0.943
Environmental	18	0.870

3.6 Demographic Profiles

As pilot test provides adequate reliability and validity of the questionnaire, further data collection and analysis performed. Total of 238 completed questionnaires found from different types RMG factories of major cities in Bangladesh. Although the questionnaire includes five demographic questions, the majority of the respondents were reluctant to answer two of them (location of the factory and position of the respondent). Following two tables provide demographic characteristics of the respondents and the factories.

Table 3.7 Demographic Characteristics of Respondents

Variable		Frequency	Percent
Age	20-30	28	11.8
	31-40	117	49.2
	More than 40	93	39.1

Table 3.8 Demographic Characteristics of Factories

Variable		Frequency	Percent
Product Type	Knit	56	23.5
	Woven	87	36.6
	Knit and Woven	79	33.2
	Others	16	6.7
Number of	Below 1000	20	8.4
Employees	1000-3000	64	26.9
	3000-5000	83	34.9
	More than 5000	71	29.8

CHAPTER 4

DATA ANALYSIS AND RESEARCH RESULT

This chapter presents empirical findings from data analysis process. All the results found in different stages of data analysis would be provided here for further discussion. The main purpose of this paper is to develop an index for ready-made garments sector in Bangladesh. During this process hypothesized items of the index are tested through the different statistical process. This process started with 62 sustainability items, generation of these items are explained in chapter two and three. First, the items went through a content validity stage (IOC), later a pilot test has been conducted to test face validity and reliability of the proposed questionnaire, which has also been explained in chapter three.

4.1 Index Development

This section provides the result of the analysis processes for index development. This analysis process includes three separate statistical steps. It starts with item analysis; remaining items of this step then go through exploratory factor analysis. Finally, confirmatory factor analysis confirms the items of the index with model fit analysis.

4.1.1 Item Analysis

For item analysis, item-total correlation and independent t-test are performed along with Cronbach's alpha. Purpose of conducting these tests is to determine whether any item in the developed scale is inconsistent with the average value of the set of items. To conduct t-test variables are split into three categories where each category contains 33% of the weight and then the middle category is discarded. This method of splitting data is developed by following 27% rule of psychology and more

accurate than median split (Gelman, & Park, 2009). Any value below 0.3 or above 0.8 suggests that the items are either do not correlate properly or correlate too well to accept (Field, 2005). Hence, items showing item-total correlations scores ranging from 0.3 to 0.8 are only considered for further analysis and others are removed. Similarly, items having t-value>2 and p≤0.05 are only retained.

After this process, 50 items left for further analysis. Reliability of the items measured once again after this process using Cronbach's alpha. At this level, Cronbach's alpha found satisfactory for all dimensions (0.81≤ α ≥0.90) and sub-dimensions (0.57 ≤ α ≥ 0.84).

Table 4.1 Item Discrimination: Economic Dimension

	Items	Item Correlation	*t* value Absolute	Sig.	Decision
Risk and Crisis Management	RCM1	.749	6.530	.000	✓
	RCM2	.698	10.015	.000	✓
	RCM3	.740	8.468	.000	✓
	RCM4	.351	0.646	.519	Remove
	RCM5	.525	2.820	.006	✓
	RCM6	.634	3.399	.001	✓
Compliance	Com1	.367	7.369	.000	✓
	Com2	.114	1.545	.125	Remove
	Com3	.347	3.596	.000	✓
	Com4	.279	1.545	.125	Remove
	Com5	.064	0.653	.515	Remove
	Com6	.433	6.989	.000	✓
Supply Chain Management	SCM1	.019	1.512	.133	Remove
	SCM2	.377	7.923	.000	✓
	SCM3	.420	5.878	.000	✓
	SCM4	.332	2.788	.006	✓
	SCM5	.351	2.922	.004	✓
	SCM6	.042	1.648	.101	Remove
Financial Performance	FP1	.225	2.949	.004	Remove
	FP2	.261	2.580	.011	Remove
	FP3	.210	2.125	.035	Remove
	FP4	.344	2.985	.003	✓
	FP5	.300	5.404	.000	✓
	FP6	.332	4.848	.000	✓

Table 4.2 Item Discrimination: Environmental Dimension

	Items	Item Correlation	*t* value Absolute	Sig.	Decision
Environment	EMS1	.587	11.688	.000	✓
Management	EMS2	.494	8.632	.000	✓
System	EMS3	.359	4.133	.000	✓
	EMS4	.461	5.975	.000	✓
	EMS5	.308	4.100	.000	✓
	EMS6	.366	4.416	.000	✓
Energy Use and	Eng1	.525	6.860	.000	✓
Emission to Air	Eng2	.564	9.100	.000	✓
	Eng3	.316	5.519	.000	✓
	Eng4	.360	7.175	.000	✓
	Eng5	.198	1.006	.316	Remove
	Eng6	.306	6.327	.000	✓
Waste,	Wst1	.389	4.918	.000	✓
WasteWater and	Wst2	.432	6.447	.000	✓
Chemical	Wst3	.480	8.102	.000	✓
Management	Wst4	.305	3.234	.001	✓
	Wst5	.545	9.299	.000	✓
	Wst6	.403	7.600	.000	✓

Table 4.3 Item Discrimination: Social Dimension

	Items	Item Correlation	*t* value Absolute	Sig.	Decision
Labor	Lbr1	.627	5.582	.000	✔
Management	Lbr2	.039	.304	.761	Remove
	Lbr3	.714	8.196	.000	✔
	Lbr4	.127	4.744	.000	Remove
	Lbr5	.642	7.646	.000	✔
	Lbr6	.354	6.350	.000	✔
Workplace	WP1	.328	6.618	.000	✔
Management	WP2	.578	12.723	.000	✔
	WP3	.373	9.379	.000	✔
	WP4	.320	5.217	.000	✔
	WP5	.488	9.683	.000	✔
	WP6	.406	8.878	.000	✔
Stakeholder	Stak1	.470	3.126	.002	✔
Engagement and	Stak2	.465	3.418	.001	✔
Community	Stak3	.413	3.617	.000	✔
Impact	Stak4	.528	10.289	.000	✔
	Stak5	.600	10.089	.000	✔
	Stak6	.467	8.009	.000	✔
	Stak7	.318	3.541	.001	✔
	Stak8	.547	8.071	.000	✔

Table 4.4 Reliability Measures of Dimensions and Sub-Dimensions

Dimension	No. of Item	α	Sub-dimension	No. of Item	α
Economic Dimension	15	0.90	Risk & Crisis Management	5	0.865
			Compliance	3	0.62
			Supply Chain Management	4	0.60
			Financial Performance	3	0.67
Environmental Dimension	17	0.82	EMS	6	0.70
			Energy Use	5	0.66
			Waste Mgt.	6	0.69
Social Dimension	18	0.85	Labor Mgt.	4	0.80
			Workplace Mgt.	6	0.68
			Stakeholder	8	0.775

4.1.2 Exploratory Factor Analysis:

EFA has been conducted to test the loading pattern of items on the developed sustainability index. Items retained from the item-total correlation step are used for this step. Three separate factor analyses conducted for three dimensions of sustainable development. Principal Component Analysis is chosen utilizing Quartimax rotation method, eigenvalue more than one has been used for extraction method. The Kaiser–Meyer–Olkin (KMO) measure should be checked beforehand. KMO value above 0.5 is acceptable as it measures the adequacy of the sample size. KMO measures for the dimensions are Economic = 0.894, Social= 0.833, and Environmental= 0.803; all of them are well above 0.5 and considered as "great" (Field, 2009).

Appendix C provides the detailed result of EFA. Items loading more than 0.5 are considered for further analysis. Any items providing value less than 0.5 and cross loading value more than 0.5 are removed from the developed index (Stevens, 2002;

Field, 2009) and others are retained. No item is deleted after conducting EFA. All the items retained from the previous step are forwarded for next step.

4.1.3 Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) has been conducted to examine how well the data fit into the model consists of three dimensions and ten sub-dimensions derived from the theoretical foundation.

To conduct CFA average value of items under sub-dimensions are considered using retained items from the previous step; sub-dimensions are used as latent variables on the second order CFA model. CFA conducted on the 50 items derived from previous steps; the analysis provides following readings: CMIN/df = 5.868; RMR = 0.048; RMSEA = 0.143; CFI = 0.865; TLI = 0.822. It does not provide a proper model fit as standards do not meet.

To examine which items are not consistent with sub-dimensions and dimensions, three separate second order CFA has been conducted for three dimensions by considering items under sub-dimensions as the latent variable. Loading value of the items and model fit are observed to remove the inconsistent items. The result of this process is added on the Appendix D. After this process, 20 items are removed as they show very weak relation with the dimensions. Removed items are Economic Dimension: RCM 1, 2, 3, SCM 5; Environmental Dimension: EMS 3, 5, 6, Energy 3,6, Waste 3, 5, 6; Social Dimension: Labor 6, Workplace 3, 5, 6 and Stakeholder 4, 5, 6, 8.

After all these analyses only 30 items remained and provided following result (table 4.5). All the fit indices show model fit. The mean value of the items of each sub-dimension is considered and sub-dimensions are treated as latent variables.

Table 4.5 Results of CFA for 30-Item RMG Sustainability Scale

CMN/df	RMR	RMSEA	CFI	TLI	GFI	AGFI	NFI	IFI	PNFI
2.170	0.024	.070	0.967	0.953	0.947	0.908	0.941	0.967	0.669

Factor loadings of variables are also considered. Items showing factor loading more than 0.4 are only retained for the sustainability index. Items having loading value less than 0.4 are removed as they show "weak loading" (Deng, 2010).

Table 4.6 Factor Loadings of CFA for 30 Items Sustainability Index

Dimension	Loading	Sub-dimension	Loading
Economic Dimension	0.996	Risk and Crisis Management	0.670
		Compliance	0.760
		Supply Chain Management	0.683
		Financial Performance	0.715
Environmental Dimension	0.825	Environment Management System	0.857
		Energy Use and Emission to Air	0.526
		Waste and Wastewater Management	0.723
Social Dimension	0.710	Labor Management	0.893
		Workplace Management	0.702
		Stakeholder Engagement	0.911

Table 4.6 provides loading measure of sub-dimensions on the model. Loading values of latent variables range from 0.526 to 0.911, which is a measure strong loading on the index.
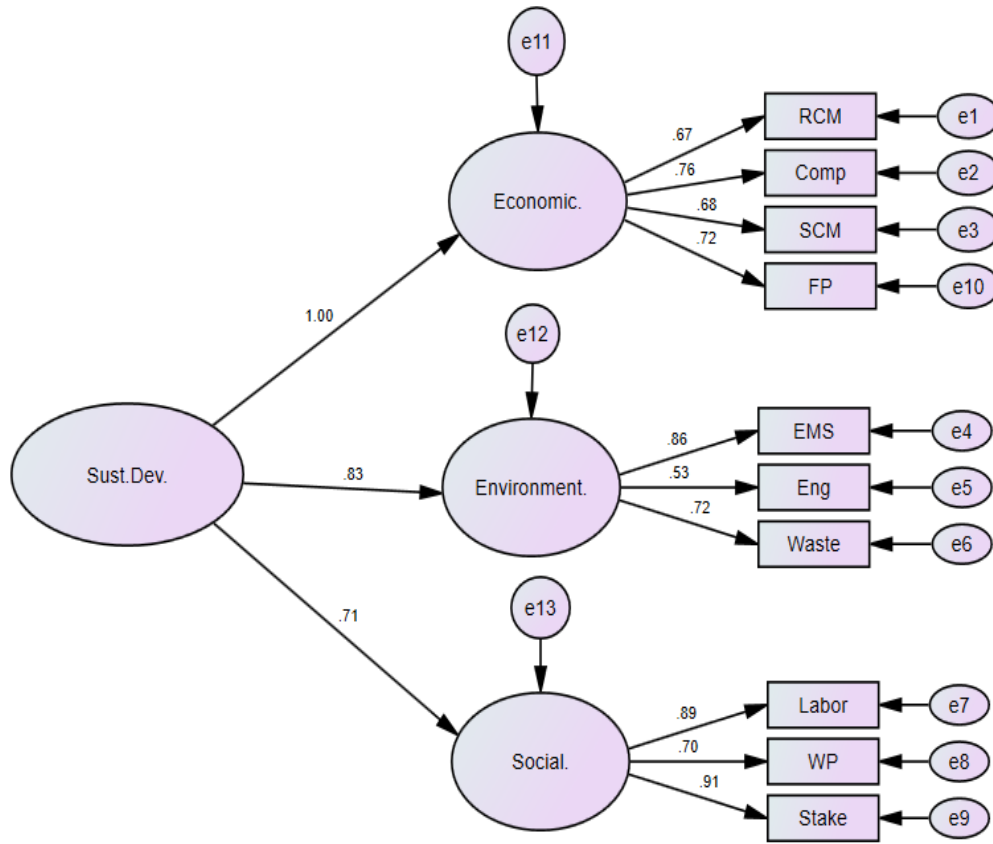
Figure 4.1 Ready-Made Garments Sustainability Index

Figure 4.1 further clarifies the loadings of the dimensions and sub-dimensions on the model. All three dimensions are also found to be very well loaded on the sustainability scale.

