

COST BENEFIT ANALYSIS OF RMG COMPLIANCE TO INCREASING PRESENCE OF READY MADE GARMENTS (RMG) AND NEW SPECIALIZED RMG INDUSTRY ZONE

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Benefits and Costs of Building an Industrial Zone for RMG and Ensuring Compliance of all Factories in Bangladesh



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Cost Benefit Analysis of RMG Compliance to Increasing Presence of Ready Made Garments (RMG) and New Specialized RMG Industry Zone

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Abstract

In terms of export earnings, employment generation, poverty alleviation and empowering women, the readymade garment industry plays a vital role in Bangladesh's economy. In order to achieve sustainable growth and to register 50 billion USD in exports in 2021, it will be crucial to ensure industry-wide compliance and increase supply side capacity of the sector. This paper critically assesses the cost-benefit viability of two interventions, namely 'better compliance' and establishment of separate garments zone ('Garments Palli'). The results indicate that both of these interventions would be highly beneficial for the sector and country. From the sensitivity analysis, it is found that the median BCR for the compliance intervention is 14.4; while for 'Garments Palli,' the intervention it is 8.4. This study has also estimated the initial investment requirement for ensuring industry-wide compliance would be in the range of 2.1 billion to 3.0 billion USD which would increase the total exports by at least 10 percent.

Keyword: Bangladesh, RMG, Compliances, RMG Palli/Zone, BCR.

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Introduction

Bangladesh is progressively becoming an industrialized country. The current share of the industrial sector in its gross domestic product (GDP) is 30.4%, while the agricultural sector comprises only 16% of GDP (BER 2015). The contribution of industrial sectors in GDP is further expected to increase by 5% over the next five years, in which the manufacturing sector will play a leading role in contributing one-third of the GDP (Table A1, Appendix). It is important to note that the manufacturing sector of Bangladesh is dominated largely by the Ready-Made Garments (RMG) industry. RMG remain the single largest source of export earnings by backing more than three-fourths (84.5%) of total earnings, while absorbing the most of the manufacturing jobs in the country. At present, 4 million employees (of which 80% are women) are engaged in this sector. Hence, any planning for future industrialization and avenue for pro-poor growth projection of the country essentially demands further acceleration of this sub-sector with renewed strategic development.

It is expected that the demand for RMG, both locally and globally, will increase in the coming years. The size of the global textile and apparel market is projected to increase from 1.1 trillion USD in 2012 to 2.1 trillion USD by 2025 with a compound annual growth rate (CAGR) of 5%, with forecasted CAGRs for Indian, Chinese and Russian demand as 12, 10 and 8 per cent respectively over the same period (Wazir Management Consultants, 2012).¹ The report further estimated that the slowdown in Chinese exports would create a vacuum of more than 100 billion USD by 2025. This legroom will bring opportunities for competing exporting nations like India, Bangladesh, Pakistan, Vietnam, etc. The McKinsey study² on Bangladesh's RMG reported that US based fashion companies are going to source their imports heavily from Bangladesh in the near future and predicted that from the current level of 25 billion USD, the export of apparel items will increase by almost two-folds to reach at 46 billion USD in the next five years (2020) (Table A2, Appendix). Policy makers and industry experts have also echoed the similar expectation to reach the 50 billion USD target in RMG exports by 2021.³

For Bangladesh, realising these potentials and opportunities requires sustainable growth of the industry and addressing major problems such as a lack of compliance, competitiveness, capacity utilization and extension, inadequate infrastructure and shortage of power. However, these requirements presumably need to be targeted and prioritised. Therefore, as a part of this prioritisation, this paper focuses on two significant issues (a) intervention related to ensure better compliances and (b) intervention related to capacity expansion by establishing special RMG zone (this

¹<http://www.wazir.in/pdfs/The%20Road%20to%202025%20-%20Wazir%20Advisors.pdf>

² https://www.mckinsey.de/sites/mck_files/files/2011_McKinsey_Bangladesh.pdf

³ <http://www.dhakatribune.com/business/2015/may/04/bangladeshs-50bn-rmg-export-target-2021>

study will particularly focus on the proposed *RMG palli* in Munshiganj). Findings from these interventions are expected to provide policy leverage, both to the government and the entrepreneurs with an aim to ensure sustainability of this sector.

Although Bangladesh has made good progress on a number of compliance issues such as addressing long working hours and the elimination of child labour, the RMG sector has registered a wakeup call for ensuring compliance, particularly related to structural soundness and fire safety. This was evidenced by the two large industrial catastrophes, namely, the Tazreen Fashion fire in 2012 and the Rana Plaza disaster in 2013. Ensuring compliance (and inspection) has become a prerequisite for exporting RMG products from Bangladesh⁴. It is an established fact that non-compliance would have a major negative impact on exports. There are several incidents of order cancellations and subsequent lower orders from the retailers due to non-compliance.⁵ In addition, Bangladesh's RMG sector registered negative branding and an image crisis in the global market, particularly due to non-compliance of workers' safety. It is of paramount importance to address compliance related issues such as improving workplace safety for all, improving health facilities, regularity in payments for those in the RMG industry. These initiatives are expected to have significant impact on increased productivity and maintaining competitiveness of the industry. Hence, the competitiveness of the industry now very much depends on ensuring compliance from the short to medium term perspective.

Soon after the Rana-Plaza incident, retailers and international organisations, along with the government of Bangladesh, initiated various modalities of ensuring compliances. The improvement of fire safety and security at the workplace was chief among them. Consequently, despite the fact that these tragic incidents jeopardised the future prospects of the RMG industry, safety initiatives from sourcing countries and many international organizations have assuaged some of the challenges regarding the working conditions, making it the "next hot spot" in apparel sourcing. Recently (in 2015), Swedish retail giant H&M has decided to double its business to 3 billion USD⁶ in Bangladesh over the next five years.

This move by the global giant, that sources its materials from some 250 factories in Bangladesh, shows the growing confidence, proliferation and concentration of foreign buyers in the Bangladesh RMG industry. However, to keep up the momentum, the sustainable growth of the RMG industry in

⁴ Deussom and Adams (2012), Robertson et al. (2011), Carter (2010), Asuyama et al. (2013),

⁵ <http://mhssn.igc.org/Chowdhury,%20Tanim%20-%20AJSSMS%202016.pdf>

⁶ <http://www.textiletoday.com.bd/enzyme-assisted-eco-friendly-green-textile-processing-2/>

Bangladesh has to maintain the series of compliance parameters set by the national body⁷ and global players such as Bangladesh Accord (see Box 2 in Section 3), Alliance for Bangladesh Worker Safety⁸ and the ILO⁹.

While compliance is targeted for the existing factories to be able to compete globally, the need for the RMG industry clusters to facilitate establishing new factories and relocating the unplanned and/or noncompliant factories, particularly from the city milieu, is also gaining in importance. Since the 1980s, Bangladesh has experience in setting up special economic zones through the establishment of EPZ¹⁰. Recognising the importance of a separate RMG zone, the Government and the Bangladesh Garments Manufacturers and Exporters Association (BGMEA) have taken the initiative to establish an exclusive RMG *Palli* (RMG industrial park) on 530.78 acres of land at Gazaria of Munshiganj district under Dhaka division, which is about 40 kilometers from the center of the capital. The specialized industrial park is expected to be equipped with developed infrastructure that would be characterized by a modern and purpose-built factory – secured power, energy and other utility services, better transport system for the workers, administrative benefits, better management and amenities for workers. As a matter of fact, both interventions under consideration of this study are closely related; as one of the objectives of new RMG *Palli* is to ensure better compliance, particularly those that relate to structural, electrical, environmental and fire safety. The establishment of the RMG *Palli* is based on three key motivating factors; (1) relocation and ensuring compliance of the first generation factories, i.e., factories that were established in an unplanned manner, often operating in small buildings in urban areas and suffer from critical noncompliance, (2) to make this industry sustainable in the long run (in particular for the fulfillment of the 50 billion USD target by 2021 and there will be no such repetition of tragic incidents like the Rana plaza disaster), and (3) to enhance the export and other associated benefit to the workers in general and for the country in particular.

These twin interventions, namely, ensuring compliance and the establishment of a separate RMZ zone (RMG *Palli*) will not only boost the export and competitiveness of the sector but could also create a workforce conducive to the vehicle for the pro-poor growth. Given this background, to set the priorities for this sector, a comprehensive cost-benefit analysis (CBA) will be supportive in guiding both policy makers and stakeholders to decide on their investment priorities and financial need on those areas. This

⁷ The Government of Bangladesh and representatives of Bangladesh employers' and workers' organizations have signed an integrated National Tripartite Plan of Action (NTPA) on Fire Safety and Structural Integrity in the garment Sector of Bangladesh).

