Impact of Working Environment on Less Productivity in RMG Industries: a Study on Bangladesh RMG Sector

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Abstract- The readymade garments industry (RMG) sector acts as the backbone of Bangladesh economy and is considered as a catalyst for the development of the country. Despite having epic growth of the RMG sector, and its bright prospects, challenges are still there. One of the biggest challenges currently faced by RMG industries of Bangladesh is to ensure better working conditions for the millions of garment workers which might have salient impacts in accelerating productivity to compete in global export market. So, it was imperative to observe the significance of working conditions on the productivity of RMG sector. By the research work different parameters of working environment leading to less productivity of RMG industries are identified and examined through the application of some important statistical tools like descriptive analysis, analysis of variance (ANOVA) and hypothesis test. Based on empirical analysis crucial environmental factors are underscored to improve the productivity of those industries.

Keywords: working environment, less productivity, rmg sector, multiple regression, anova, hypothesis.

I. Introduction

The Readymade Garments (RMG) industry plays a vital role in economic growth of Bangladesh which contributes to 76% of national exports and 90% of manufacturing goods exports (Export Promotion Bureau of BD, 2011). The garment industry is highly labor-intensive and employs approximately two million workers, out of which 90 per cent are women (UNIDO, 2011). Despite having the magnificent growth, RMG sector is facing some challenges now-a-days. One of the biggest challenges currently faced by RMG industry of Bangladesh is to ensure workplace safety and better working conditions for the millions of garment workers. Two major accidents, the Tazreen fire and the Rana Plaza collapse, have brought the issue of workplace safety to the fore and led all stakeholders to act accordingly. The government, the International Labor Organization (ILO) and the buyers have been working together to improve working conditions in garment factories and the discontent of workers over wages has also subsided to a great extent with the implementation of the new wage board award. Bangladesh is now improving its competitiveness in this major manufacturing industry by reducing total production and distribution time, which will improve surface-level competitiveness by improving total productivity. Simply stated when people produce something with least amounts of resource being used then it can be called as productivity. It has been further explained that productivity is the ratio how well an organization converts input resources into goods and services [1]. The level of productivity surely depends on workers performance but there is a single most influential factor that can affect the performance of workers during production and that is the working environment. The quality of comfort derivable from work environment determines the level of satisfaction and productivity of workers. If the working environment is not conducive then the productivity of the workers cannot be optimized.

Plummeting productivity in the RMG sector of Bangladesh is a prime concern that can compromise the level of output and ultimately hurt the overall economy of Bangladesh. That is why workforce productivity remains a primary element for success in most organizations especially in the manufacturing industry like the RMG sector. Productivity is defined as a measure of quantifying the output against the amount of input. It expresses the relationship between the quantity of goods and services produced (output) and the quantity of labor, capital, land, energy, and other resources to produce it (input) [2]. It has been shown in different studies that the condition of the work environment and the productivity is inextricably linked [3-7]. The work environment is a composite of three major sub environments viz: the technical environment, the human environment and the organizational environment [7]. The work environment has effect on the performance of employees. The type of work environment in which employees operate determines the way in which such enterprises prosper. The physical layouts along with the effective and efficient management processes are playing an important role in enhancing employees' productivity and organizational performance [1]. Work environment as "an entirely" which comprises the totality of forces, actions and other influential factors that are currently and, or potentially contending with the employee's activities and performance [3]. Work environment is the sum of the

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interrelationship that exists within the employees and between the employees and the environment in which the employees work [4].

It is quite evident now that there can be lots of influential work environment factors that can inhibit the performance of the workers and the result will be low productivity. So to have a deep understanding it is an essential prerequisite to examine the work environment factors that is responsible for less productivity. It is the number of management functions: provision of adequate fringe benefits, supervision, work method and organization, in the work environment which appear to have been the key factor inhibiting higher productivity [8]. It has also been identified supervision, subordinates, co-workers inefficiency as the major variables that influence productivity [9]. The empowerment of employees and the flexibility of the working environment are covered by three key productivity factors: "inadequate supervision and employee involvement in decision-making, too much work, and insufficient rewards and chances to advance" [10]. Inefficient planning of work and organizational structure by management followed by poor management leadership in demonstrating and leading change are the two greatest obstacles to productivity [11]. In a survey it was reported that nine out of ten workers believed that a workspace quality affects the attitude of employees and increases their productivity [12]. It has been confirmed in another research work that unsafe and unhealthy workplace environment in terms of poor ventilation, inappropriate lighting, excessive noise etc. affect workers productivity and health [13].