4.1.4 Reliability of Developed Scale

An attempt has been taken to confirm the reliability of the developed index. The result of that process is presented here in table 4.9.

Cronbach's alpha values of 0.90 or more are considered excellent, 0.80 is considered good and 0.70 is considered as adequate and values below 0.5 are considered as unreliable and hence, should be avoided (Bentler, & Chou 1987).

Table 4.7 Reliability Measure of Developed Index

Overall Index	No. of Items	Cronbach's α	Dimension	No. of Items	Cronbach's α
Sustainable Development	30	0.927	Economic Dimension	11	0.826
			Social Dimension	09	0.837
			Environmental Dimension	10	0.910

As confirmatory factor analysis confirms the 30-item model, this study considers only the model fit items to be included in the sustainability index for ready-made garments industry. Table 4.8 provides detail of the items included in the index.

Table 4.8 Finalised Version of RMG Sustainability Index

Dimension	Sub-dimension	Item Code	Item
Economic Dimension	Risk and Crisis Management	RCM1	This facility measures continuous improvement in risk management practices through the involvement of employees in a structured feedback process.
		RCM2	This facility has a proper training program in place throughout the organization on risk management principles.
	Compliance	Com1	Corporate codes of conduct have been defined at the facility for corruption & bribery and Money-laundering and/or insider trading/dealing
		Com2	Responsibilities, accountabilities and reporting lines are systemically defined in all divisions
		Com3	Dedicated help desks, hotlines and/or complaint boxes are in place.
	Supply chain Management	SCM1	The facility has a formalized process in place to identify sustainability risks in the supply chain
		SCM2	The facility has taken measures in order to manage sustainability risks amongst your tier 1 suppliers on Environmental and human rights (ILO convention, e.g. forced or child labor, freedom of association) standards for supplier's processes, products or services
		SCM3	The facility has taken measures in order to manage sustainability risks amongst your tier 1 suppliers on Environmental and human rights (ILO convention, e.g. forced or child labor, freedom of association) standards for supplier's processes, products or services

Table 4.8 (Continued)

Dimension	Sub-dimension	Item Code	Item
	Financial Performance	FP1	The facility experienced significant growth in total revenue during the current year
		FP2	The facility observed significant growth in Return on Assets (ROA) during the current year.
		FP3	The facility has demonstrated improvement in overall financial performance
Environmental Dimension	Environment Management System	EMS1	One or more members of management are specifically responsible for environmental management activities.
		EMS2	This facility has been in compliance with all legal requirements/permits during the past 12 months
		EMS3	This site's environmental management systems certified and/or audited by an independent third party auditor or an accredited internal auditor
	Energy Use and Emission to air	Eng1	This site calculates and tracks, at least annually, its energy use and greenhouse gas emissions
		Eng2	This site sets and reviews at least annually improvement targets for reducing energy use (including fuel use for on-site transportation if applicable)
		Eng3	This site has implemented energy conservation or efficiency measures
	Waste and Wastewater	Wst1	This site monitors the quantity and quality of waste and wastewater produced
		Wst2	This site segregates hazardous and non-hazardous waste and provides training to personnel

Table 4.8 (Continued)

Dimension	Sub-dimension	Item Code	Item
	Management		on handling and segregating waste
		Wst3	This facility systematically monitors applicable chemical use regulations on a regular basis to ensure compliance and to identify new or changing compliance requirements
Social Dimension	Labor Management	Lbr1	All workers are provided with a legally recognized, written contract or agreement and an employee handbook and training on the contents of that.
		Lbr2	There is a written policy on employee handbook, formal contract paper, food, and transportation facilities and other benefits.
		Lbr3	There is a written policy on hours of work, days off, overtime hours, grievance procedure, and it applies to all workers in the Facility.
	Workplace Management	WP1	The facility provides means and opportunities for workers to increase health awareness and/or develop life skills and provides free, voluntary and confidential medical screening on an ongoing basis.
		WP2	All machines with a pinching, puncturing or cutting risk have properly functioning safety guards, safety controls and/or emergency stops in place and all employees are trained on PPE and safety procedures

Table 4.8 (Continued)

Dimension	Sub-dimension	Item Code	Item
		WP3	The facility has clearly written a policy on health awareness program, risky machine operation training and fire drill.
	Stakeholder Engagement	Stak1	The facility has a policy of engaging with local, regional and international stakeholders to improve working condition and to address issues of concern.
		Stak2	Facility participates in multi-stakeholder or industry forums to develop a full understanding of the risks and challenges in the value chain
		Stak3	Facility engages with key local /regional/international stakeholders to improve working conditions in the value chain.
		Stak4	The facility has implemented innovative community projects that improve the social well-being of workers and their families.

4.1.5 Correlation Analysis

Correlations among dimensions of sustainable development are measured using the similar model in Amos (figure 4.2).

Table 4.9 shows the details of the relationship among dimensions of sustainable development. All the dimensions found to be positively related to each other ranging from 0.592 to 0.803 at 0.01 level of significance.
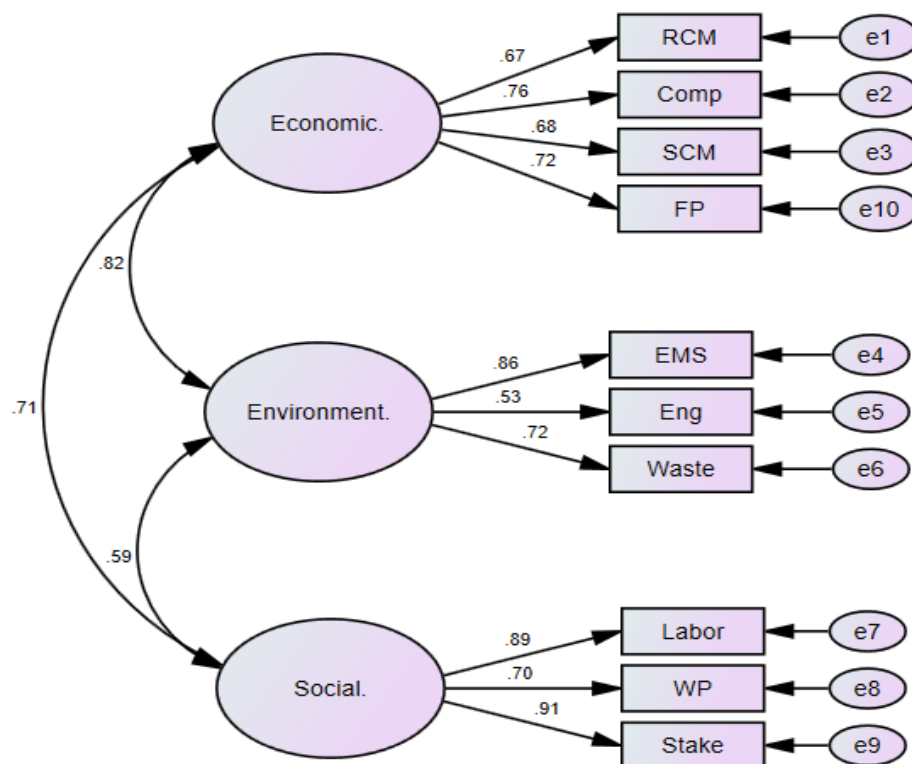
Figure 4.2 Correlation between Dimensions

Table 4.8 Correlations among Three Dimensions of RMG Sustainability Index

	Econ	Env	Social
Econ	1		
Env	.822**	1	
Social	.707**	.586**	1

Note: ** = Correlation is significant at the 0.01 level (2-tailed)

Econ = Economic Dimension

Env = Environmental Dimension

Social = Social Dimension

4.1.6 Hypotheses Testing

This section provides a summary of statistical findings to evaluate hypotheses developed in the previous chapter. Followings are the hypotheses:

Hypothesis 1: Sustainable Development (SD) Index for RMG sector of Bangladesh consists of three dimensions: Economic, Environmental and Social dimension.

Hypothesis 2: Economic dimension of SD is positively related to the social dimension of SD

Hypothesis 3: Economic dimension of SD is positively related to the environmental dimension of SD

Hypothesis 4: Environmental dimension of SD is positively related to the social dimension of SD

Hypothesis 1 has been tested through different steps of scale development. Items have been generated and then passed through item analysis, exploratory factor analysis, and confirmatory factor analysis. At the end of the process finalized version of Sustainability Index for RMG sector in Bangladesh found to have 30 items under three dimensions and ten sub-dimensions. Hypothesized three-dimensional index prevailed after analysis. Dimensions are Economic dimension (Risk and Crisis Management - 2 items, Compliance - 3 items, Supply Chain Management – 3 items and Financial Performance – 3 items), Environmental dimension (Environmental

Management System – 3 items, Waste and Waste Water Management – 3 items and Energy use and Emission to air – 3 items) and Social dimensions (Labor Management – 3 items, Workplace Management – 3 items and Stakeholder Engagement – 4 items). Loadings of sub-dimensions on individual dimension are presented in table 4.6 and loadings of the dimensions in overall sustainability scale are presented in Table 4.10

Table 4.9 Loadings of Dimensions on Sustainability Index

Dimension	Loading	Sig.
Economic Dimension	0.996	0.000
Environmental Dimension	0.825	0.000
Social Dimension	0.710	0.000

Rests of the hypotheses (3, 4 and 5) have been tested by correlation analysis in SEM. All the hypotheses found to be supported as all three dimensions showed significant positive correlation.

Following table provides key points of hypotheses testing.

Table 4.10 Summary of Hypotheses Testing

Hypothesis	Method	Result	Decision
H1: Sustainable Development (SD) Index for ready-made garments sector in Bangladesh consists of three dimensions: economic, social and environmental dimension.	**CFA**	CMin/df= 2.170 RMR= 0.024 RMSEA= 0.070 CFI= 0.967 PNFI= 0.669	Supported
	Cronbach Alpha	Entire Index=0.927 Dimensions= 0.826-0.910	Supported
H2: Economic dimension of SD is positively related to the social dimension of SD	**Correlation**	r=0.71, p<0.001	Supported
H3: Economic dimension of SD is positively related to the environmental dimension of SD	**Correlation**	r=0.82, p<0.001	Supported
H4: Environmental dimension of SD is positively related to the social dimension of SD	**Correlation**	r=0.59, p<0.001	Supported

4.2 Sustainability Assessment

Level of sustainability of the ready-made garments industry of Bangladesh is assessed by using a modified version of a Sustainability Barometer (Prescott-Allen, 2001) and the index developed in the last section. Although the author used this tool to assess national sustainability in a number of countries using two dimensions, human and ecosystem well-being, the tool has been modified here to be compatible to check sustainability using all three dimension of this research, i.e., social, environmental and economic dimensions.

The modified version of this tool has two graphs instead of one; one containing social and economic dimension and the other has socio-economic measure along the X axis and environmental dimension along the Y axis. The lowest performance among the dimensions would be considered as the achieved level of sustainability. Purpose of considering lowest one is to emphasize on development in all three areas simultaneously.

Overall assessment of sustainability has been conducted considering mean of each dimension following the indexed item from the previous section. To maintain the continuity of the adopted scale, assessment results are shown in a circle which resembles an egg. The yolk of the egg represents the economic sustainability and white substance supporting yolk is represented social sustainability. On the second graph, socio-economic sustainability placed on the yolk and environment is surrounding that just as nature. The result shows that assessed sustainability is at the "acceptable" level for all three dimensions.