⁸ An initiative from a group of North American apparel companies and retailers and brands.

⁹ Improving Working Conditions in the Ready-Made Garment Sector' program.

¹⁰ EPZ began to operate in 1983 through the BEPZA Act (Act no. XXXVI of 1980) under the auspices of the Prime Minister's Office. Bangladesh currently has eight EPZs in which around 138,341 workers are employed (BEPZA, 2013).

paper, therefore, is based on available information and has made an attempt to quantify the cost and benefits of ensuring compliance and establishing a separate zone for RMG. The rest of the paper is organized in the following manner: Section 2 briefly discusses the methodological issues relevant to this study; Section 3 and Section 4 articulate the two interventions with a particular focus on the cost benefit analysis. Section 5 outlines other associated benefits of the RMG sector while Section 6 concludes with relevant policy directions.

Methodological issues

The standard methodology that is widely used in the literature for estimating the net benefits of an intervention is- net present value (NPV), the benefit-cost ratio (BCR) and internal rate of return (IRR). In this paper, we will use the BCR and IRR to quantify the net benefits of the interventions under consideration.

BCR is a relative measure that is used to evaluate the payoff of any investment. This measure is calculated by dividing total discounted benefits by the total discounted costs as shown in (1).

$$BCR = \frac{\left(\sum_{t=0}^T \frac{B_t}{(1+\delta)^t}\right)}{\sum_{t=0}^T \frac{C_t}{(1+\delta)^t}} \quad (1)$$

where, B_t is additional benefits because of the specific intervention in year t ; C_t is the additional cost associated with intervention in year t , and δ is the discount rate. Various discount rates have been applied for checking the sensitivity analysis of all results.

The internal rate of return is an alternative measure for evaluating the payoff of investments, which has been widely used in the investment literature. The IRR is the rate at which discounted benefits are equal to the discounted cost of investment. In other words, the IRR is the rate of return that would set Net Present Value (NPV) equals zero, as shown in equation (2).

$$0 = \sum_{t=0}^T \frac{B_t - C_t}{(1 + IRR)^t} + \frac{B_{T+1}}{IRR} \left(\frac{1}{(1 + IRR)^{T+1}} \right) \quad (2)$$

For the cost-benefit analysis of the proposed interventions, we have extensively used secondary literature and information. Along with secondary sources of information, we have performed a number of Key Informant Interviews (KII) and Group Discussions (GDs) with the business association leaders and experts to gather and validate information and findings related to this topic. A small field survey, both in terms of coverage and sample size (involving ten RMG factories), has also been conducted to obtain information of various relevant indicators. Due to time and resource constraints, the survey design used a convenience sampling method. However, a conscious effort has been made to ensure representation of RMG factories in terms of factory size, compliance status and production type (i.e., woven garments and knitwear). To obtain the industry perspective, where possible, the underpinning assumptions and calculations that were used to estimate the BCRs (mentioned later) are discussed and validated with the industry people.

For both the interventions, the benefits are captured by the increase in export earnings due to the intervention. In case of the *Palli*¹¹ intervention, after estimating the extra number of RMG units due to the intervention with respect to a counterfactual number of new RMG units in the next three years, we have used both the national and Palli average exports per figure (using feasibility report information¹²) to estimate the export benefits. Whereas for the compliance intervention, in the absence of any useable data, using the information from KII, GD and field survey, we arrived at an estimate of exports benefits; i.e., at least 10 percent of the total exports would be attributed as benefits of ensuring industry-wide compliance. An estimate of loss in income due to deaths from noncompliance related accidents using the Disability Adjusted Life Years (DALY) method has been provided and added to the benefit side for compliance intervention.

On the costs side, for the Palli intervention we have used the information available in the feasibility report which provides only an aggregate figure without any breakdown. We have also provided an estimate of the current average costs to establish a RMG unit using our field survey data to create a scenario for sensitivity analysis. The estimated establishment costs from the field survey and the benefits estimated by using the national per factory average export constitute the benchmark scenario for the Palli intervention. While in the absence of any systematic study on the compliance related costs, we relied on the information published in the local and international print media which has been substantiated through KII, GD and the field survey. In this paper, we have used that average per factory compliance related investment requirement lies between 0.50 million and 0.70 million USD. This implies an initial fixed term investment of 2.1 billion – 3.0 billion USD would be required to ensure industry-wide compliance in Bangladesh. We have also considered yearly running costs for both of these interventions.

The details of the conceptual framework for estimating the BCRs are discussed in Section 3 and Section 4 respectively. A review of literature on the associated social benefits due to the presence and expansion of the RMG has been presented in Section 5.

¹¹ RMG Palli will often be referred as a Palli only in this paper.

¹² Despite our best effort to collect the feasibility study on this project, unfortunately we were able to collect only the executive summary of the report. This restricted us to examine the cost (or expected benefit) components and their respective estimates in details, along with the underlying assumption set used in the estimation.

Benefits and cost analysis of ensuring compliance in the garments sector of Bangladesh

3a. Introduction

In many organizational setups, necessary health and safety management practices are considered as preconditions of global safety culture.¹³ Previous studies of different countries under a wide variety of settings provide evidence of a positive relationship of safe and healthy working conditions with productivity, work performance, employee satisfaction and minimizing hazards and risks of accidents.¹⁴ Compliance is one of the most important issues to ensure the competitiveness and sustainable growth of the RMG industry.¹⁵ The Rana Plaza tragedy has once again drawn the attention of citizens of the country to the dismal state of many export-oriented RMG factories in Bangladesh, in which workers are subjected to work day in, day out. Despite the significant progress of Bangladesh's RMG sector over the last three decades, the state of physical and social compliance, particularly concerning workplace safety and security, has failed to match the growth of the sector. A large number of factories are continuing to work amid poor physical and social compliance. Over the past 10 years more than 2,000 workers have died in fire incidents in the RMG sector of the country. A large number of factories continue to enjoy impunity despite having the laws, regulations and labour law provisions in place (CPD, 2013). Consequently, following the recent catastrophic accidents, buyers are putting increasing importance on compliance standards as the concerned authorities of the importing countries are becoming more apprehensive about the work and social environment in the sourcing factories of Bangladesh (Moazzem, 2008). The RMG sector in Bangladesh, from its early stage is governed through a 'soft look' policy; e.g., entrepreneurs were allowed to establish factories in residential premises leading to an unplanned growth with noncompliance as a common feature. Consequently, ensuring necessary compliance measures has been a burning issue for RMG communities from the very beginning. The first generation compliance measures address the basic labour rights; while the second generation compliance measures consist of the Occupational Health & Safety (OHS). The current and third generation compliance measures bring all issues, including the factory structural safety, OHS and ensuring labour rights. Past experiences show that whilst some tangible progress tends to be made after each disaster, many of the proclaimed steps remain unaddressed. As a result, similar accidents keep on happening, leading to the announcement of a flurry of actions when the next disaster strikes. Therefore, the application of compliance (particularly

¹³ See for example, Arboleda *et al.*, 2003; Vredenburg, 2002; Vassie and Lucas, 2001; and McDonald *et al.*, 2000.

¹⁴ See, for example, Deussom and Adams, 2012; Harvey and Gavigan 2014, Barrientos *et al.*, 2005 Robertson *et al.*, 2011; Carter, 2010; Hori 2012; Saifullah & Ismail 2012; Noweir *et al.* 2013; Morillas *et al.*, 2013; Geldart *et al.*, 2010.

¹⁵ S. Rajon, Total compliance in RMG key to global market access, The Financial Express (2014) 26 November 2014, Available at: <http://www.thefinancialexpress-bd.com/2014/11/26/67890>

third generation) in the RMG sector can be ensured by maintaining some strict standards, from factory building to operations and maintenance. This includes factory structure, working condition, electrical and fire safety, various rights of workers, workers' health and environmental safety measures, etc.