However, the manufacturing sector especially the apparel industry in many countries is in a state of transition. Owing to the intense competition faced by the labour intensive, low cost and wage economies manufacturing giant like China, India, the established players prefer to move up the manufacturing value chain to compete on technology and innovation. As a result manufacturing companies try to redefine, redesign and improve their production systems to meet the competitiveness demanded by the challenges of present markets [14-15]. However in this prevailing situation, the Bangladesh's RMG sector has not yet achieved its full potential. Considering this situation, this study will examine the major working environmental factors causing low productivity in RMG sectors of Bangladesh. There are a lot of studies on the RMG sectors of Bangladesh but few literatures have been found scrutinizing the working environmental factors responsible for low productivity.

II. Methodology

The study had been carried out in four RMG industries (appendix-A) of Bangladesh having variation in its production capacity and product category (woven or knit). The objectives of this study were to identify and examine the working environment factors causing low productivity in RMG sectors of Bangladesh, to what extent are factors in the work environment perceived as having adverse effects on productivity?, how important are some specifically named facilities in the work environment to enhancing workers' productivity? And to obtain different aspects relating to the working environment and productivity in the garments sector that improves the understanding about the concepts.

The survey instrument is considered in three parts. In the first section demographic data was collected, the second section was on the rating of different independent variables to see their impact upon less productivity and in the section three several questions were asked to the respondents to state their agreement of each of the statement on a five point rating scale (1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree, 5-Strongly Agree). We have used multiple regression for our data analysis. The purpose of this mechanism is to measure the relative influence of each independent variable (insufficient and ineffective co-workers, inadequate monetary and non monetary rewards, political chaos in the country, outdated system, ineffective management, discrimination and biasness inside the organization, unsafe and unfavourable working condition in the workplace) on the dependent variable (less productivity in the RMG sector). Thus following model is developed to test the significance of stated relationship. The regression used in a model is given below:

$$Y_{(Less\ Productivity\ in\ RMG\ sector)} = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + e_i$$

Where, $b_0 =$ Constant

$X_1 =$ Ineffective Management

$X_2 =$ Outdated system

$X_3 =$ Inadequate monetary and non monetary rewards

$X_4 =$ Unsafe and unfavourable working condition in the workplace

$X_5 =$ Insufficient and ineffective co-workers

$X_6 =$ Political chaos in the country

$X_7 =$ Discrimination and biasness inside the organization

$e_i =$ Error term

The relative significance of each of the independent variable on the dependent variable can be measured from the associated coefficient. We also will test the hypothesis based on the significance level below 0.05 where H_0 is the null hypothesis and H_1 is the alternative hypothesis, the hypothesis breakdown is given below:

H_0 : H_1, H_2, H_3, H_4, H_5, H_6 and H_7 do not have any impact on less productivity in the RMG sector

H_1 : Ineffective Management has a strong impact on less productivity in the RMG sector

H_2 : Outdated system has a strong impact on less productivity in the RMG sector

H_3 : Inadequate monetary and nonmonetary rewards have a strong impact on less productivity in the RMG sector

H_4 : Unsafe and unfavourable working conditions have a strong impact on less productivity in the RMG sector

H_5 : Insufficient and ineffective co-workers has a strong impact on less productivity in the RMG sector

H_6 : Political chaos has a strong impact on less productivity in the RMG sector

H_7 : Discrimination and biasness in the workplace has a strong impact on less productivity in the RMG sector

III. DATA ANALYSIS AND FINDINGS

In order to analyze the results of our collected data we firstly described the descriptive statistics, then the model summary with the significance level of the data after that we moved to the analysis of variance (ANOVA) to see the F statistic and finally we described parameters with Beta co-efficient to see what is the level of influence of predictors on the low productivity in the RMG sectors.