Table 4.11 Overall Sustainability Measure

Economic Average	Social Average	Environmental Average
78.11	80.35	78.41
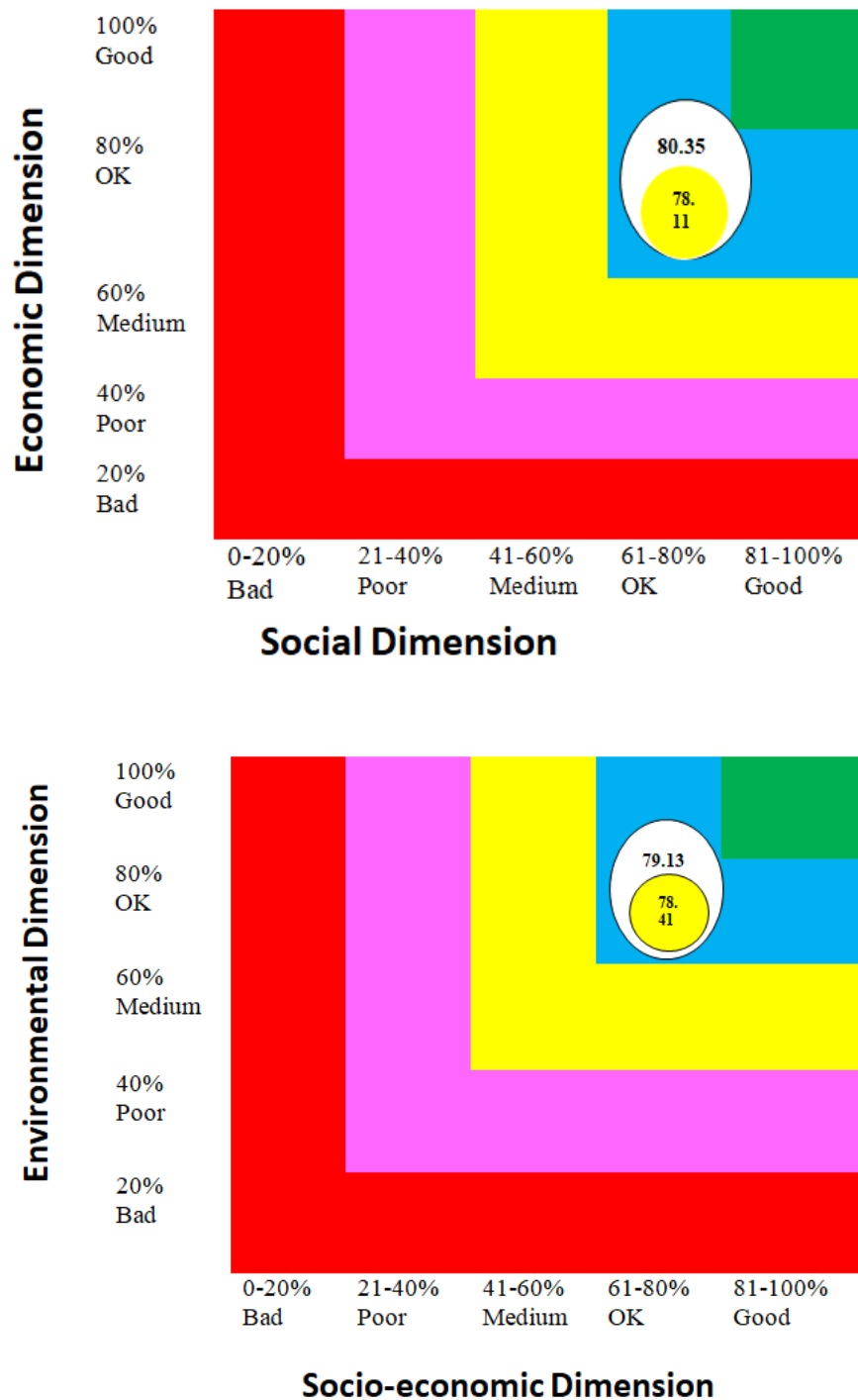
Figure 4.3 Overall Level of Sustainability

Collected data are classified into four categories based on their product types: knitting, woven, knitting and woven and others. First three types do not show much

variation in their sustainability result and aligned with overall sustainability at the acceptable level. However, the category named "others" jump to the next level of sustainability called "desired" or "good". This "others" category includes products like linen, sweaters, terry towels and so on (Ahmed, 2014).

Table 4.12 Assessment of Sustainability Based on Product Type

	Economic Average	Social Average	Environmental Average
Knit	78.54	81.21	78.18
Woven	78.12	79.42	78.62
Knit and Woven	76.87	79.87	77.52
Others	82.66	84.90	82.50
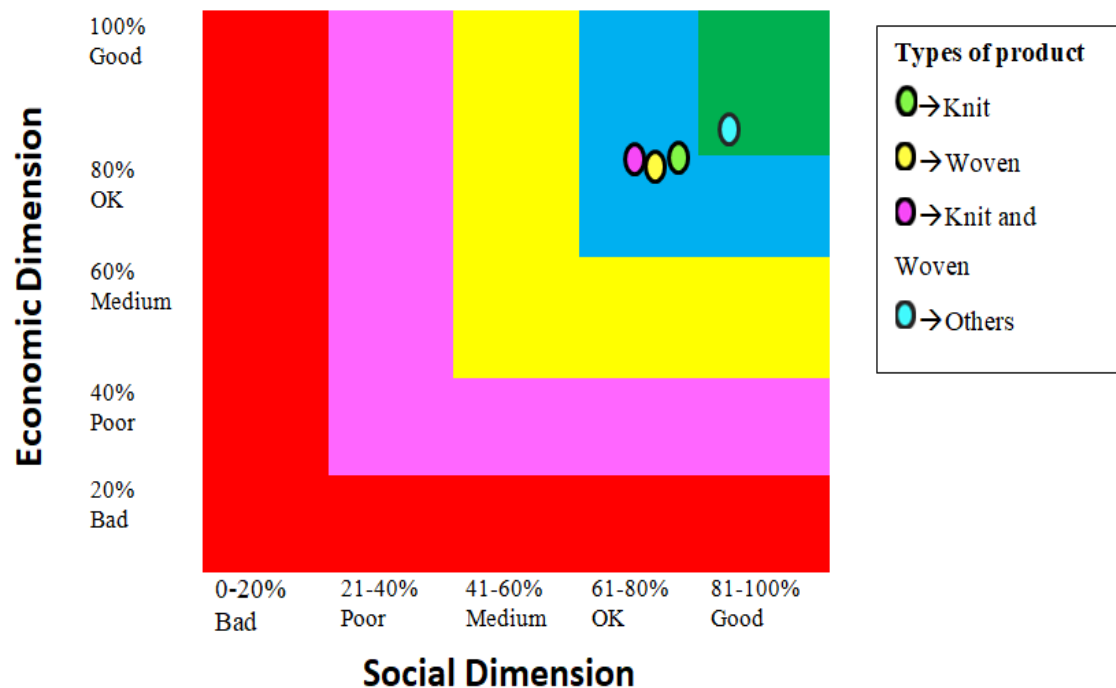
Figure 4.4 Sustainability Measure Based on Types of Product 1
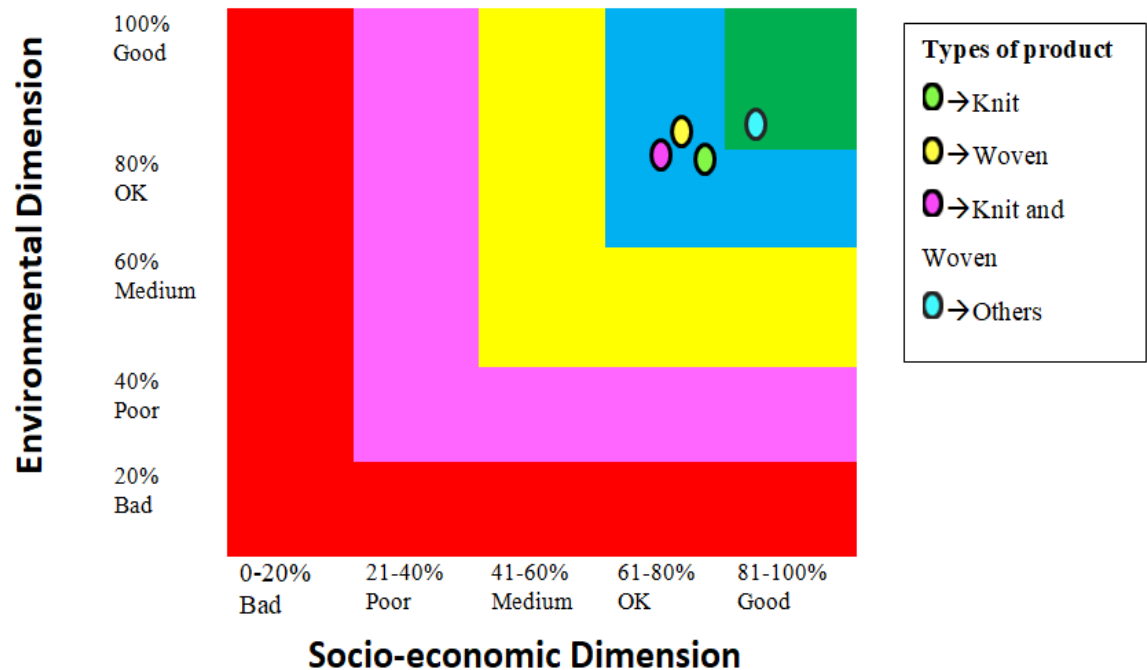
Figure 4.5 Sustainability Measure Based on Types of Product 2

On the contrary, while collected data are classified into four categories based on the size of the factories (considering the number of employees), it shows a clear trend of sustainability. The result reveals that increase in the size of factories reduces the level of sustainability. This trend is clearly visible in all three dimensions of sustainability. The first category of factories (in descending order) is the ones consist of employee more than 5000; it shows the lowest level of sustainability in all three areas. Percentage of sustainability achieved for this category in economic, social and environmental dimensions are 73.29, 74.02 and 73.28. Factories having 1000 or fewer employees are the last category of this classification; this category shows the highest level of sustainability. Percentage achieved for dimensions are 85.08, 86.57 and 84.58. While factories are classified into categories based on their size, two of the categories reached "desired" level and other two at "acceptable" level. Figure 4.14 shows the observed trend in the level of sustainability.

Table 4.13 Assessment of Sustainability Based on Factory Size

	Economic Average	Social Average	Environmental Average
Below 1000	84.95	88.61	86.22
1000-3000	82.65	81.77	82.33
3000-5000	76.60	80.73	78.05
Above 5000	73.86	76.32	73.10
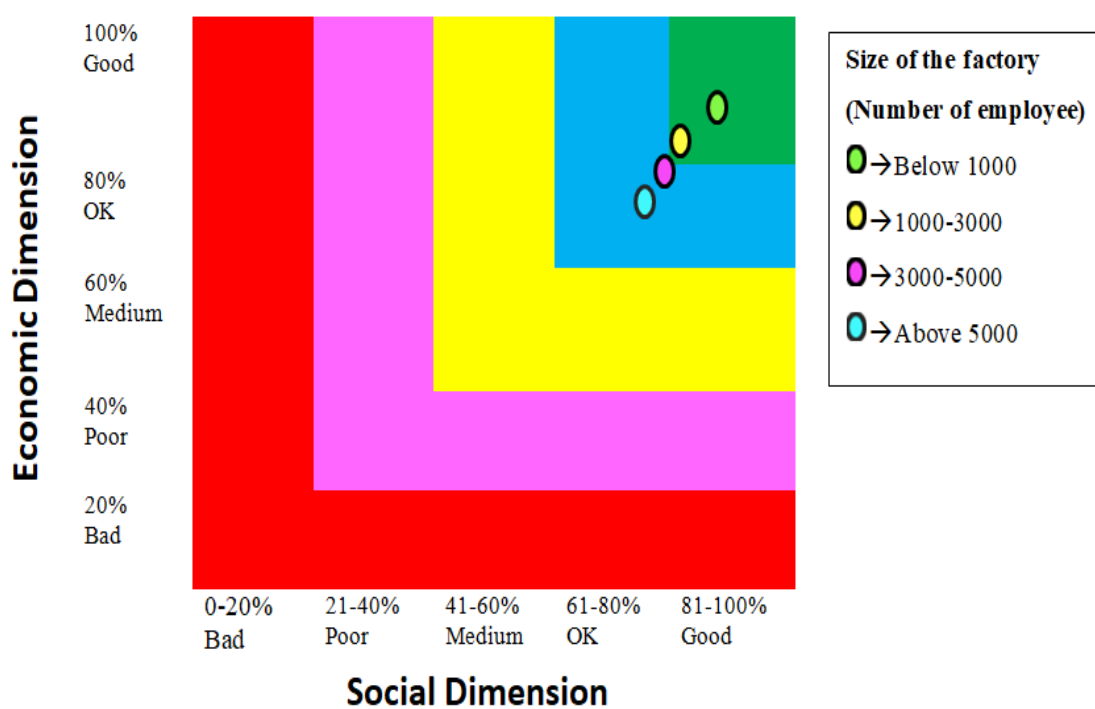
Figure 4.6 Sustainability Measure Based on Factory Size 1
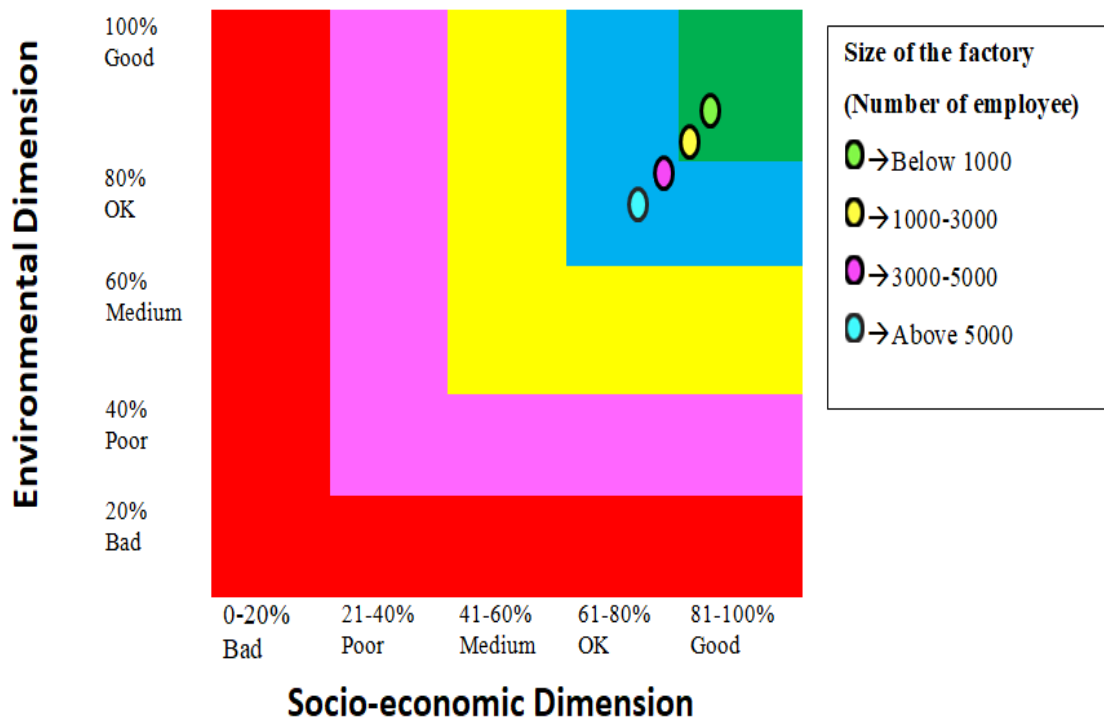
Figure 4.7 Sustainability Measure Based on Factory Size 2