Benefits of ensuring compliance have been articulated by a number of scholars. Buhai et al. (2015) estimated a standard production function employing Danish longitudinal matched employer-employee data combined with a unique cross-sectional representative firm survey data on work environment conditions; and studied the causal impact of workplace health and safety practices on firm performance. They found significant positive impact of removing problems related to internal climate (7%) and monotonous repetitive work (9%) on productivity. Harvey and Gavigan (2004) estimated that Canada incurs \$51 billion economic costs annually for productivity loss due to increasing workplace stress and other related issues. Dwomoh et al. (2013) reported a positive correlation (Pearson correlation, $r=0.42$) between investment in health and safety and employees performance and an inverse relationship between employees performance and reducing workplace injuries through health and safety measures. Esi (2012) conducted a case study on Ghana Rubber Estates Limited and reported that 87.5% respondents (employees) opined that health and safety standard affects productivity. De Greef and Van den Broek (2004) suggested that the quality of a working environment has a strong influence on productivity and profitability and poor OSH performance may lead to a competitive disadvantage damaging the firm's status among stakeholders. This is a motivating factor to company management to invest in OSH. Yrjänheikki (2011) reported that an investment of 1 euro in wellbeing at work produces 3- 7 euros return.

Berik and Rodgers (2008) studied labour standards enforcement and compliance in Bangladesh and Cambodia. Their analysis indicate that low wages, unsafe, and unhealthy working conditions have persisted in Bangladesh, while necessary compliance measures has begun to improve in Cambodia following a trade agreement with the United States that linked positive trade incentives with labour standards enforcement. From this experience they concluded that in less developed countries, governments should consider providing incentives to achieve improvements in working conditions without hindering export growth. Asuyama et al. (2013) while analysing the Cambodian RMG factories, revealed that employees' work performances have improved in Cambodian RMG factories due to increasing maintenance of compliance practices. Nur (2013) and Ahmed (2012) identified that the lack of sufficient space in RMG factories made it difficult to apply the OHS measures in Bangladesh. Sarker and Afroze (2014) conducted a study on Bangladeshi RMG factories to examine the (linear) relationship among financial, non-financial HRM practices and job satisfaction of RMG workers and

reported that significant positive relationship i.e., financial and non-financial activity has around 70% and 80% influence on the job satisfaction, respectively. BILS (2005), Akram (2014), Ahmed and Hossain (2009) argued that it is possible to achieve higher worker productivity, satisfaction, retention rate and wellbeing in the RMG factories of Bangladesh through maintaining a standard work environment. The strict application of the Code of Conduct (CoC¹⁶) of a global supply chain, and regular practice of OHS measures and compliance can result in high worker morality and productivity with low labour unrest (Rahman and Hossain, 2010). The working environment is important towards achieving the objectives of social compliance issues (Das 2008). So, academic discussions on the benefits of compliance range from improving working conditions, addressing health hazards, ensuring job satisfactions and minimising labour unrest.

From the entrepreneurs' perspective, a compliant factory can have number of benefits over an non-compliant factory such as higher price, free from labour unrest (means will have better labour-management relations), low worker turnover, global image and recognition (branding) which increases the profitability of the factory by securing a constant flow of orders from reputed buyers and increased productivity (Baral, 2010). However, this study is quite dated (mostly addressed the second generation compliance) and does not cover the issue of industry wide cost-benefit analysis of compliance. However, findings from this study (in box-1) provide a general basis to understand the evidential benefits of ensuring compliance over the non-compliance one.

Box 1: Economic Benefits of compliance

- For compliant factories, on an average, turnover rate to initial investment is 334.04%.
- For Non-Compliant Factories, on average, turnover rate to initial investment is 247.72%.
- Better compliance results in 86.32 % higher turnover rate to initial investment.
- The difference in initial investment between compliant and non-compliant factories is about USD 0.16 million.
- For the same investment both for compliant and non-compliant factories, which is 0.283921 million US\$, the average annual turnover of compliant factories is 0.2451 million US\$ higher than the non-compliant factories.

Source: (**Baral, 2010**)

3.b. Third Generation Compliance in Bangladesh RMG

A diverse range of actions have been undertaken as part of the reform and restructuring of the Bangladesh RMG sector following the Rana Plaza Tragedy. These actions have been carried out under

¹⁶ General codes of conduct (CoCs) are usually voluntary and developed using a multistakeholder approach. SA8000, ETI, WRAP, BSCI, FWF and FLA are some of the prevailing general CoCs. http://www.psesbd.org/index.php/publications/factsheets/item/download/18_5ff08431296e2416295eaf2915dbe3e5. [accessed on March 23, 2016]

initiatives including, but not limited to, The Accord, Alliance and the National Tripartite Action Plan (NTPA). The combined initiatives of Accord, Alliance, and NTPA to ensure proper measures of compliance in the RMG factories of Bangladesh are considered unique in the context of the global RMG sector.

To address compliance issues with due international rigor, two alliances of international buyers - Accord on Fire and Building Safety (Accord) and Alliance for Bangladesh Workers Safety (Alliance) – have undertaken the responsibility to assess Bangladesh RMG factory buildings in terms of structural integrity, fire and electrical safety. The Accord closely monitors the progress made by the Accord signatories and factories with frequent recommendations for further development. An overview of the Accord’s operation measures and performance is given in the following Box (see Box-2).

The Alliance has arranged low-cost financing for factory owners in order to support them in implementing remedial actions. In addition, the Alliance has provided its workers with basic fire safety training. According to Second Annual Report (2015)¹⁷ published by the Alliance, a total 790 factories are included in the Alliance process. Up to September 2015, Alliance inspected 661 factories and approved corrective action plans (CAPs) for 591 factories. A total 22 factories (8 fully closed, 12 partially closed, and 2 load reduction) were sent to the review panel. The total number of workers in Alliance factories is estimated to be 1.2 million. Amongst these 1.2 million workers, 93% were trained for fire safety.

Immediately after the Rana Plaza incident in 2013, it became inevitable for the Government of Bangladesh to initiate a set of strict regulations for building and fire safety. In line with this concern, National Tripartite Action Plan (NTAP) was adopted to bring all RMG factories in Bangladesh under the scanner of its assessment scheme. The NTPA, with the support of the ILO, has set a target to inspect around 1,500 factories that are neither part of the Accord or the Alliance. This programme is supported by Canada, the Netherlands and the United Kingdom. To implement NTAP’s assessment instruments (structural integrity, fire and electrical safety), Bangladesh University of Engineering and Technology (BUET) was given the responsibility to conduct building assessment with a target of assessing 1500 factories. As of 16th March 2016, a total of 1549 RMG factories have been inspected by BUET and all that 1549 factories have received their inspection reports. Out of 1549 factories, Department of Inspection for Factories and Establishments (DIFE) has received 300 corrective action

¹⁷<http://www.bangladeshworkersafety.org/files/Alliance%20Second%20Annual%20Report.%20Sept.%202015.pdf>

plans (CAP) with some error and resent for further correction.¹⁸ To date, DIFE approved 5 CAPs for the implementation. According to DIFE’s RMG sector Database, a total 150 factories were referred to Review Panel Actions. Amongst the 150 factories, 69 factories were allowed to operate with some recommendations, 42 factories located were partially closed, and 39 factories were completely closed¹⁹.

Box 2: The Accord

The Accord (**The Accord on Fire and Building Safety in Bangladesh**) is a five-year independent, legally binding agreement between global brands, retailers and trade unions designed to build a safe and healthy Bangladeshi Ready Made Garment Industry. The purpose of accord is to enable a working environment in their workplace in which no worker needs to fear fires, building collapses, or other accidents that could be prevented with reasonable health and safety measures. The Accord was signed on May 15th 2013.

The agreement consists of six key components:

A five-year legally binding agreement between brands and trade unions.

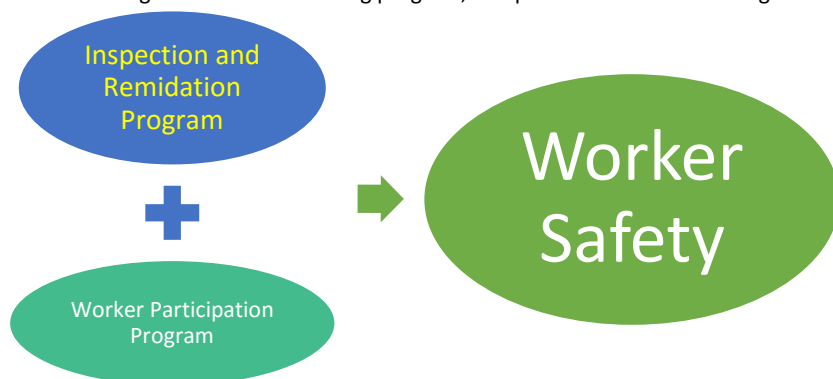
An independent inspection program supported by brands in which workers and trade unions are involved.