a) Descriptive Analysis of the Sample

The questionnaire was completed using face to face interviews, for 15 days in 4 different garment factories in Dhaka and nearby locations namely, Style Garden Ltd., Fakir Apparels Ltd., AJI Apparels Industry Ltd. and MIM dresses Ltd. We completed around 112 questionnaires but after eliminations of those containing errors, we finally retained 100 where the skilled workers (65%) were the most, the rest dominant respondents were the semiskilled (24%) workers. The sample was unbalanced in terms of male-female ratio (Male was 32% and the Female 68%) and most of the respondents ages was between 20-25 (78%) where, ages more than 25 was about 18%. Since the low productivity is a negative issue and the size of our questionnaire was quite elaborative, we conduct the interviews considering the respondent's convenient time to give them enough time to deduce the unbiased and logical responses.

Table 1 : Descriptive Statistics

Working Environmental Factors	Mean	Std. Deviation	N
Ineffective Management	4.41	0.647	100
Discrimination and biasness inside the organization	2.99	1.040	100
Outdated system	4.38	0.774	100
Inadequate monetary and non monetary rewards	4.20	0.829	100
Political chaos in the country	2.90	1.000	100
Unsafe and unfavourable working condition in the workplace	4.17	0.682	100
Insufficient and ineffective co-workers	4.08	0.761	100

It is quite evident from the table 1, that the mean response was highest in the ineffective management (m=4.41) variable that means most respondents agree that there is a positive influence of this factor on the less productivity and the outdated system (m=4.38), rewards (m=4.20), unsafe environment (m=4.17), ineffective co-workers (m=4.08) in the descending order of importance have also positive responses on less productivity from the respondents of the RMG sector. But it is found that the political chaos (m=2.90) and discrimination in the workplace (m=2.99) are the two variables that concede neutral or negative responses from the respondents.

Table 2 : Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	0.811ª	0.658	0.602	0.255	0.658	11.569	7	42	0.000	0.380

In table 2, we found a strong correlation (R= 0.81 or 81%) between the predictors or independent variables and the less productivity in the RMG sectors. The R2= 0.658 that means predictors can explain 65% of the variation in low productivity that seems very good. The most important thing in this table is adjusted R2(0.602) that suggests adding each of the independent variables after the first independent variable, makes a 60% contribution in explaining the variation in the less productivity in RMG sector and the significance F change (0.000) is significant at 99% that is very satisfactory to prove the model is very fit and the Durbin-Watson residual factor is 0.380 that is quite close to 0 denotes the study has been done in an exhaustive way leaving very few responses been examined.

b)   Analysis of Variance (ANOVA)

Table 3 : Analysis of Variance (ANOVA)

	Model	Sum of Squares	Df	Mean Square	F	Significance
1	Regression	5.268	7	0.753	11.569	0.000[a]
	Residual	2.732	42	0.065		
	Total	8.000	49			

Here "a" indicate predictors (Constant): Insufficient and ineffective co-workers, Political chaos in the country, Discrimination and biasness inside the organization, Inadequate monetary and non monetary rewards, Ineffective Management, Unsafety and unfavourable working condition in the workplace, Outdated system.

In table 3 we analyzed the variance of the variables loaded in the model to examine if there is any relationship exists between the dependent variable less productivity and the independent variables. The significance level of the F value determines the goodness of fit of the model. Typically, if significance is greater than 0.05, we conclude that our model could not fit the data. If significance < 0.01, then the model is significant at 99%; In this study, we can see that significant is 0.000 that is < 0.01; so we can conclude that the model is significant at 99% and we can accept the model.