This tendency shows an inverse relationship between the size of the factories and level of sustainability. Correlation analysis also supports this claim; table 4.15 provides the result of the correlation between factory size and level of sustainability for all three dimensions. Factory size shows a significant inverse relationship with all three dimensions of sustainability.

Table 4.14 Correlation between Factory Size and Dimensions of Sustainability

Correlations				
	Number of employees	Econ.post	Env.post	Social.post
Number of employees	1			
Econ	-.364**	1		
Env	-.338**	.635**	1	
Social	-.217**	.610**	.494**	1

Note: ** = Correlation is significant at the 0.01 level (2-tailed).

Econ = Economic dimension mean considering model fit index items from the previous section

Env = Environmental dimension mean considering model fit index items from the previous section

Social = Social dimension mean considering model fit index items from the previous section

CHAPTER 5

DISCUSSION AND CONCLUSION

This chapter wraps-up the study by providing a summary of the full study, discussion of findings, practical implication, recommendation for future research and a conclusion. At first, it provides the summary of the study by answering the research questions, followed by a discussion of findings provided in chapter four. Importance of the findings in the ready-made garments industry is also discussed. Finally, it explains limitations of the study and further research scopes.

5.1 Summary

A brief summary of the purpose of the study, methods of the study and findings are discussed in this section.

The primary objective of this study is to develop a scale to measure sustainability in the ready-made garments industry of Bangladesh and assess the level of sustainability by using that index.

From the research objective mentioned above, three research questions are developed:

1) How could existing sustainability assessment methods be mapped to understand more about sustainability and to compare and contrast them to develop a representative index for RMG sector of Bangladesh?

2) To what extent are the dimensions (and sub-dimensions) of sustainability fit into the overall index and related to each other?

3) To what extent are the RMG factories in Bangladesh sustainable?

To answer the research questions, an extensive literature review has been conducted on sustainable development, ready-made garments sector, green production, scale development and so on. Dimensions and indicators of sustainable development in the RMG sector have been determined at this stage. Based on the literature review a three dimensional model of sustainable development along with its indicators/variables is developed.

To develop the index, primary items are mainly adopted from Sustainable Apparel Coalition (SAC, 2015) and RobecoSAM (2013). Some other questions are developed by the researcher. From primary literature review industry and country-specific items are chosen for the index. After a rigorous study, the index ended up with 62 items which cover all three dimension and ten sub-dimensions of sustainability. A five-point Likert scale is used to develop the index. Face and content validity is tested to check the usability of the 62 items scale. Then the validity and reliability of the questionnaire are tested by a pilot test where 30 RMG professionals took part. The result of the pilot test is found to be satisfactory, therefore, the questionnaire is sent to the respondents. The sample of this study includes Managers and senior officers of Human Resource, Production and Compliance department of Tier 1 RMG factories in Bangladesh. Questionnaires are distributed using all possible channels, which includes email, survey monkey, mail and physical presence. Total of 238 completed questionnaires are considered for further analysis removing incomplete responses.

Data analysis includes item analysis and factor analysis. Independent t-test and item-total correlation are conducted in item analysis. Items retained from the item analysis stage are used for EFA (Exploratory Factor Analysis). EFA has been conducted to screen out non-relevant items. Remaining items from EFA are again used in CFA (Confirmatory Factor Analysis) to test how well items fit in the hypothesized model. Correlation among dimensions of sustainability is tested using the finalized items of sustainability scale. Level of sustainability of RMG factories is assessed at the end by considering overall sustainability, sustainability by product type and sustainability by factory size.

The following section serves as the answers to the research questions.

The first research question of this study is:

How could existing sustainability assessment methods be mapped to understand more about sustainability and to compare and contrast them to develop a representative index for RMG sector of Bangladesh?

To answer this question relevant literature have been reviewed first. Existing literature suggested three dimensions sustainable development which also fit into RMG industry. Sustainable fashion and Bangladesh industry literature also provide variables for the three dimensions of sustainability. Finally, the questionnaire is developed including country and industry-specific items.

After validity check and pilot test, 62 items questionnaire is finalized for the analysis process. Three steps of data analysis process have been conducted. In the first stage, independent t-test and item-total correlation have been run for item analysis. This test suggested removing 12 items. Hence, 50 items are retained for the EFA step. 3 separate EFA have been conducted for three dimensions to test the loading patterns of items on the factor. No items have been removed after EFA. All the 50 items then passed to the CFA step for testing loading of the item on the dimensions. During CFA sub-dimensions are considered as latent variable taking the mean of the items. Two step CFA has been conducted to screen out the non-related items. After CFA process 30 items remained in the proposed RMG sustainability index. This 30-items index provides model fit and fulfill other criteria (RMSEA = 0.070, RMR = 0.024, CFI = 0.967, PNFI = 0.669).

Reliability of developed scale has also been conducted using Cronbach alpha. The result of Cronbach alpha is between 0.826 and 0.910, which show a strong reliability.

The second research question of this study is:

To what extent are the dimensions (and sub-dimensions) of sustainability fit into the overall index and related to each other?

Correlation analysis and standardized regression weight in SEM have been considered to answer this question. Correlation analysis shows that all three dimensions of sustainability are well correlated. The economic dimension of sustainability is positively related to both social ($r=0.71$, $p<0.01$) and environmental

(r=0.82, p<0.01) dimensions of sustainability significantly. Likewise, the social dimension of sustainability is positively related to environmental dimension (r=0.59, p<0.01).

Moreover, all three dimensions load well on overall sustainability index. Standardized loading values are as follows: economic dimension (r=0.996, p<0.001), social dimension (r=0.710, p<0.001) and environmental dimension (r=0.825, p<0.001). Besides, all the sub-dimensions show very strong loading on the three dimensions of sustainability.

The third research question of this study is as follows:

To what extent are the RMG factories in Bangladesh sustainable?

To answer this question level of sustainability is measured using a tool named Barometer of Sustainability. This measurement is done from three different perspectives; firstly, by taking the overall mean, secondly, by considering types of product produced in the factories and finally, by considering factory size in terms of the number of employees.

The result shows that assessed sustainability is at the "acceptable" level for all three dimensions. Classifying the factories based on their product types does not show much difference than the overall sustainability measure. But while factories are segregated based on their size in terms of the number of employees, the result shows a clear trend. Increase in size of factories decreases the level of sustainability in the RMG sector in Bangladesh.

5.2 Discussion

This chapter further discusses the findings and compare and contrast the findings with existing literature. Although sustainable development is a recent phenomenon, there is a number of methods to measure that. But still, sustainability lacks a common method to be measured because of its diverse nature. Some of the methods are widely used but still needed improvement. This study is an attempt to fill such gap in the ready-made garments sector in Bangladesh.

First of all this study provides a three dimensional model of sustainability which is supported by widely acceptable corporate sustainability measures. Three

dimensions of sustainability of this study are first introduced by Elkington in his TBL (Triple Bottom Line) approach. Elkington (1997) first brought all three aspects of sustainability together to hypothesize the modern measure of sustainability (Jamali, 2006). Elkington emphasizes on socially and environmentally responsible behavior by corporations to achieve financial benefit as well as overall improved performance (Gimenez et al., 2012). Although TBL approach is widely accepted and used as the base for sustainability study, it is quite abstract in nature and difficult to implement. There are no proper guidelines how three dimensions should be measured and balanced simultaneously with each other (Lozano, 2012). It is also failed to set up proper boundaries for reporting which could pose a threat to companies to lose reputation (Archel et al., 2008). This study tries to remove the difficulties faced by TBL approach. Although it does not attempt to find a generalized scale, by offering a quantitative measurement approach this study develops a simple scale to measure sustainable development in a certain industry in Bangladesh.

Another major benefit of the index developed in this study is it does not focus on certification of sustainability rather it helps organizations to measure their actual position in sustainability. As environmental sustainability has become a major concern all over the world, there are certain certifications have become important to strive in the business, ISO is one of them. EMS (Environmental Management System) is used for all environmental sustainability certification. Using ISO certification, corporations all over the world reporting the performance of their responsibilities toward environment to stakeholders and the public (Melnyk et al., 2003). But EMS gives freedom to the companies to measure the environmental impact on their own way (Ahlroth et al., 2011). Takakusa (2005) opines that the effectiveness of EMS reduced as companies use that only to report and gain a certificate. Instead of feeling the responsibility toward the environment, companies are keen to possess a certificate. To collect information regarding sustainability is important but it has limited usefulness if not followed by action (Zobel, 2013). Hence, the developed index in this study focuses more on the practice than the certification. Once an organization achieves satisfactory result using this scale, it can go for a further certification from any recognized authority. Moreover, EMS focuses on certain aspects of sustainability rather than as a whole but this index measures all the areas of sustainability.

Corporate Social Responsibility (CSR) plays an important role in the area of social sustainability. CSR is a concept of integrating social and environmental concerns in their operations as well as their day to day interactions with stakeholders (European Commission, 2001). Although widely used, no consensus of a common definition has been made yet for CSR. The concept is used differently in the different area of knowledge. Hence, there is no standardized common measure has developed. Furthermore, it has a bias towards economic and social dimensions, the third dimension, environment, is mostly ignored (Dahlsrud, 2008). This made it incomplete as a sustainability measure. This study considers CSR as an important concept and integrates that as a part of social dimension along with other two.

Indicators of social and environmental dimensions of this study are adopted and modified from an index named Higg index provided by Sustainable Apparel Coalition (SAC), which is specifically given for apparel industry. In spite of adding detail measure for important constructs of the above mentioned two dimensions, Higg index cannot be fully implemented in the RMG sector of Bangladesh. Lack of instruments/methods to measure certain variables made it unusable for the companies, especially for medium and small ones. Besides, it lacks holistic view as the economic dimension is not added there. Similar issues observed in the measure provided by GRI (global reporting initiative). The variables for Higg index is adopted from GRI which includes even more indicators for sustainability. This made GRI too big to handle. To resolve this issue, this index only considered the indicators and items from all three dimensions which could be readily applicable and easily measurable in the ready-made garments sector of Bangladesh.

Besides, this study assesses the level of sustainability of the RMG factories in Bangladesh based on a modified version of the assessment method named sustainability barometer (Prescott-Allen, 2001). Assessment result shows that overall level of sustainability of the sample factories is below 80 percent, which is labeled as "acceptable". Both the graphs on this measurement scale provide the similar result which shows the consistency in their sustainability practices in all three dimensions.

Later RMG factories are divided into categories based on their product types. All three common categories of RMG products (knitting, woven, knitting and woven) producers show a result similar to and consistent with the overall level of

sustainability. Only "others" category (it includes products like linen, terry towel and so on) provides a better result and lift itself to the "desirable" level.