Public disclosure of all factories, inspection reports and corrective action plans (CAP)

A commitment by signatory brands to ensure that sufficient funds are available for remediation and to maintain sourcing relationships

Democratically elected health and safety committees in all factories to identify and act on health and safety risks.

Worker empowerment through an extensive training program, complaints mechanism and right to refuse unsafe work.



Governance and Current Situation. The Accord is governed by a Steering Committee with equal representation of the signatory companies and trade unions with a neutral Chair provided by the International Labour Organisation (ILO). As of February 2016, the Accord has covered 1,661 factories for inspections and CAP development. However, the Accord has actually inspected 1589 for fire, electrical and structural safety and published CAPs for 1416 factories. Amongst these 1661 factories, initial CAP were completed for only 2 factories, 58 CAP were on track, 1346 CAPs were behind schedule, 243 CAPs were not finalized, and 12 CAPs were not implemented.

It was reported that a total 103844 hazards were found of which 48029 are electrical, 35576 are fire and 20239 are structural hazards; and 28753 of these were corrected. According to the Accord, fixing all these hazards is a huge undertaking for the RMG industry, but safety remediation work in those factories is in progress. There has been especially good progress on electrical remediation, which is positive as most factory fires are caused by electrical hazards.

Less Participation of North American Firms. According to Washington Post (May 15, 2013), most U.S. clothing chains did not sign pact on Bangladesh factory reform in fear of the pact being legally binding, while their European counterparts signed.

Source: <http://bangladeshaccord.org/wp-content/uploads/Building-standard-August-12-2014-1.pdf> and <http://bangladeshaccord.org/progress/>

¹⁸ <http://database.dife.gov.bd/>

¹⁹ <http://database.dife.gov.bd/>

3.c. Loss due to death from noncompliance related accidents in the RMG industry

In this section, an estimate of the potential loss in income due to noncompliance related accidents in the RMG sector in Bangladesh has been presented during the period 2009-2014. The Disability-Adjusted Life-Year (DALY) is a metric that combines the burden of mortality and morbidity (non-fatal health problems) into a single number i.e. number of years lost due to ill-health, disability or early death²⁰. We have considered only the cost of deaths, whereas there are injuries of different forms and extents, which we could not quantify due to lack of information.

Table 1: Number of persons who have died due to accidents in the RMG industry

Year	Persons died (All incidents)	Number of persons died excluding major incidents
2009	7	7
2010	33	33
2011	4	4
2012	115 (111)	4
2013	1145 (1138)	7
2014	1	1

Source: <http://odhikar.org/>

Note: Figures in the parentheses represents death from Tazreen and Rana plaza accidents respectively

From the above table 1, it has been revealed that, during 2012 and 2013 a total of 1260 RMG workers died from different accidents at their work places. Most of these deaths were due to the tragic accidents happened in Tazreen and Rana Plaza. Life is priceless and it is not possible to evaluate the full loss due to these deaths. However using the widely used DALY methods in health economics along with the assumptions listed below, we have estimated the discounted loss in potential deaths.

Assumptions:

- 1) Value of death adjusted life year (DALY) = USD 1234.88 (provided by the CCC)
- 2) As the age structure of the workers is unknown, the following generalizations are made:
- 3) The age cohort of RMG workers in Bangladesh is 18-38 years (Source: KII, FGDs and field survey).
- 4) The average age of the workers died is the average of the age cohort of the RMG workers is $(18+38)/2=28$.

²⁰However, DALY is not an economic measure rather it measures how much healthy life is lost. It does not assign a monetary value to any person or condition, and it does not measure how much productive work or money is lost as a result of death and disease.

- 5) The average life expectancy at birth in Bangladesh is 72.6 years for women and 71.5 years for men (provided by the CCC).
- 6) Taking into consideration of the fact that 80% of garments workers are women, the average (undiscounted) years lost at time of death is 45 years. This gives the discounted DALYs as 24.3 years (3%), 17.7 years (5%) and 9.8 years (10%).
- 7) The discounted value of one life lost is calculated as USD 29,814 (3% discount rate), USD 21,814 (5% discount rate) and USD 12,164 (10% discount rate).
- 8) Finally, based on 6 yearly moving average of people died in the period in between 2009-2014, we have projected the value of DALY for next 20 years (2015-2034). We assume proper compliance eliminates all factory deaths.

Table 2: Discounted costs (Net present Value) due to deaths from accidents in the RMG industry from year 2009-2014 (Million USD)

Indicator	2009-2014 (actual)			2015-2034 (projected)		
	3%	5%	10%	3%	5%	10%
All incidents	38.41	27.97	15.60	130.72	79.46	29.97
Excluding major incidents	2.352	1.490	0.617	2.35	1.49	0.62
Rana Plaza and Tazreen	36.06	26.48	14.98	n/a	n/a	n/a
Per person	0.29	0.21	0.12	0.02	0.01	0.01

Source: Authors' estimation.

Table 2 indicates that in the last six years, depending on the discount rates used, a total of 15.60 million USD to 38.41 million USD was lost due to accidents (for non-fulfilment of different types compliance) Among these accidental deaths, most of them were concentrated on the two major events namely collapse of the Rana plaza and the fire on Tazreen Fashion. During the period 2009-2014, on average 6.4 million USD to 2.60 million USD in income was lost per year. Again, considering the trend of accidental deaths in the RMG industry for the next twenty years, we can get an estimate of potential loss ranging between 30 million and 131 million USD. Finally, since the loss in income due to accidental deaths can be prevented by ensuring better compliance, this can be considered as a potential benefit of ensuring compliance and we will consider this while estimating BCRs in the next section.

3.d. Direct (Export) Benefit Cost ratio

In this section, estimates of the BCRs, with a sensitivity analysis, of ensuring compliance are presented. We estimate the BCRs considering a time period of 20 years. We have used 3%, 5% and 10% discounting factor while estimating the BCRs.

To ensure the compliance status of a factory, it requires both a fixed initial investment to improve physical infrastructure (building, fire protection, etc.) and a running cost over the years to maintain the compliance. Unfortunately there is no study available that provides systematic, disaggregated and

reliable estimate of compliance related costs. It is also difficult because of the lack of uniform definition of compliance. However, there is some information available in the print media quoting some compliance costs figures with reference to industry people and experts. For example, *The Economist*²¹ and the ambassador of Bangladesh, Ismat Jahan, while addressing the European parliament international trade committee²² come up with an aggregate figure of 3 billion USD; i.e., on average 0.70 million USD per factory. The chamber leaders opined that it would require on average 0.50 million USD to ensure compliance in the sector.²³ Another report suggests that the average compliance costs for each factory would be in between 0.60 million and 1.0 million USD.²⁴ In our debriefing sessions and KII with the industry leaders and experts and our data from field survey, we found this average costs to be in between 0.50 million to 0.70 million USD. In this BCR analysis, we consider three average costs/factory; Case 1: 0.50 million USD, Case 2: 0.60 million USD/factory and Case 3: 0.70 million USD. This will give the total compliance investment requirements for the RMG industry as 2.1 billion, 2.6 billion and 3 billion USD for Case 1, Case 2 and Case 3 respectively. This initial investment will equally be spread over five years. The yearly running cost to maintain compliance status is assumed to be 10% of initial compliance investment.

Ensuring compliance in the industry will contribute to the economic gain for any industry by increasing productivity, lowering worker turn-over, reducing probability of accidents, giving price premium or retaining of existing buyers, and/or new buyers. One of the major consequences of non-compliance in the RMG industry is the creation of a dire impression among buyers which eventually leads to the lower level of orders and shifting orders to the competitors. This would adversely affect the overall industry and would result in a significant fall in export earnings. In other words, ensuring compliance would help us to maintain RMG export growths to achieve the targets over the coming year. From the field survey, KII and debriefing sessions with the industry expert, the benefits of ensuring compliance is suggested as an increase of at least 10% in total export values with at least a 5% increase in price and at least a 10% increase in volume.²⁵ To estimate the export benefits of this intervention, we consider a 10% increase in total export values. For this purpose, we have taken the projected exports

²¹<http://www.economist.com/news/business/21577078-after-dhaka-factory-collapse-foreign-clothing-firms-are-under-pressure-improve-working>

²² <http://www.clickittefaq.com/safe-factories-would-cost-us0-10-per-garment/>

²³ <http://www.dhakatribune.com/business/2013/sep/06/factory-safety-compliance-push-production-cost>

²⁴ <http://print.thefinancialexpress-bd.com/2015/08/16/104083>

²⁵ The increase in unit price could be significantly higher, if the ethical buying campaign can be strengthened and a more fair value chain can be ensured. In this respect, the commitment from buyers and monitoring the realization of these commitments are of paramount importance. It is also expected that the buyers will place more orders if the compliances can be ensured that would lead a significant rise in volume.

target for FY 2015 to FY 2020 from McKinsey (see Table A2 in Appendix). To project the total RMG exports for rest of the period starting from 2021, we have used two average annual growth rates: Scenario 1: a yearly growth rate of 13% (average of the McKinsey projection over FY2016-FY2020) and Scenario 2: a yearly growth rate of 8%. Scenario 2 is of course a conservative estimate as compared to the CAGR of 11.68% of RMG exports over the period FY2011-FY 2015. However, under both scenarios the export earnings will achieve the industry set target of USD 50 billion.

Table 3: Cost Benefit Analysis of RMG Compliance

	Scenario 1			Scenario 2		
Indicators	Case 1	Case 2	Case 3	Case 1	Case 2	Case 3
BCR (3%)	28.31	20.22	14.16	20.46	14.61	10.23
BCR (5%)	25.24	18.03	12.62	18.65	13.32	9.33
BCR (10%)	19.21	13.72	9.60	15.02	10.73	7.51

Source: Authors' estimation

From the above Table it is evident that investment in compliance would be highly beneficial and a priority to ensure sustainable growth of the sector. The BCRs, under all combination, are well above one with a median value of 14.4. Even the most conservative BCR estimates of this sensitivity analysis, i.e., with relatively higher compliance costs with lower export growths (Scenario 2, Case 3), lie between 7.5 and 10.2. Furthermore, from a very pessimistic point of view, if the effect of ensuring compliance measures is assumed to be a 3% increase in exports, instead of a 10% increase in exports, the median BCR across all scenarios stand at 4.3. The net present value of costs and benefits are given in Appendix Table A3.

The analysis and findings above show the benefits of transforming into compliance factories. It is often claimed by the entrepreneurs about the visible benefits of such compliance. This cost-benefit analysis will provide food for further thought for the financing mechanisms of the cost associated with this compliance. In fact, financing part has been a crucial in the current context. Due to many reasons, such as geographical factors and high investment requirement for ensuring compliance with the existing set-up, many small to medium scale factories are forced to relocate or close down their units. Hence, the discussion of RMG palli in the next section could shed light on this issue so that policymakers could determine the viability of this investment.

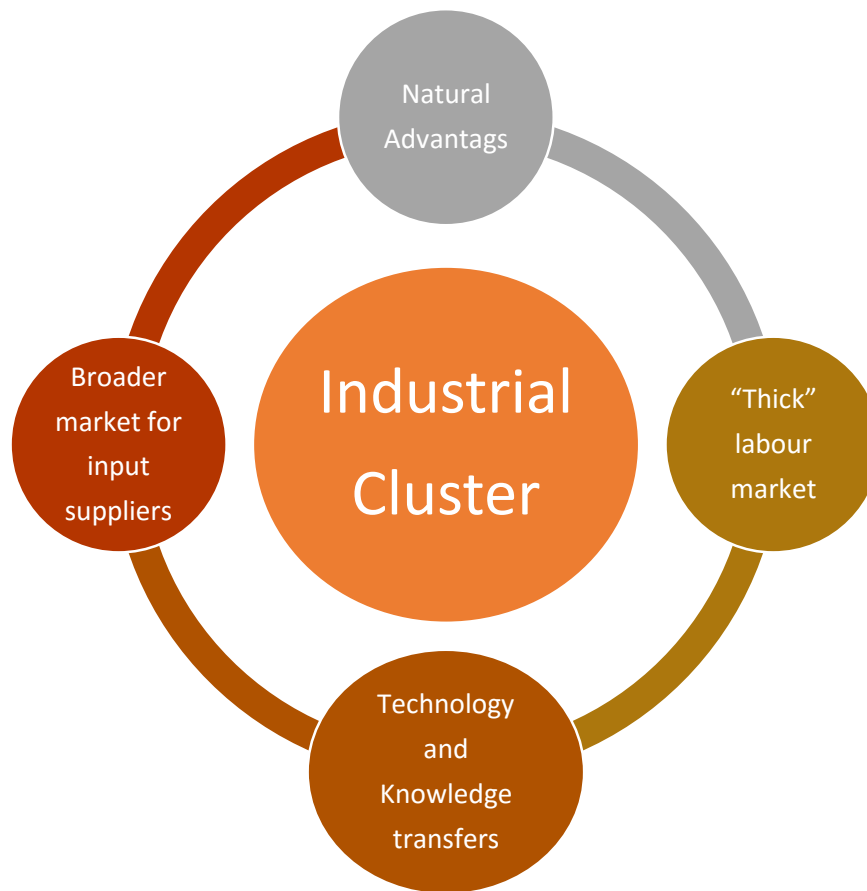
Cost-Benefit Analysis of Separate RMG Zone: The Case of 'RMG Palli'

4.a. Introduction

Over the past few years industry cluster, a non-random spatial concentration of economic activities (Ellison & Glaeser, 1997), has become an important economic development strategy in different developing and emerging economies, particularly for countries from the East and South-east Asian region.²⁶ The establishment of separate RMG zone is an example of industry cluster where several RMG units will be located in a certain geographical position to address the challenges that the sector is facing in order to achieve sustainable growth and export targets such as ensuring compliance, relocation of unplanned/noncompliant factories and expansion of the industry. This separate zone is also expected to reduce production costs and raising profits on the basis of well-developed facilities, similar and better technologies, ensuring pollutant free environment, better management practices, scope of easy diffusion and spill-over of technology and management know-how, skilled workers which are frequently linked by buyer-seller relationships. There is extensive literature, both theoretical and empirical, on the theoretical reasoning, types, advantages, disadvantages, case studies on industry cluster (see, for example, Ohlin, 1993; Karlsson, 2007; Krugman, 1979, 1980, 1981 & 1991; Porter, 1998; David & Mark, 1997, Waits et al, 1997 among others). The broad benefits of industrial clusters are presented in Figure 1.

²⁶ It was first introduced in Ireland in 1959 and developed in china after 1979. Now more than 130 countries have adopted the idea of special economic zone (Cheesman, 2012).

Figure 1: Broad Benefits of Industrial Clusters



Source: Institute for Strategy and Competitiveness at Harvard Business School, 2011

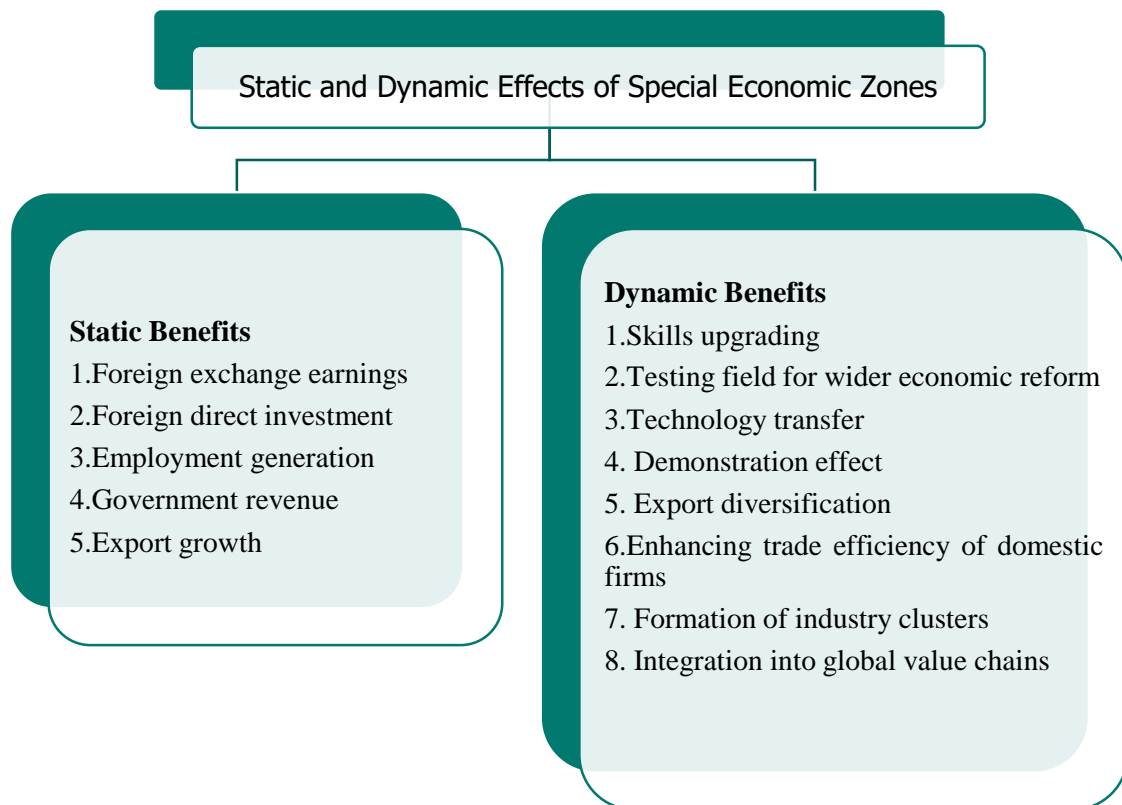
Special Economic Zones (SEZ), on the other hand, are limited geographic regions where the authorities offer some preferential policies or privileges, often with an objective to attract foreign direct investment (FDI).²⁷ It is found that SEZ firms are generally larger, more export oriented, efficient, and more technology prone with international certification and provide more skill trainings to the workers compared to Non-SEZ firms (World Bank, 2012, Omar and Stoeber, 2008, Johansson and Nilsson, 1997). In case of Bangladesh, EPZs²⁸ provide better opportunities within the country in term of suitable location for factories, commercial, financial services and facilities (Bhattacharya, 1998). It has been found in the available literature that on average, the facilities and working condition for factories located in Dhaka EPZ are better than that of outside the EPZ (Zohir, 2001). However, the overall tendencies of non-decentralisation (more prone to urban centre) of industry could possibly explain