Sample RMG factories are also divided into several categories based on their relative size (in terms of the number of employees) to check whether factory size has any effect on the level of sustainability. This time a clear trend is visible which shows an inverse relationship between factory size and level of sustainability. It implies that relatively smaller factories have better sustainability practice. This result is contradictory to the result of Bansal (2005)'s study. In her study, Bansal showed a positive relationship between firm size and corporate sustainable development. However, firm size was one of her control variable and the study conducted by taking the sample from forestry, mining and oil and gas industry of Canada. Moreover, firm size was calculated by taking the natural log of the assets in that study which shows a positive relationship with corporate sustainability whereas an independent variable "organizational slack", which is very similar in nature, shows a negative relationship.

The similar effort given by Gallo and Christensen (2011); they also hypothesized positive relationship of sustainability with the size of the firm. But their hypothesis was not supported by their analysis.

Relationship of factory size and remediation financing and efforts are also tested in the ready-made garments sector of Bangladesh by a joint study team of ILO (International Labor Organization) and IFC (International Finance Corporation). Although this study also suggests a negative relationship between factory size and sustainability effort (which considers only safety concerns), it provides important information to explain the opposite phenomenon observed in this study. Based on its analysis the report suggests that sustainability effort given by the factory depends on international buyers request and relationship with factory (IFC, & ILO, 2016). Some brands are very keen to maintain sustainable supply chain because of its reputation in international market. Most of the small-sized tier 1 factories depend on one or two international brands because of their production capacity which is not same for the larger factories. This dependency on the limited number of brands made small factories concerned about their reputation towards buyers.

5.3 Limitations of the Study

This study is not beyond limitations. Several limitations observed during the research process are as follows:

First of all, acquiring data was the major limitation of this research. Companies are found to be reluctant to provide data related to the sustainable development to an independent researcher. Some of the areas discussed in this index are considered as confidential for the companies. Although confidentiality was assured, many factories denied to response the questionnaire. Companies operating in this sector have fear to confront both government and brands. Sometimes employees were not courageous enough to provide data as they fear losing the job for disclosing some information which they should not. For this reason, it took more than two months to collect sufficient data to conduct the analysis.

Second, some respondents had difficulties to answer the questions as they did not have enough knowledge on those areas. Lack of proper training to the responsible employees is visible in some factories. As this is not a general phenomenon, it is not an issue of the whole industry rather factory specific problem. Huge gap in knowledge and practice is observed from factory to factory.

Third, there are several types of factories in RMG sector of Bangladesh; some are the direct supplier to the brands (Tier 1), some others are simply "sub-contractor." In such situation, it is hard to generalize as these organizations have different compliance and management style. The focus of this study is only tier 1 factories, half of the total RMG factories in Bangladesh. Sometimes serious complains regarding environmental and human resource malpractice in sub-contract factories is heard. Separate researches might be needed to identify issues and ways to solve them in such factories.

Fourth, the questionnaire of this research adopted five-point Likert scale which purely based on the perception of the respondent. Although this is widely used and acceptable measure, some questions on the questionnaire deserve more detail and/or quantitative answer. But again asking for such fact is not possible as employees might not have access to them or those very are confidential information.

Finally, this study adopts a deductive approach of item generation which limits the freedom of adding items beyond prescribed definition. As the definitions of dimensions and variables are adopted from existing literature, it is difficult to add new phenomena in the industry beyond previous research. To solve this issue, research considering inductive approach should be conducted.

5.4 Future Research

Further research needed to address above mentioned issues and to replicate the developed index of this study.

To avoid data collection difficulties, research should be conducted with the collaboration of government agencies and international brands. Although some organizations are working on it, a combined effort should be given to overcome the hurdles. Such collaboration may also educate responsible employees to help the research effectively.

Other approaches of research should be considered to conduct such study which includes, but not limited to, quantitative research other than Likert scale, qualitative fact findings by interviewing CEOs, an inductive approach of item generation.

Researches in sub-contract factories are badly needed to understand the reason for such malpractice and to propose solutions. A mishap in such factory may ruin the reputation of the whole industry.

The developed item for RMG industry of Bangladesh should be tested in other related industry such as tannery, shoe and so on. Moreover, major RMG supplier countries should replicate this to test this developed measure.

5.5 Recommendation for Practice

A reliable and valid sustainability measure is very important for industries, especially for the one like ready-made garments sector in Bangladesh. This index might help companies to assess their performance in sustainable development. Sustainable development is urgent for both company and stakeholders. By developing

sustainably companies increase their potential to survive and compete well. On the other hand, stakeholders get the assurance that they are not exploited and their rights are reserved. Developed index in this study would serve companies as the first step to evaluate their position in sustainability. This would also help them to identify existing problems in the company and might suggest ways to improve that.

As RMG sector in Bangladesh largely dependent on the European and American market, companies have to comply with the customers' demand of those market. Social and environmental awareness all over the world made consumers concerned about sustainable products. And aware consumers do not want to buy a product from a company which has a reputation for not producing sustainably. Major brands taking this seriously, they do not want place order to a supplier that does not maintain sustainable development. Developed index in this study could help companies in this regard. Continuous assessment of sustainability could assure companies that they are on right track. Recent incidents in RMG sector of Bangladesh brought bad reputation to factories of this sector. To regain trust from both brands and consumers all the factories of this industry should undergo sustainability check.

5.6 Conclusion

Ready-made garments sector has become the lifeblood of Bangladesh's export. Besides, huge numbers of people are employed there; a statistics showed that about 18 to 20 million people earn their livings from this sector (both directly and indirectly) (Bhuiyan, 2013). For lack of sustainable practice very often factories of this industry face unavoidable adverse situations such as employee unrest, accidents, high turnover, low productivity and so on which eventually bring financial and reputational loss.

Making a sustainable business strategy and practicing that is urgent at this point for the factories of that industry. Sustainability index developed in this research will help all the interested parties including government, factory owners, business associations and international buyers, to assess and monitor sustainable development in this sector.

The main focus of this study is to gather country and industry-specific variables for sustainable development of Ready-made garments sector in Bangladesh

and developing an index by running quantitative analysis on the collected items under discussed variables. This research came up with ten variables (sub-dimensions) under three dimensions (economic, social and environmental dimensions). Through multi-step data analysis process this research provides an 18-items sustainability index for the RMG sector in Bangladesh. Data analysis shows that finalized version of index fits well and provide adequate validity and reliability.

Developed index in this study could be used as a base for similar scales in other industries. Proper use of this index could help RMG factories in Bangladesh to overcome the difficulties they face in regard to sustainability.

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APPENDICES

APPENDIX A

QUESTIONNAIRE (ENGLISH)

Development of Sustainability index for the Ready-made Garments Sector in Bangladesh

This questionnaire is a part of a PhD dissertation. The purpose of this study is to develop a sustainability index for Ready-made garments sector of Bangladesh and measure sustainable development in the RMG sector. You are requested to complete the form carefully and accurately in order to guarantee the accuracy of data collected.

All data received from this questionnaire will be used for the study purpose only. Information provided here would be considered confidential. Your kind cooperation is highly appreciated.

General Information

Location of the Facility/factory:	
Size of the Facility (in terms of number of employees):	
Product Type (Knitting, Woven etc.):	
Position of the Respondent:	
Age of the Respondent:	

Please complete the following questionnaire by placing a CROSS (X) in the appropriate box

1. Economic Dimension

		Never True	Rarely True	Sometimes True	Often True	Always True
1.1 Risk and Crisis Management						
1.1.1	Specific committees /departments /persons are responsible and accountable for enterprise risk management at the facility in terms of risk appetite and tolerance as well as risk monitoring & reporting.	☐	☐	☐	☐	☐
1.1.2	The facility performs a risk analysis for financial risk, operational risk, market risks, strategic business risks and compliance risks.	☐	☐	☐	☐	☐
1.1.3	The facility defines all above mentioned risks clearly for the organization.	☐	☐	☐	☐	☐
1.1.4	There are strategies of financial incentives to senior executives and line managers in order to promote and enhance an effective risk culture throughout the organization	☐	☐	☐	☐	☐
1.1.5	This facility measures continuous improvement in risk management practices through involvement of employees in structured feedback process,	☐	☐	☐	☐	☐
1.1.6	This facility has a proper training program in place throughout the organization on risk management principles,	☐	☐	☐	☐	☐

	Never True	Rarely True	Sometimes True	Often True	Always True
1.2 Compliance					
1.2.1 Corporate codes of conduct have been defined at the facility for corruption & bribery and Money-laundering and/or insider trading/dealing	☐	☐	☐	☐	☐
1.2.2 Corporate codes of conduct have been defined at the facility for discrimination, Confidentiality of information and Antitrust/anticompetitive practices	☐	☐	☐	☐	☐
1.2.3 Responsibilities, accountabilities and reporting lines are systemically defined in all divisions	☐	☐	☐	☐	☐
1.2.4 Employee performance appraisal systems integrates compliance/codes of conduct	☐	☐	☐	☐	☐
1.2.5 Disciplinary actions are in place in case of breach of COC, i.e. warning, dismissal, zero tolerance policy	☐	☐	☐	☐	☐
1.2.6 Dedicated help desks, hot lines and/or complaint boxes are in place.	☐	☐	☐	☐	☐
1.3 Supply Chain Management					
1.3.1 The facility defined a formal process to identify critical suppliers (e.g. high volume suppliers, suppliers of critical components, non-substitutable suppliers)	☐	☐	☐	☐	☐

		Never True	Rarely True	Sometimes True	Often True	Always True
1.3.2	The facility has a formalized process in place to identify sustainability risks in the supply chain	☐	☐	☐	☐	☐
1.3.3	The facility has taken measures in order to manage sustainability risks amongst your tier 1 suppliers on Environmental and human rights (ILO convention, e.g. forced or child labor, freedom of association) standards for supplier's processes, products or services	☐	☐	☐	☐	☐
1.3.4	The facility experienced sustainability initiatives in the supply chain that have delivered clear business benefits (in terms of either cost reduction, risks reduction or revenues growth) and indicate the benefits generated from these initiatives.	☐	☐	☐	☐	☐
1.3.5	All the tier 1 suppliers have been assessed as a part of ongoing monitoring of suppliers process	☐	☐	☐	☐	☐
1.3.6	The facility undertake a spend analysis of its supply chain	☐	☐	☐	☐	☐
1.4 **Financial Performance**						
1.4.1	The facility has a formalized strategy in place to increase total sales volume	☐	☐	☐	☐	☐
1.4.2	The facility has a long-term plan for improving overall financial performance	☐	☐	☐	☐	☐

		Never True	Rarely True	Sometimes True	Often True	Always True
1.4.3	The facility has proper plan in place to increase market share	☐	☐	☐	☐	☐
1.4.4	The facility experienced significant growth in total revenue during the current year	☐	☐	☐	☐	☐
1.4.5	The facility observed significant growth in Return on Assets (ROA) during the current year.	☐	☐	☐	☐	☐
1.4.6	The facility has demonstrated improvement in overall financial performance	☐	☐	☐	☐	☐

2. Environmental Dimension

	Never True	Rarely True	Sometimes True	Often True	Always True
2.1 EMS					
2.1.1 One or more members of management are specifically responsible for environmental management activities.	☐	☐	☐	☐	☐
2.1.2 This facility has been in compliance with all legal requirements/permits during the past 12 months	☐	☐	☐	☐	☐
2.1.3 The facility has a formal environmental management system or program aimed at understanding and continually improving this site's environmental impacts.	☐	☐	☐	☐	☐
2.1.4 This site's environmental management systems certified and/or audited by an independent third party auditor or an accredited internal auditor	☐	☐	☐	☐	☐
2.1.5 This facility has an overarching environmental strategy that prioritizes impact reduction areas and sets long-term targets (3-5+ years) to achieve significant environmental performance improvements	☐	☐	☐	☐	☐
2.1.6 This site has a program or system for monitoring environmental regulations and permits required for operation	☐	☐	☐	☐	☐

	Never True	Rarely True	Sometimes True	Often True	Always True
2.2 Energy Use and Emission to Air					
2.2.1 This site calculates and tracks, at least annually, its energy use and greenhouse gas emissions	☐	☐	☐	☐	☐
2.2.2 This site sets and reviews at least annually improvement targets for reducing energy use (including fuel use for on-site transportation if applicable)	☐	☐	☐	☐	☐
2.2.3 This site has had an energy audit conducted in the last three years by a certified professional to identify potential energy and cost savings	☐	☐	☐	☐	☐
2.2.4 This site has implemented energy conservation or efficiency measures	☐	☐	☐	☐	☐
2.2.5 This site sets and reviews at least annually improvement targets for reducing emission to air	☐	☐	☐	☐	☐
2.2.6 This site has demonstrated evidence of reducing energy use and emission to air	☐	☐	☐	☐	☐
2.3 Waste, Wastewater and Chemical Management					
2.3.1 This site monitors the quantity and quality of waste and wastewater produced	☐	☐	☐	☐	☐
2.3.2 This site segregates hazardous and non-hazardous waste and provides training to personnel on handling and segregating waste	☐	☐	☐	☐	☐