²⁷ SEZs are typically geared to one or more of the following economic targets a) attracting FDI; b) Increasing foreign exchange income; c) job creation d) stir up the domestic economy through spillover and linkage effects, technological and human capital upgrading, and cultivation of non-traditional exports; e) Experimentation with different economic policies (Madani, 1999).

²⁸ often literature use the EPZs instead of the SEZs.

the nature of well performing EPZs in Dhaka than the outside. While looking into the case specific benefits, Chaudhuri and Yabuuch (2010) find a positive effect of SEZ on agricultural wage and aggregate employment in the economy. Wang (2013) also finds that the SEZ program increases the foreign direct investment and raises the increases in workers wage which are more than the increase in the cost of living. Wang (2009) in his earlier study on China's SEZs shows that SEZs increases per capita foreign direct investment by 58% and at the same time increases total factor productivity growth rate by 0.6% points. There exists some evidence that China's SEZs led directly to the impressive improvements in standards of living and economic structural change the country experienced during the 1990's and 2000's (Brautigam, 2011). While Bangladesh wishes to take the leading position of apparel export superseding China, the experiences of China could add value to conceptualising the future plan of action. As such, Figure 2 presents a number of static and dynamic benefits of the SEZs.

Figure 2 : Static and Dynamic benefits of SEZs



Source: Zeng (2011)

Often, in the existing literature, though the discussions of the SEZ and industry clusters are pulverized together, however, they are (both in terms of composition and operation) not identical. The distinguishing features of the SEZ and industry cluster are (1) SEZ usually accommodates several industry clusters, whereas industry clusters denote for a particular industry and (2) by definition SEZ provides privileges to attract new investment, both local and foreign whereas industry cluster is more

alien to attract local investors. *In this view and from a broader perspective, establishing separate export oriented RMG zones with special benefits/incentives and allowing foreign investment can be considered as a case of a SEZs targeted for the RMG.*

In this paper, we will analyze the benefit and costs of the proposed 'RMG Palli' in Munshiganj (see Section 4b) which falls within intra-industry clusters where firms within a given industry, facing similar problems and utilizing similar technologies, collaborate to solve those problems and develop new products (Lall, Koo, & Chakravorty, 2003). Again, the concept of RMG Palli can be cited as an example of the pure agglomeration (Gordon, & McCann, 2000). This analysis could provide a reference point for future RMG clusters or RMG SEZ in the country.

4.b. Snap-shot of proposed RMG Palli

BGMEA has signed a Memorandum of Understanding (MoU) with a Chinese company named Chinese Oriental International Holding (OIH) Limited, which has completed the feasibility and environmental study for the proposed Garment Palli. As per the MoU, the Chinese company is expected to establish the Garment Palli, which will have plots with infrastructure facilities, utility services, medical facilities, central effluent treatment plants, day-care centres, roads, drainage facilities, waste dumping yards, fire-fighting equipment, banks, and insurance offices and so on. A snap-shot of the proposed RMG Palli is placed in the Box-4.

Box 4: A snap-shot of proposed RMG Palli

'Garments Palli' has already been listed under the Bangladesh Economic Zone Authority (BEZA)

Area: Bausia, Gojaria, Munshigonj, Dhaka

Total required Land: 530.78 acre

Total estimated cost: 2.3 billion USD

Operation modality: Joint venture (BGMEA and OIH)

Other establishment: Coal based 300 MW power plants

Expected number of total factory: 253

Expected employment generation: 300,000

Expected export earnings: 3-5 billion

Current status- This report is submitted to Department of Environment (DOE) for the approval of the EIA on July 17, 2015

Source: Executive Summary, Feasibility report on the proposed 'RMG Palli'.

The initiative of establishing a specialized zone for garments has been listed under the Bangladesh Economic Zone Authority (BEZA) and a location at Bausia, Gojaria, Munshigonj has been identified for the project. The park will be set up on 530.78 acres of land and it is estimated that the total cost will be USD 2.3 billion. Once fully operational, this facility is expected to accommodate 253 garments factories, which will create jobs for about 300,000 people (i.e. the average labour size per factory is 1186) and will generate early export earnings in the range in between 3 to 5 billion USD. BGMEA and OIH will jointly operate to ensure facility. In this background, assessing the cost and benefit of the proposed Garment Palli will be an added contribution to the country's economic statistics in general and data on RMG in particular.

4.c. Direct (Economic/Export) Benefit

In this section we have made an attempt to estimate direct economic benefit, in terms of export earnings, with respect to the cost related to the 'RMG Palli's project implementation. We have used the available secondary information gathered from the executive summary of the feasibility study of the 'RMG Palli', Bangladesh Bureau of Statistics (BBS), EPZ, BGMEA along with data and information obtained from field survey and through KII.

First of all, it has to be assumed that it will require three years to develop and open the *palli* for production of the garments. We have calculated the BCRs for the next twenty years respectively using the standard discounting factors provided by the CCC.

Secondly, to create the counterfactual using the last ten years data on RMG units, we have obtained an average growth rate of 0.85 for establishing new RMG units (see Table- 4) over this period. It is to be noted that the large negative in growth of RMG units in 2014 following the Rana Plaza accident due to the closures of unsafe factories on non-compliance grounds. Instead of dropping this negative growth, it is considered as a corrective measure to the unplanned and unsustainable expansion of RMG industry and therefore has been included to estimate the long-term average growth of RMG units. Using this average growth rate, we estimate that, in the absence of RMG palli, there would be 111 new RMG units established during next three years (counterfactual scenario). As the RMG palli's implementation period is three years and which will have 253 units, this implies that extra number of units due to the RMG palli intervention would be 142 after three years. In other words, in the following analysis we will find the BCRs for these extra 142 RMG units.

Table 4: RMG Units in Bangladesh during 2005-06 to 2014-15 and projection for next three years.

Year	Number of RMG units	Employment (million)	Growth (RMG units)
2005-06	4220	2.2	
2006-07	4490	2.4	6.40
2007-08	4743	2.8	5.63
2008-09	4925	3.5	3.84
2009-10	5063	3.6	2.80
2010-11	5150	3.6	1.72
2011-12	5400	4	4.85
2012-13	5876	4	8.81
2013-14	4222	4	-28.15
2014-15	4296	4	1.75
Average growth			0.85
2015-16 (estimated)	4333		
2016-17 (estimated)	4369		
2017-18 (estimated)	4407		
New factories over three years	111		

Source: Authors' estimation based on BGMEA data

Thirdly, in Table- 5 a comparative picture of various indicators under counterfactual and for *Palli* factories (data obtained from the feasibility study) has been presented. The benefit of the entire *palli* (i.e., export earnings, once the *palli* is fully operational) is envisaged as 3000 million USD (conservative), 4000 million USD (realistic) and 5000 million USD (optimistic). As we can see, the average size, costs and exports are all considerably higher for *Palli* factories over the national averages. The differences in export earnings, particularly under realistic and optimistic scenarios, are considerably higher when compared to the differences in average establishment costs and employment. However, this is not completely unrealistic given a better capacity utilization which may be achieved through increased productivity, improved and efficient power (gas and electricity) availability and technology spill over effects. To get a reliable estimate we need to consider this and add the differences in average costs and exports for the 111 counterfactual factories with the figures obtained for 142 'extra' establishments in the *palli*.

Table 5: Comparison of Indicators: Palli versus Non-Palli Factories

	Palli	National	% change for Palli over National	Source of National data
No of factories	253	4296		BGMEA
Employment/Factory	1186	931	27.39	calculated based on BGMEA data
Establishment Cost/Factory (Million US\$)	9.09	4.41	106.12	Estimated based on field data and KII
Export Earnings/Factory (Million USD)		5.93		EPZ and BGMEA
Conservative	11.86		99.84	
Realistic	15.81		166.45	
Optimistic	19.76		233.06	

Note: For comparability purpose, the establishment costs of national (non-palli) factories are estimated based on a factory employing 1150 employees. Establishment costs include land costs, building costs and compliance costs (structural, electrical, fire safety, environmental). Costs of machineries have been excluded on the ground that these would be same for both Palli and non-palli factories.

Source: Authors' estimation.

Fourthly, to estimate the costs of the intervention the fixed cost is obtained proportionately for 142 factories (1291 Million USD) plus the total of the differences in costs for 111 counterfactual factories (i.e., $111 \times 4.68 = 519$ Million USD). The total fixed cost of 1810 million USD is disbursed 15%, 40% and 45% over the three years. Variable cost/ running cost is 5% of fixed cost (standard assumption of project implementation). It is to be noted here that this variable cost does not cover the running the factories, it only covers cost related to the operating of the 'RMG Palli'.²⁹

Fifthly, we assume the following capacity utilization rate of the factories: 1st to 3rd Year: 0%, 4th Year: 10%, 5th year: 30%, 6th year: 50%, 7th year: 75%, 8th year: 100%. Then in an analogous way to cost estimates we estimate the exports earnings (benefits) which take in to account the differences in export earnings in the *palli* under various scenarios.

Finally, for a sensitivity analysis we have estimated the costs and benefits of the 142 "extra" factories due to the intervention using the national average costs and exports figures. We will refer this as benchmark scenario 1. Another scenario is constructed assuming that in the absence of Palli, in the next three years exactly 253 new factories will be established. Then the extra cost and extra benefits

²⁹ Exclusion of the factory running costs is justified on the ground that this study attempts to estimate BCRs based on export earnings, and not the profit margin of the factories.

are calculated based on Table 5 information; i.e., palli versus non-palli. This will be referred as benchmark scenario 2.

Table 6: Cost Benefit Analysis of establishing RMG Palli at Munshiganj

Indicators	Based on Palli Feasibility Report			Benchmark 1 (based on National/Field data)	Benchmark 2		
	Conservative	Realistic	Optimistic		Conservative	Realistic	Optimistic
BCR (3%)	8.77	12.51	16.25	8.31	5.62	9.37	13.12
BCR (5%)	7.01	10.01	13.00	7.26	5.04	8.39	11.75
BCR (10%)	5.03	7.18	9.33	5.20	3.80	6.34	8.87
IRR	41%	51%	59%	42%	37%	51%	62%

Source: Based on authors' calculations.

Based on the calculation of benefit to cost ratio (BCR), as shown in Table 6, it is evident that irrespective of the any scenario or discount rate used, the decision to establish a separate 'Garments Palli' will be an economically beneficial decision for the economy with a median value of BCRs of 8.4 over all scenarios (including benchmark 1 and 2). At the end of the intervention period (20 years), the BCRs under the benchmark 1 scenario and conservative scenario is very similar; ranging from 5 to 9. The IRR is also almost same. However, under the optimistic scenario the BCR is almost double as compared to the benchmark. The benchmark scenario 2, with BCRs ranging between 3.8 and 13.1, suggest that establishing new palli would be a better investment option compared to outside palli investment. The net present values of costs and benefits of all scenarios are provided in Appendix Table 4.

While discussing the cost-benefit of such investment, it is pertinent to reveal the other social and micro level benefits of establishment of the RMG industry, which are outside the scope of the study. In the next section, however, we provide an account of the findings in the literature of these benefits. Perhaps, this benefit will supplement the rationale for this big investment decision.

Associated Social Benefits due to Growth in RMG Industry

Apart from the export benefits and contributing to national development, the RMG sector has profound welfare effects at social, household and individual (particularly on women) level. The benefit might come through many avenues such as social benefits by contributing to women's empowerment, higher school enrolment, lowering child birth and marriage (Heath & Mobarak, 2015, HM hereafter). According to Asian Center for Development (2015), the average income of a poor household in Bangladesh is 8,900 taka while average family income for RMG worker is 15,720 taka. In case of asset ownership, 86% own mobile phone, 68% own television, 84% own electric fan, 75% own home and

28% have gold ornaments. About 83 percent of RMG workers can read a letter while 71% can also write in Bengali which is greater than the national average (58%).

For the first time since independence, many females from rural areas have started working outside of the local environment of their homes. The garment industry accelerated change in the area of politics and economics among the working class people. If we consider the term “emancipation of women” from the perspective of narrowly economic terms, the garment industry eased the way. The greatest socioeconomic impact of the Bangladeshi Garment industry has come from the female workers movement (their disposition³⁰ from their rural set-up) in this sector which provided female workers to showcase their hidden potential and made them socially and economically independent (Rahman and Siddiqui, 2015; Atkin 2009). Increasing engagement of women in income generating activities ensures more freedom of decision-making both inside and outside households and increases their social status both within and outside the family (Atkin, 2009). Empowering women through a job also reduces their vulnerability and therefore domestic violence is also reduced. Even female counterparts have a higher spending propensity towards education, house rent, schooling of family members, etc than their male counterparts who earn more than them (Zohir, 2001). Paul-Majumder and Begum (1998) find that intra household work distribution has changed among families where female members work in RMG industries. More than half of female garment workers are helped by their husbands in domestic work and spouse’s involvement in household work increased with the growing participation of women in the garment industry.

While revealing on a more micro-level impacts, Raihan (2010) concludes that remarkable success in RMG exports significantly contributed to the achievement in the areas of child and maternal mortality, life expectancy, net primary enrolment rate, women’s economic participation, gender parity in primary and secondary education, etc. An interesting finding of HM is that places where factories have been operating for 6.4 years have a 0.3 % point lower probability of getting married by that year relative to girls living in control villages in the same district. Another HM finding is that villages with 6.4 years of factory exposure are 0.23 percentage points less likely to have given birth by that year. It is a great concern that Bangladesh is still fighting with maternal mortality rate. One of the core reasons of maternal mortality is tender age of mother (Khosla, 2013). Consequently, Field and Ambrus (2008) found that delay in marriage is associated with an increase in use of preventive health services. Qian,

³⁰ However, this has also registered a number of controversies which has been raised by many authors including Mcmicheal (2010), Soren (2009).

N. (2008) estimated that an increase in women income has an immediate and positive effect on the survival rate of girls. Women and adolescent girls now have better access to nutrition than before (F. Ahmed, Hasan, & Kabir, 1997) which will improve their health and that of their children, through intergenerational effects.

The HM study further revealed that garment workers have 2.8 years more education on average than residents of non-garment villages and education has statistically significant positive effect on wage and productivity. As such, higher education is expected to yield higher income stream in the long run. In this perspective, Atkin (2009) revealed that remuneration from the job increase women earnings and make them more affordable for sending their kids to take primary education. In addition to this, Qian (2008) found increases in women's income can bolster educational attainment of the children of both sexes. These all evidence shows that now more families are investing in girls' education with a view to engage them in the garments industry (Amin, et al., 1998; Rashid, 2006). Field and Ambrus (2008) found strong relationship among delay in marriage, years of schooling and literacy rate; i.e., delay in marriage for an additional year would increase 0.22 additional year of schooling and would increase literacy rate by 5.6 percent.

Such opportunity also draws attention towards women's needs such as health and education, better nutrition, safety, etc. (Bhattacharya et al. 2002). However, in spite of these women being a major resource for the RMG sector, their physical well-being is often ignored. In a study conducted by ILO most of the female garments workers denied having any access to maternity leave although this is a basic labour right (ILO, 2015). Within the RMG industry, 87 percent of women employees suffer from ailments and diseases including malnutrition and anaemia, poor hygiene, inadequate pre- and post-natal care, and exposure to infections and illness (BSR, 2014). Ahmed and Raihan (2014) has pointed out some of the common lacking in the garments industries in Bangladesh that pose high risk to women's health such as unhygienic working conditions, sexual harassment by fellow male workers, unavailability of proper toilet and washroom facilities, unsafe drinking water, insufficient maternity leave, etc. As a matter of fact, workers' wellbeing is a core component of compliance and to achieve a sustainable growth of the RMG sector, these issues should be addressed properly.