		Never True	Rarely True	Sometimes True	Often True	Always True
2.3.3	This site sets and reviews at least annually improvement targets to reduce the quantity of waste generated	☐	☐	☐	☐	☐
2.3.4	This facility systematically monitors applicable chemical use regulations on a regular basis to ensure compliance and to identify new or changing compliance requirements	☐	☐	☐	☐	☐
2.3.5	This facility has a business process to ensure compliance with all Restricted Substance Lists (RSLs) for brands it does business with	☐	☐	☐	☐	☐
2.3.6	This facility has reduced the use of chemicals by the substitution of biological enzymes in at least one of the processes	☐	☐	☐	☐	☐

3. Social Dimension

		Never True	Rarely True	Sometimes True	Often True	Always True
3.1 **Labor and Workforce Management**						
3.1.1	All workers are provided with a legally recognized, written contract or agreement and an employee handbook and training on the contents of that.	☐	☐	☐	☐	☐
3.1.2	Workers are paid on time by cash or direct debit on their account for last one year	☐	☐	☐	☐	☐
3.1.3	There is a written policy on employee handbook, formal contract paper, food and transportation facilities and other benefits.	☐	☐	☐	☐	☐
3.1.4	Food and Transportation subsidies and/or free food and transportation is provided to the workers.	☐	☐	☐	☐	☐
3.1.5	There is a written policy on hours of work, days off, overtime hours, grievance procedure, and it applies to all workers in the Facility.	☐	☐	☐	☐	☐
3.1.6	Facility is aware of the diverse workforce in the community and actively recruits members from a diverse population.	☐	☐	☐	☐	☐
3.2 **Workplace Management**						
3.2.1	Facility provides means and opportunities for workers to increase health awareness and/or develop life skills and provides free, voluntary and confidential medical screening	☐	☐	☐	☐	☐

		Never True	Rarely True	Sometimes True	Often True	Always True
	on an ongoing basis.					
3.2.2	All machines with a pinching, puncturing or cutting risk have properly functioning safety guards, safety controls and/or emergency stops in place and all employees are trained on PPE and safety procedures.	☐	☐	☐	☐	☐
3.2.3	The Facility has a building construction authentic certification certificate from the agency responsible for authorizing construction in that country with the number of floors authorized in the certificate matching the number of floors that exist in the building today. Furthermore, electrical wiring throughout the Facility is in full compliance with local regulations.	☐	☐	☐	☐	☐
3.2.4	Facility has clearly written policy on health awareness program, risky machine operation training and fire drill.	☐	☐	☐	☐	☐
3.2.5	Facility has policy of inspecting building construction, shelves inside and outside the wall, electric wiring, fire exits and assembly point.	☐	☐	☐	☐	☐
3.2.6	At least 2 unlocked exits exist in each production and dormitory area/floor.	☐	☐	☐	☐	☐

	Never True	Rarely True	Sometimes True	Often True	Always True
3.3 Stakeholder engagement and Community Impact					
3.3.1 Facility has a policy of engaging with local, regional and international stakeholders to improve working condition and to address issues of concern.	☐	☐	☐	☐	☐
3.3.2 Facility participates in multi-stakeholder or industry forums to develop a full understanding of the risks and challenges in the value chain	☐	☐	☐	☐	☐
3.3.3 Facility engages with key local /regional / international stakeholders to improve working conditions in the value chain.	☐	☐	☐	☐	☐
3.3.4 Facility engages (either directly or via industrial trade association or tripartite initiatives) with local & district level Trade Unions to proactively address issues of concern to the industry.	☐	☐	☐	☐	☐
3.3.5 Facility has sponsored (paid for and/or organized) a community service event within the last 12 months.	☐	☐	☐	☐	☐
3.3.6 Facility makes regular donations to charitable (non-profit/non-governmental) organizations or projects.	☐	☐	☐	☐	☐
3.3.7 Facility has implemented innovative community projects that improve the social	☐	☐	☐	☐	☐

		Never True	Rarely True	Sometimes True	Often True	Always True
	well-being of workers and their families.					
3.3.8	Facility has a policy of community services which includes regular charity, development of employee and their family members and local community members' lives.	☐	☐	☐	☐	☐

APPENDIX B

QUESTIONNAIRE (BENGALI)

বাংলাদেশের তৈরী পোশাক শিল্পের জন্য সাস্টেনিবিলিটি সূচক প্রণয়ন
(Development of Sustainability index for the Ready-made Garments Sector in Bangladesh)

এই প্রশ্নাবলী একটি গবেষণার অংশ। এই গবেষণার উদ্দেশ্য বাংলাদেশের তৈরি পোশাক খাতের জন্য একটি টেকসই সূচক তৈরি করা এবং তৈরি পোশাক খাতের টেকসই উন্নয়ন পরিমাপ। নির্ভুল তথ্য সংগ্রহের প্রয়োজনে সাবধানে এবং সঠিকভাবে ফর্ম পূরণ করার জন্য অনুরোধ করা হলো।

এই প্রশ্নাবলী থেকে প্রাপ্ত সকল তথ্য শুধুমাত্র গবেষণার উদ্দেশ্যে ব্যবহার করা হবে এবং গোপনীয় বিবেচনা করা হবে। আপনার সহযোগিতার জন্য আন্তরিক ধন্যবাদ।

সাধারণ জ্ঞাতব্য

কারখানার অবস্থান:	
কারখানার আকার (কর্মচারীদের সংখ্যার প্রেক্ষিতে):	
প্রোডাক্ট টাইপ (নিটিং, উভেন ইত্যাদি):	
উত্তরদাতার পদ (Position):	
উত্তরদাতার বয়স:	

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অনুগ্রহ করে উপযুক্ত বাক্সে একটি ক্রস (X) স্থাপন করে নিম্নলিখিত প্রশ্নাবলী পূরণ করুন

1. অর্থনৈতিক মাত্রা

	সম্পূর্ণ একমত নয়	একমত নয়	একমত বা একমত নয় কোনোটিই নয়	একমত	সম্পূর্ণ একমত
1.1 ঝুঁকি ও সংকট ব্যবস্থাপনা					
1.1.1 নির্দিষ্ট কমিটি/দপ্তর/ব্যক্তি ঝুঁকি গ্রহণ এবং সহনশীলতার (Risk appetite and tolerance) পরিপ্রেক্ষিতে কারখানার ঝুঁকি ব্যবস্থাপনা এবং ঝুঁকি পর্যবেক্ষণ ও প্রতিবেদন করার জন্য দায়িত্বপ্রাপ্ত	☐	☐	☐	☐	☐
1.1.2 এই কারখানা আর্থিক ঝুঁকি, কর্ম ঝুঁকি (Operation), বাজার ঝুঁকি, কৌশলগত ব্যবসা ঝুঁকি এবং কমপ্লায়েন্স ঝুঁকির জন্য একটি ঝুঁকি বিশ্লেষণ (Risk analysis) পরিচালনা করে	☐	☐	☐	☐	☐
1.1.3 কারখানা প্রতিষ্ঠানের জন্য পরিষ্কারভাবে সব উপরোক্ত ঝুঁকি সংজ্ঞায়িত করে.	☐	☐	☐	☐	☐
1.1.4 সর্বত্র প্রচার এবং একটি কার্যকর ঝুঁকি সংস্কৃতি উন্নত করার জন্য ঊর্ধ্বতন কর্মকর্তারা এবং লাইন ম্যানেজারদের আর্থিক প্রণোদনার কৌশল আছে	☐	☐	☐	☐	☐
1.1.5 এই কারখানা, কাঠামোবদ্ধ প্রতিক্রিয়া প্রক্রিয়ায় কর্মীদের সম্পৃক্ততার মাধ্যমে ঝুঁকি ব্যবস্থাপনার মধ্যে ক্রমাগত উন্নতি পরিমাপ করে	☐	☐	☐	☐	☐
1.1.6 এই কারখানায় ঝুঁকি ব্যবস্থাপনা নীতির উপর একটি সঠিক প্রশিক্ষণ প্রোগ্রাম আছে	☐	☐	☐	☐	☐

	কখনো সত্য নয়	কদাচিৎ সত্য	কখনো কখনো সত্য	প্রায়ই সত্য	সর্বদাই সত্য
1.2 কমপ্লায়েন্স					
1.2.1 দুর্নীতি ও ঘুষ অর্থ আত্মসাতের এবং/অথবা ইনসাইডার ট্রেডিং এর জন্য কারখানায় কর্পোরেট আচরণবিধি সংজ্ঞায়িত করা হয়েছে	☐	☐	☐	☐	☐
1.2.2 বৈষম্য, তথ্য গোপনীয়তা এবং Antitrust/anticompetitive চর্চার জন্য কারখানায় কর্পোরেট আচরণবিধি সংজ্ঞায়িত করা হয়েছে	☐	☐	☐	☐	☐
1.2.3 দায়িত্ব, জবাবদিহিতা এবং প্রতিবেদন পদ্ধতি প্রণালীগতভাবে সব বিভাগের মধ্যে সংজ্ঞায়িত করা হয়	☐	☐	☐	☐	☐
1.2.4 কর্মচারী কর্মক্ষমতা মূল্যায়ন ব্যবস্থা কর্পোরেট আচরণবিধি মেনে করা হয়	☐	☐	☐	☐	☐
1.2.5 COC ভঙ্গের জন্য শৃঙ্খলামূলক ব্যবস্থা বিদ্যমান, যেমন, সতর্কবার্তা, বরখাস্ত, জিরো টলারেন্স নীতি	☐	☐	☐	☐	☐
1.2.6 নিবেদিত সহায়তা ডেস্ক, হট-লাইন এবং/অথবা অভিযোগ বাক্স রয়েছে	☐	☐	☐	☐	☐
1.3 সাপ্লাই চেইন ম্যানেজমেন্ট					
1.3.1 কারখানায় ক্রিটিক্যাল সরবরাহকারী সনাক্ত করার জন্য একটি আনুষ্ঠানিক প্রক্রিয়া সংজ্ঞায়িত (উদাঃ উচ্চ মাত্রার যোগানদার, ক্রিটিক্যাল উপাদান সরবরাহকারী, অপ্রতিস্থাপনযোগ্য সরবরাহকারী)	☐	☐	☐	☐	☐

		কম্পূলো সম্মত নয়	কম্পূলিত সম্মত	কম্পূলো কম্পূলো সম্মত	প্রায়ই সম্মত	সম্পূর্ণ সম্মত
1.3.2	কারখানায় সাপ্লাই চেইনের sustainability ঝুঁকি চিহ্নিত করার একটি বিধিবদ্ধ প্রক্রিয়া রয়েছে	☐	☐	☐	☐	☐
1.3.3	কারখানা Tier 1 সরবরাহকারীদের প্রক্রিয়া, পণ্য বা পরিষেবার ক্ষেত্রে পরিবেশগত ও মানবাধিকার(ILO কনভেনশন, উদাঃ জোরপূর্বক বা শিশুশ্রম, সংগঠন করার স্বাধীনতা) ঝুঁকি ব্যবস্থাপনার জন্য পদক্ষেপ নিয়েছে	☐	☐	☐	☐	☐
1.3.4	কারখানায় সাপ্লাই চেইন এর জন্য যে sustainability উদ্যোগ নেয়া হয়েছে তা থেকে স্পষ্ট ব্যবসার সুবিধা উপভোগ করেছে (ব্যয় কিংবা ঝুঁকি হ্রাস বা আয় বৃদ্ধির)	☐	☐	☐	☐	☐
1.3.5	সকল Tier 1 সরবরাহকারী চলমান সরবরাহকারী পর্যবেক্ষণ প্রক্রিয়ার একটি অংশ হিসাবে মূল্যায়িত হয়েছে	☐	☐	☐	☐	☐
1.3.6	কারখানা সাপ্লাই চেইন এর নিয়মিত ব্যয় বিশ্লেষণ (Spend analysis) করে	☐	☐	☐	☐	☐
1.4 **আর্থিক পারফরমেন্স**						
1.4.1	কারখানায় মোট বিক্রয় ভলিউম বৃদ্ধির একটি বিধিবদ্ধ কৌশল রয়েছে	☐	☐	☐	☐	☐
1.4.2	কারখানায় সামগ্রিক আর্থিক কর্মক্ষমতা উন্নত করার জন্য একটি দীর্ঘ মেয়াদী পরিকল্পনা রয়েছে	☐	☐	☐	☐	☐