It can be envisaged that our proposed two interventions would help the RMG sector to achieve sustainable development and to realize the above mentioned social benefits (empowerment, health, education etc.) to a greater extent. The exact quantification of these benefits, however, is beyond the scope of the current study. Another unquantifiable benefit is the expected reduction to the congestion and resources in the city by discouraging or prohibiting opening up of new units, which will also have many environmental benefits.

Conclusion and Policy Relevance

To cater to this increasing demand of the RMG products, Bangladesh needs a strategic plan, which will create a conducive environment for private sector investment, through targeted initiatives towards technology transfer, upgraded skills and development of appropriate human resources and knowledge-based industries, and by raising labour and capital productivity at the enterprise level.³¹

The BCRs of the proposed 'Garments Palli' signifies the rationale for establishing such a separate zone. The benefit will be accrued both in terms of a direct (export enhancement, productivity rise, global branding) and indirect way (employment generation, ensuring social security and so on). The policymakers and the industry leaders should devote attention to develop proper institutional environment and facilities to employees such as housing, schools, health centres etc., to make it a sustainable intervention. The analysis also endorses other avenues of benefits such as environmental benefits through decongestion in the city, and social benefits by contributing to women empowerment, higher school enrolment, delay in marriage and lower and late child birth. This is significant from the point of view of the country's perspective plan, vision 2021 perspective and Bangladesh's graduation plan from the LDCs to the developing country in 2026. These findings will provide the much needed boost to the RMG sector, particularly to the external players (buyers, retailers and pressure groups) and local aspirants entrepreneurs.

The BCR analysis for the other intervention indicates the necessity of ensuring compliance which is extremely beneficial and important both from the industry perspective and from the perspective of the workers and improved working conditions. The importance of recognizing compliance should be seen as a necessary requirement for sustainable survival of the RMG industry in Bangladesh. Hence, the costs related to compliance should not be seen a constraint for RMG growth, rather it should be considered as a sustainable investment. Ensuring compliance could potentially be a bargaining point for the government to negotiate on getting sufficient investments targeted for compliance and to get back the US generalised system of preference (GSP) facilities which is currently withdrawn due to compliance grounds.

One should note that after three years of the Rana Plaza disaster, Bangladesh has progressed a lot in terms of achieving workplace safety compliance in RMG industry under three plans of actions— National Tripartite Action Plan (NTPA), the European Union Sustainability Compact, and the Accord

³¹Outline perspective plan of Bangladesh 2010-2021: Making vision a reality.

and the Alliance. However, a number of factories were asked for the re-scheduling of their CAPs timeline due to financial weakness. As a response, Accord and Alliance presented their position for not providing financial support for the CAPs, indicating that the burden of such compliance should be borne by the suppliers. This study has estimated the initial investment requirement for ensuring industry-wide compliance ranging between USD 2.1 billion and 4.3 billion. Given the very low profit margin (5.5-8.1%) of the industry (Sobhan, 2013), the financing options for this significant investment, especially for the small and medium sized factories, is of paramount importance. Though the compliance measures largely address symptoms of the problem, it is pertinent to raise a question - *Do the promised global contributions from buyers cover one-off investments to ensure compliance or will this be a regular source of financing for ensuring compliance?* Even if the availability of fund is ensured, the question remains whether that would be adequate to meet compliance obligations at all levels, including the subcontracting firms, of the RMG supply chain.

Separate zoning for the RMG industries and making the factories compliance both from the perspective of sustainable development and ensuring living standard will have a long term impact on the workers in general and overall export performance in particular. However, in order to reap that benefit the issues of ethical buying (including shared responsibility), financial modalities of compliances maintenance costs and particularly ensuring fairer value chain (maintaining price competitiveness) needs to be ensured. The outcomes of these cost-benefit analyses may also be useful to determine the feasibility of such interventions for other manufacturing sectors such as leather and ship building. This research is expected to act as a valuable input for the RMG entrepreneurs to make targeted investment through initiatives towards technology transfer, upgraded skills and development of appropriate human resources, development of knowledge-based industries, and by raising labour and capital productivity at the enterprise level. The investment requirement will provide an impetus to the government to find an avenue to generate funding for the entrepreneurs ranging from the small, medium and large sized factories. It is a policy choice by the policymakers to effectively use the findings and data generated from this study. Similar studies with robust filed empirical evidence could supplement the gaps of the existing literatures.

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Appendix

Table A1: Structural Change (sectoral share of GDP, per cent)

Sectors	Average FY04-FY09	Target FY2015	Target FY2021
Agriculture	21.70	16.0	15.0
Industry	29.00	35.0	40.0
Manufacturing	17.10	26.0	30.0
Service	49.30	49.0	45.0

Source: Outline perspective plan of Bangladesh 2010-2021: Making vision a reality.

Table A2: Bangladesh Export Outlook by McKinsey LLC for FY2016-2020

Indicator	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020	Average FY16-20
Exports (US\$ Billions)	31.6	36.2	40.6	45.8	52.7	58.5	46.8
o/w RMG exports	25	29	32.5	36.4	41.8	46	37.1
RMG growth (%)		16	12.1	12	14.8	10	13
Export Growth (%)	3.5	16	12.2	12.8	15.1	11	13.4

Source: McKinsey & Company (2011) report (Extracted from Seventh Five Year Plan FY2016 – FY2020).

Table A3: Present Value of Costs and Benefits for Compliance (Million US\$)

NPV of costs and benefits at various % level	Scenario 1			Scenario 2		
	Case 1	Case 2	Case 3	Case 1	Case 2	Case 3
3% (costs)	4,758.01	6,661.21	9,516.02	4,758.01	6,661.21	9,516.02
3% (benefits)	134,715.97	134,715.97	134,715.97	97,329.92	97,329.92	97,329.92
5% (costs)	4,146.71	5,805.39	8,293.41	4,146.71	5,805.39	8,293.41
5% (benefits)	104,652.49	104,652.49	104,652.49	77,346.13	77,346.13	77,346.13
10% (costs)	3,100.61	4,340.85	6,201.22	3,100.61	4,340.85	6,201.22
10% (benefits)	59,562.32	59,562.32	59,562.32	46,584.46	46,584.46	46,584.46

Source: Authors' estimation.

Table A4: Present Value of Costs and Benefits for RMG Palli at Munshiganj (Million US\$)

NPV of costs and benefits at various % level	Based on Palli Data			Benchmark 1 (based on National/Field data)	Bench Mark 2		
	Conservative	Realistic	Optimistic		Conservative	Realistic	Optimistic
NPV: 3% (costs)	2,929.52	2,929.52	2,929.52	1,012.73	2,673.91	2,673.91	2,673.91
NPV: 3% (benefits)	25,685.42	36,651.87	47,618.32	8,411.24	15,037.98	25,054.85	35,071.72
NPV: 5% (costs)	2,640.79	2,640.79	2,640.79	912.91	2,352.33	2,352.33	2,352.33
NPV: 5% (benefits)	18,524.58	26,433.69	34,342.80	6,625.84	11,851.22	19,745.37	27,639.51
NPV: 10% (costs)	2,127.46	2,127.46	2,127.46	735.46	1,800.80	1,800.80	1,800.80
NPV: 10% (benefits)	10,709.65	15,282.16	19,854.67	3,826.30	6,851.57	11,415.43	15,979.29

Source: Authors' estimation.

Bangladesh, like most nations, faces a large number of challenges. What should be the top priorities for policy makers, international donors, NGOs and businesses? With limited resources and time, it is crucial that focus is informed by what will do the most good for each taka spent. The Bangladesh Priorities project, a collaboration between Copenhagen Consensus and BRAC, works with stakeholders across Bangladesh to find, analyze, rank and disseminate the best solutions for the country. We engage Bangladeshis from all parts of society, through readers of newspapers, along with NGOs, decision makers, sector experts and businesses to propose the best solutions. We have commissioned some of the best economists from Bangladesh and the world to calculate the social, environmental and economic costs and benefits of these proposals. This research will help set priorities for the country through a nationwide conversation about what the smart - and not-so-smart - solutions are for Bangladesh's future.

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