		একেবারেই সত্য নয়	কিছুটা সত্য	একেবারে একেবারে সত্য	প্রায়ই সত্য	একমত সম্পূর্ণ (সম্পূর্ণ একমত)
1.4.3	কারখানা মার্কেট শেয়ার বৃদ্ধি করার সঠিক পরিকল্পনা রয়েছে	☐	☐	☐	☐	☐
1.4.4	কারখানায় বর্তমান বছরে মোট আয় উল্লেখযোগ্য হারে বৃদ্ধি পরিলক্ষিত	☐	☐	☐	☐	☐
1.4.5	কারখানায় বর্তমান বছরে ROA বৃদ্ধিও পরিলক্ষিত.	☐	☐	☐	☐	☐
1.4.6	কারখানা সামগ্রিক আর্থিক পারফরম্যান্সের উন্নতি প্রদর্শিত হয়েছে	☐	☐	☐	☐	☐

2. পরিবেশগত মাত্রা

	সম্পূর্ণ সহমত নয়	কিছুটা সহমত	সম্পূর্ণ করতো কতটা সহমত	প্রায়ই সহমত	সম্পূর্ণ সহমত
2.1 পরিবেশ ব্যবস্থাপনা পদ্ধতি (EMS)					
2.1.1 এক বা একাধিক ব্যবস্থাপনা কর্মকর্তা পরিবেশ ব্যবস্থাপনা কার্যক্রম জন্য বিশেষভাবে দায়িত্বপ্রাপ্ত.	☐	☐	☐	☐	☐
2.1.2 গত 12 মাসে এই কারখানা সব পরিবেশগত আইনি প্রয়োজনীয়তা/পারমিট সঙ্গে সঙ্গতিপূর্ণ	☐	☐	☐	☐	☐
2.1.3 কারখানায় একটি আনুষ্ঠানিক পরিবেশগত ম্যানেজমেন্ট সিস্টেম বা প্রোগ্রাম রয়েছে যা পরিবেশগত প্রভাব বোঝার এবং ক্রমাগত উন্নতি সাধনের লক্ষ্যে কাজ করে যাচ্ছে।	☐	☐	☐	☐	☐
2.1.4 এই সাইটটির পরিবেশগত ম্যানেজমেন্ট সিস্টেম একটি স্বাধীন তৃতীয় পক্ষের নিরীক্ষক বা একটি স্বীকৃত অভ্যন্তরীণ নিরীক্ষক দ্বারা প্রত্যয়িত এবং / অথবা নিরীক্ষিত	☐	☐	☐	☐	☐
2.1.5 এই কারখানা একটি পরিবেশ কৌশল বিদ্যমান যা পরিবেশগত প্রভাব হ্রাসের ক্ষেত্রে অগ্রাধিকার দেয় এবং গুরুত্বপূর্ণ পরিবেশগত কর্মক্ষমতা উন্নতি অর্জন করার দীর্ঘমেয়াদী (৩-৫+ বছর) লক্ষ্যমাত্রা নির্ধারণ করে	☐	☐	☐	☐	☐
2.1.6 এই কারখানায় দৈনন্দিন অপারেশনের জন্য প্রয়োজনীয় পরিবেশগত প্রবিধান এবং পারমিট	☐	☐	☐	☐	☐

	কখনো সত্য নয়	কদাচিৎ সত্য	কখনো কখনো সত্য	প্রায়ই সত্য	সর্বদাই সত্য
পরিবীক্ষণের একটি প্রোগ্রাম বা সিস্টেম রয়েছে					

2.2 জ্বালানি ব্যবহার এবং বায়বীয় নিঃসরণ

	কখনো সত্য নয়	কদাচিৎ সত্য	কখনো কখনো সত্য	প্রায়ই সত্য	সর্বদাই সত্য
2.2.1 এই কারখানা অন্তত বছরে একবার জ্বালানি ব্যবহার এবং গ্রিন হাউস গ্যাস নির্গমন হিসাব এবং পর্যবেক্ষণ করে	☐	☐	☐	☐	☐
2.2.2 এই কারখানা অন্তত বছরে একবার জ্বালানি (অন-সাইট পরিবহনে ব্যবহৃত ইন্ধন সহ, যেখানে প্রযোজ্য) ব্যবহার হ্রাসের লক্ষ্যমাত্রা নির্ধারণ এবং রিভিউ করে	☐	☐	☐	☐	☐
2.2.3 এই কারখানায় একটি প্রত্যয়িত পেশাদার নিরীক্ষক দ্বারা গত তিন বছরে (অন্তত একবার) শক্তি এবং খরচ সঞ্চয়ের নিমিত্তে একটি শক্তি নিরীক্ষা (Energy Audit) পরিচালিত হয়েছে	☐	☐	☐	☐	☐
2.2.4 এই কারখানা শক্তি সংরক্ষণ বা দক্ষতা ব্যবস্থা বাস্তবায়ন করেছে	☐	☐	☐	☐	☐
2.2.5 এই কারখানা অন্তত বছরে একবার বায়বীয় নিঃসরণ ব্যবহার হ্রাসের লক্ষ্যমাত্রা নির্ধারণ এবং রিভিউ করে	☐	☐	☐	☐	☐
2.2.6 এই কারখানা শক্তি (Energy) ব্যবহার এবং নির্গমন হ্রাসের প্রমাণ দেখিয়েছে	☐	☐	☐	☐	☐

	কম্পূর্ণ সত্য নয়	কিছুটা সত্য	কম্পূর্ণ কম্পূর্ণ সত্য	প্রায়ই সত্য	সম্পূর্ণ সত্য
2.3 বর্জ্য, তরল বর্জ্য ও রাসায়নিক ব্যবস্থাপনা					
2.3.1 এই কারখানা উত্পাদিত আবর্জনা ও তরল বর্জ্যের মান এবং পরিমাণ নিরীক্ষণ করে	☐	☐	☐	☐	☐
2.3.2 এই কারখানা বিপজ্জনক এবং অ বিপজ্জনক বর্জ্য পৃথক এবং হ্যান্ডলিং ও বর্জ্য পৃথকীকরনের উপর কর্মীদের প্রশিক্ষণ দেয়	☐	☐	☐	☐	☐
2.3.3 এই কারখানা উত্পন্ন বর্জ্য পরিমাণ কমাতে বার্ষিক উন্নয়ন লক্ষ্যমাত্রা নির্ধারণ এবং রিভিউ করে	☐	☐	☐	☐	☐
2.3.4 এই কারখানা কমপ্লায়েন্স নিশ্চিত করতে এবং নতুন বা পরিবর্তিতো নিয়ম মেনে চলার নিমিত্তে নিয়মিত ভিত্তিতে প্রযোজ্য রাসায়নিক ব্যবহারের নিয়মাবলী নিরীক্ষণ করে	☐	☐	☐	☐	☐
2.3.5 যে সকল ব্র্যান্ডের সঙ্গে ব্যবসা আছে তাদের সীমাবদ্ধ পদার্থ লিস্ট (RSLs) এর সঙ্গে সঙ্গতিপূর্ণ অপারেশন নিশ্চিত করনে একটি বিজনেস প্রসেস রয়েছে	☐	☐	☐	☐	☐
2.3.6 এই কারখানা অন্তত একটি জৈবিক এনজাইম প্রতিকল্পন দ্বারা রাসায়নিকের ব্যবহার কমিয়েছে	☐	☐	☐	☐	☐

3. সামাজিক মাত্রা

		করতো সমতা নাহ	কদাচিৎ সমতা	করতো করতো সমতা	প্রায়ই সমতা	সবসময় সমত
3.1 শ্রমিক ও জনশক্তি ব্যবস্থাপনা						
3.1.1	সকল শ্রমিকদের একটি আইনত স্বীকৃত, লিখিত চুক্তি এবং একটি কর্মী হ্যান্ডবুক প্রদান করা হয় ও হ্যান্ডবুকের বিষয়বস্তুর উপর প্রশিক্ষণ দেয়া হয়	☐	☐	☐	☐	☐
3.1.2	কর্মচারীদের বেতন গত এক বছরে সময়মতো নগদ বা ডাইরেক্ট ডেবিট এর মাধ্যমে পরিশোধ করা হয়েছে	☐	☐	☐	☐	☐
3.1.3	কর্মচারী হ্যান্ডবুক, আনুষ্ঠানিক চুক্তিপত্র, খাদ্য ও পরিবহন সুবিধা এবং অন্যান্য বেনিফিটের একটি লিখিত নীতি বিদ্যমান	☐	☐	☐	☐	☐
3.1.4	খাদ্য ও পরিবহন ভর্তুকি ও / বা বিনামূল্যে খাবার এবং পরিবহন শ্রমিকদের প্রদান করা হয়	☐	☐	☐	☐	☐
3.1.5	কাজের ঘন্টা, ছুটি, ওভারটাইম ঘন্টা, অভিযোগ পদ্ধতি উপর একটি লিখিত নীতি রয়েছে , এবং এটি সব কর্মীদের জন্য প্রযোজ্য	☐	☐	☐	☐	☐
3.1.6	কারখানা বৈচিত্র্যময় জনশক্তির (workforce Diversity) ব্যাপারে সচেতন এবং সক্রিয়ভাবে বিভিন্ন সম্পদায় থেকে সদস্যদের নিয়োগ দিয়ে থাকে	☐	☐	☐	☐	☐

	কখনো সত্য নয়	কদাচিৎ সত্য	কখনো কখনো সত্য	প্রায়ই সত্য	সর্বসময় সত্য
3.2 কর্মক্ষেত্রে ব্যবস্থাপনা					
3.2.1 কারখানা শ্রমিকদের স্বাস্থ্য সচেতনতা এবং/অথবা জীবন দক্ষতা বৃদ্ধির জন্য সুযোগ প্রদান করে এবং, বিনামূল্যে চলমান ভিত্তিতে চিকিৎসাসেবা প্রদান করে.	☐	☐	☐	☐	☐
3.2.2 সকল ঝুঁকিপূর্ণ মেশিনে যথাযথ নিরাপত্তা ব্যবস্থা এবং জরুরি স্টপ সুইচ বিদ্যমান, এইসব মেশিনে কর্মরত কর্মীদের PPE এবং নিরাপত্তা প্রশিক্ষণ দেয়া হয়।	☐	☐	☐	☐	☐
3.2.3 এই কারখানার সরকারের বিল্ডিং তৈরি কর্তৃপক্ষ থেকে অনুমোদিত এবং সার্টিফিকেট এ উল্লেখিত ফ্লোর এর সমান সংখ্যক ফ্লোর বিদ্যমান উপরন্ত, কারখানার সর্বত্র বৈদ্যুতিক তার (wiring) স্থানীয় নীতিমালার সঙ্গে সম্পূর্ণ সঙ্গতিপূর্ণ	☐	☐	☐	☐	☐
3.2.4 কারখানার স্বাস্থ্য সচেতনতামূলক কর্মসূচি, ঝুঁকিপূর্ণ মেশিন অপারেশন প্রশিক্ষণ ও ফায়ার ড্রিল নীতি পরিষ্কারভাবে উল্লেখ রয়েছে	☐	☐	☐	☐	☐
3.2.5 কারখানার ভবন, ভিতরে এবং বাইরের প্রাচীরের তাক, বৈদ্যুতিক তার (wiring), ফায়ার এক্সিট এবং অ্যাসেম্বলি পয়েন্ট পরিদর্শন নীতি রয়েছে.	☐	☐	☐	☐	☐
3.2.6 প্রতিটি প্রোডাকশন ও ডরমিটরি ফ্লোরে কমপক্ষে ২টি আনলক প্রস্থান (exits) রয়েছে.	☐	☐	☐	☐	☐

	কখনো সত্য নয়	কদাচিৎ সত্য	কখনো কখনো সত্য	প্রায়ই সত্য	সর্বসময় সত্য
3.3 স্টেকহোল্ডারদের সংশ্লিষ্টতা এবং কমিউনিটি প্রভাব					
3.3.1 কর্মক্ষেত্রের উন্নয়নের এবং উদ্বেগের বিষয় মোকাবেলা করার জন্য বিভিন্ন আঞ্চলিক ও আন্তর্জাতিক স্টেকহোল্ডারদের সঙ্গে সমন্বয়ের নীতিমালা এই কারখানার আছে	☐	☐	☐	☐	☐
3.3.2 ভ্যালু চেইনের ঝুঁকি এবং চ্যালেঞ্জ মোকাবেলার জন্য এই কারখানা মাল্টি-স্টেকহোল্ডার অথবা ইন্ডাস্ট্রি ফোরামে অংশগ্রহণ করে	☐	☐	☐	☐	☐
3.3.3 কারখানা স্থানীয় এবং জেলা পর্যায়ের ট্রেড ইউনিয়ন গুলোর সাথে (সরাসরি বা শিল্প বাণিজ্য সমিতি বা ত্রিপক্ষীয় উদ্যোগ মাধ্যমে) বিভিন্ন সমস্যা সমাধানের জন্য সমন্বয় সাধন করে।	☐	☐	☐	☐	☐
3.3.4 কারখানা স্থানীয় / আঞ্চলিক / আন্তর্জাতিক স্টেকহোল্ডারদের সঙ্গে একযোগে কর্মপরিবেশের উন্নয়নে কাজ করে	☐	☐	☐	☐	☐
3.3.5 কারখানা গত ১২ মাসের মধ্যে একটি কমিনিটি সার্ভিস স্পন্সর করেছেন	☐	☐	☐	☐	☐
3.3.6 কারখানা দাতব্য সংগঠন বা প্রকল্পে(অলাভজনক / বেসরকারী) নিয়মিত অনুদান প্রদান করে থাকে	☐	☐	☐	☐	☐
3.3.7 কারখানা উদ্ভাবনী কমিউনিটি প্রকল্প গ্রহণ করেছে যা শ্রমিক ও তাদের পরিবারের জীবন যাত্রার মানোন্নয়ন ঘটাবে	☐	☐	☐	☐	☐

		কখনো সত্য নয়	কদাচিৎ সত্য	কখনো কখনো সত্য	প্রায়ই সত্য	সবসময় সত্য
3.3.8	কারখানার নিয়মিত দান, কর্মচারী উন্নয়ন এবং তাদের পরিবারের সদস্য ও স্থানীয় সম্প্রদায়ের সদস্যদের জীবন যাত্রার মানোন্নয়নের লক্ষে কমিউনিটি সার্ভিস দেয়ার নীতিমালা রয়েছে	☐	☐	☐	☐	☐

আপনার সাহায্য ও এই গবেষণায় অবদানের জন্য আপনাকে ধন্যবাদ. যদি আপনার কোন প্রশ্ন কিংবা পরামর্শ থাকে তাহলে অনুগ্রহ আমার সাথে যোগাযোগ করুন

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APPENDIX C

EXPLORATORY FACTOR ANALYSIS

EFA: Economic Dimension

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.894
Bartlett's Test of Sphericity	Approx. Chi-Square	1572.909
	Df	105
	Sig.	.000

Rotated Component Matrix[a]

	Component			
	1	2	3	4
RCM1	**.668**	.442	.307	.212
RCM2	**.614**	.266	.377	.221
RCM3	**.715**	.241	.368	.245
RCM5	.299	.120	.627	.030
RCM6	**.593**	.423	.208	-.019
Com1	**.735**	.109	.287	.185
Com3	.240	-.132	-.036	**.833**
Com6	**.615**	.172	.375	.093
SCM2	.313	**.542**	.371	.000
SCM3	.083	**.761**	.190	-.050
SCM4	-.122	.186	.265	**.747**
SCM5	.437	**.583**	-.252	.337
FP4	.235	.088	**.747**	.235
FP5	.161	**.597**	.153	.402
FP6	.099	.488	**.558**	.186

Extraction Method: Principal Component Analysis.
 Rotation Method: Equamax with Kaiser Normalization.
 a. Rotation converged in 12 iterations.

EFA: Environmental Dimension

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.803
Bartlett's Test of Sphericity	Approx. Chi-Square	1418.569
	Df	136
	Sig.	.000

Rotated Component Matrix[a]

	Component				
	1	2	3	4	5
EMS1	**.682**	.251	.308	.155	.146
EMS2	**.759**	.013	.262	.059	.060
EMS3	.152	.162	.069	**.747**	-.327
EMS4	**.700**	.023	.023	.041	-.060
EMS5	.199	**.688**	-.061	.096	-.237
EMS6	.126	.254	.013	**.747**	.116
Wst1	**.763**	.052	-.050	.074	.080
Wst2	**.762**	.093	.249	.053	.050
Wst3	.121	**.625**	.097	.458	.143
Wst4	.592	.076	.011	-.078	.029
Wst5	.132	**.790**	.085	.265	.121
Wst6	.089	**.805**	.024	-.084	-.027
Eng1	.138	.059	**.880**	-.006	.049
Eng2	.341	.034	**.808**	-.017	.089
Eng3	.114	.109	.149	-.355	**.780**
Eng4	.251	.002	**.599**	.081	-.002
Eng6	.334	-.158	.037	.224	**.746**

Extraction Method: Principal Component Analysis.
Rotation Method: Quartimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

EFA: Social Dimension

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.833
Bartlett's Test of Sphericity	Approx. Chi-Square	2464.858
	Df	153
	Sig.	.000

Rotated Component Matrix[a]

	Component			
	1	2	3	4
Lbr1	**.835**	.030	-.026	-.008
Lbr3	**.891**	.041	.017	.012
Lbr5	**.854**	.086	-.024	.008
Lbr6	.202	.441	.004	**.618**
Stak1	**.805**	.089	.090	-.034
Stak2	**.820**	.031	.072	.063
Stak3	**.835**	-.013	-.015	.049
Stak4	.111	**.854**	.204	-.101
Stak5	.094	**.894**	-.148	-.005
Stak6	.053	**.689**	-.189	.480
Stak7	.646	.035	-.063	-.093
Stak8	.082	**.828**	-.322	-.058
WP1	.609	-.038	.086	.227
WP2	.212	-.020	**.791**	.181
WP3	.104	-.164	.296	**.757**
WP4	.703	.025	.149	.002
WP5	.088	-.200	**.736**	.255
WP6	.048	-.100	**.815**	-.178

Extraction Method: Principal Component Analysis.
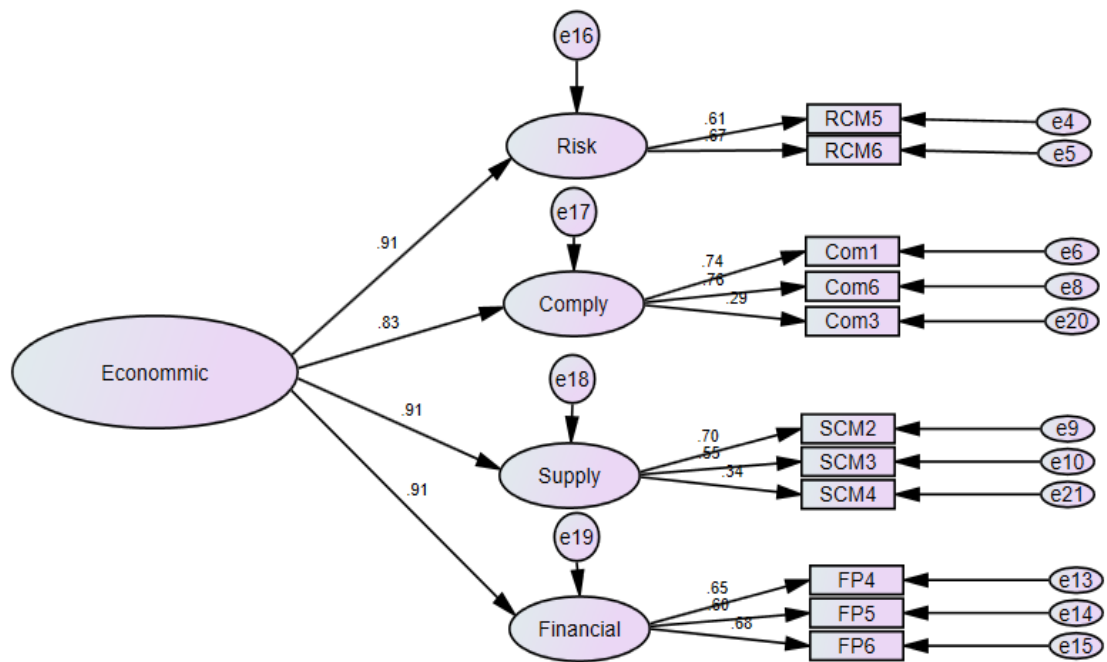 Rotation Method: Quartimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

APPENDIX D

CONFIRMATORY FACTOR ANALYSIS OF DIMENSIONS

CFA: Economic Dimension

CMN/df	RMR	RMSEA	CFI	TLI	GFI	AGFI	NFI	IFI	PNFI
2.386	0.037	.076	0.915	0.883	0.931	0.885	0.864	0.917	0.629

CFA: Social Dimension

CMN/df	RMR	RMSEA	CFI	TLI	GFI	AGFI	NFI	IFI	PNFI
2.617	0.030	.083	0.968	0.950	0.944	0.893	0.949	0.968	0.612
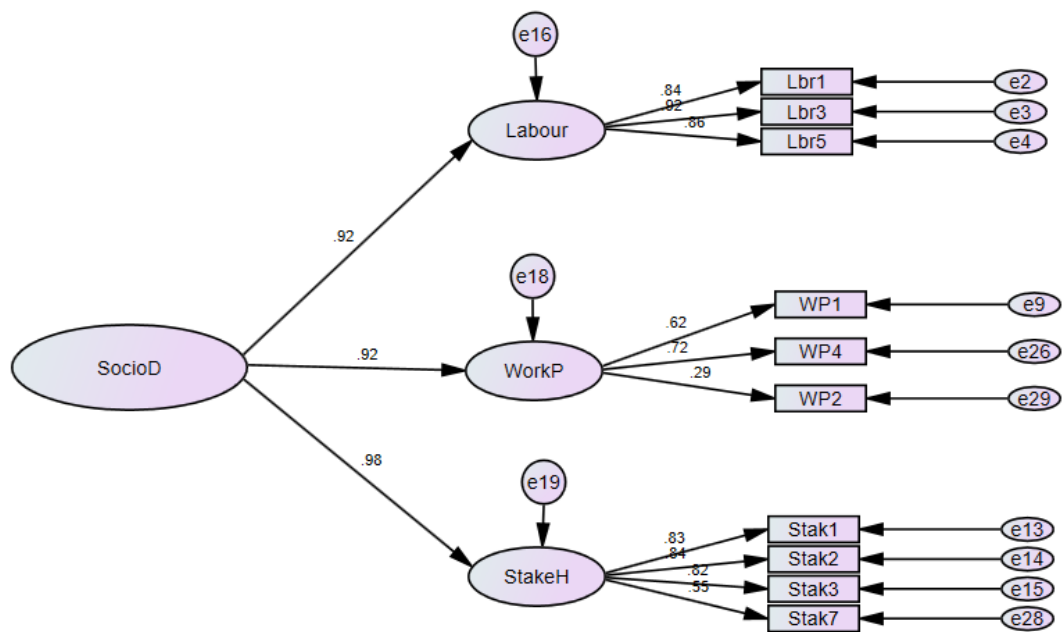
CFA: Environmental Dimension

CMN/df	RMR	RMSEA	CFI	TLI	GFI	AGFI	NFI	IFI	PNFI
2.361	0.072	.076	0.959	0.939	0.954	0.915	0.932	0.960	0.622
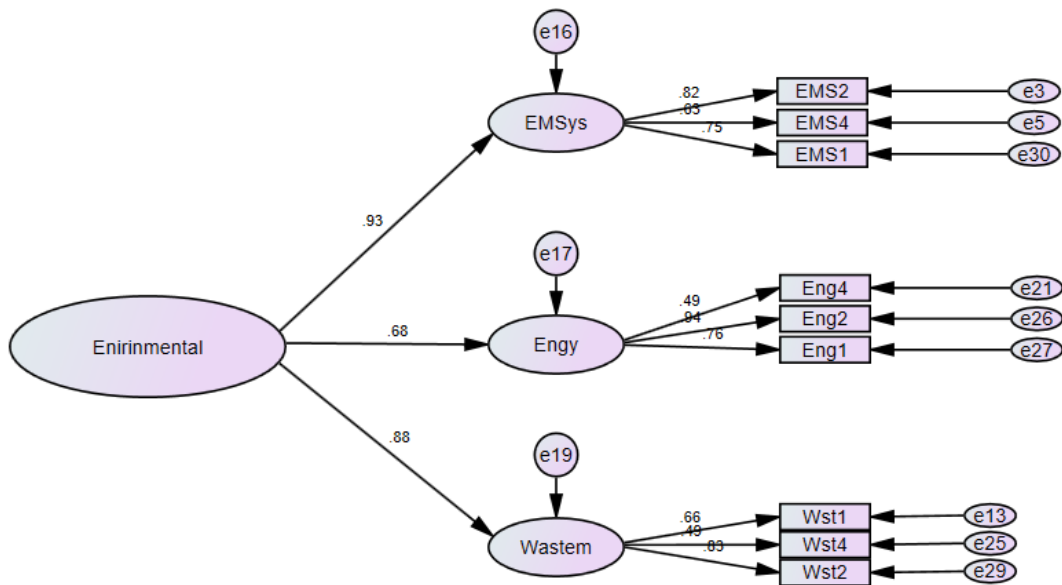
BIOGRAPHY

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