Table 4 : Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Significance
	B	Std. Error	Beta		
(Constant)	1.195	0.268		2.317	0.003
Ineffective Management	0.789	0.032	0.318	3.707	0.000
Discrimination and biasness inside the organization	0.049	0.072	0.326	0.991	0.241
Outdated system	0.510	0.030	-0.189	2.667	0.002
Inadequate monetary and non monetary rewards	0.474	0.032	0.638	2.044	0.001
Political chaos in the country	-0.038	0.031	0.046	0.115	0.910
Unsafe and unfavourable working condition in the workplace	0.422	0.052	0.034	0.109	0.000
Insufficient and ineffective co-workers	0.313	0.076	0.316	1.131	0.004

(Model column group labeled "1")

Analysis of coefficient provides us which independent variables have significant relationship with the dependent variables and provides us the importance of each independent variable independently. Here, Beta (B) depicts that every unit change in the independent variable can cause a certain portion impact on the dependent variable. To clarify the coefficient the following regression model is formulated:

Less Productivity in RMG Sector (Y) = 1.195 + 0.789*Ineffective Management + 0.049*Discrimination

in the workplace + 0.51*Outdated system + 0.474*Inadequate monetary and monetary rewards - 0.038*Political Chaos + 0.422*Unsafe working condition + 0.313*insufficient and ineffective co-workers

The relative coefficient of independent variables describes the relative importance to contribute the less productivity in RMG sector.

c) Testing of hypothesis

Here, we see that the Ineffective Management (0.000), outdated system (0.002), inadequate monetary and monetary rewards (0.001), unsafe working condition (0.000), insufficient and ineffective co-workers (0.004) have a strong [Significance at 0.05 levels] impact on the less productivity in the RMG sector of Bangladesh. From these results we can validate the following hypothesis:

H_1: Ineffective Management has a strong impact on less productivity in the RMG sector

H_2: Outdated system has a strong impact on less productivity in the RMG sector

H_3: Inadequate Monetary and nonmonetary rewards have a strong impact on less productivity in the RMG sector

H_4: Unsafe and unfavourable working condition has a strong impact on less productivity in the RMG sector

H_5: Insufficient and ineffective co-workers has a strong impact on less productivity in the RMG sector

The following two hypotheses are rejected completely because in both cases the significance level was above 0.05:

H_6: Political chaos (0.910) has a strong impact on less productivity in the RMG sector

H_7: Discrimination and biasness in the workplace (0.241) has a strong impact on less productivity in the RMG sector

Thus, we can conclude that the less productivity in the RMG sector caused mostly by the ineffective management, outdated system of the factory, Inadequate Monetary and Non-monetary rewards, Unsafe and unfavourable working environment and the Insufficient and ineffective co-workers. Ineffective management is the most significant factor (Every unit of ineffective management can cause 0.789 unit of less productivity) that have strong impact a on the less productivity followed by Outdated system, Inadequate Monetary and non Monetary rewards, Unsafe working conditions and the insufficient and ineffective co-workers. The Discrimination and biasness in the workplace does not seem to have a strong impact (can cause only 0.049 unit of less productivity) upon less productivity. The Political chaos in the country is the only factor which is not considered as the criteria that can have some impact on less productivity.

IV. Conclusions

One of the main reasons why the developing country like Bangladesh cannot burgeon rapidly is underutilizing the resources available. The RMG sector in Bangladesh is now prospering in a brisk manner that can be an opportunity for Bangladesh to familiarize it as an industrialized country but the problem is it barely capitalizes its human and other resources that can give it a much needed competitive advantage than that of other countries. To be so, it should boost up the productivity of this industry in the highest level and reconcile all the negative issues that can have even a slim negative impact on this mammoth sector.

V. Acknowledgement

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Appendix-A

RMG Industry Profile

Name of the Industry:

Style Garden Ltd.

Location	: Mirpur-12, Dhaka-1216.
Type	: Only garment making
Nature	: Supporting industry
IE activities	: None
Certification	: None
Clients	: Exposures Ltd.
Production lines	: 01
Production capacity/day	: 550 pieces
Workforce	: 150
Type of products manufactured	: Ski Jacket and Long Pant

Fakir Apparels Ltd.

Location	: BSCIC, Hosiery Industrial Estate, Narayangonj.
Type	: Composite (Knitting, Dyeing, Printing & Garment)
Nature	: 100% export oriented industry
IE activities	: Yes
Certification	: Oeko-Tex and WRAP
Clients	: H & M, Gap, Levi's, Esprit, S.Oliver, Tesco etc.
Production lines	: 90
Production capacity/day	: 1, 40, 000 pieces
Workforce	: 7,500
Type of products manufactured	: T-Shirt, Polo Shirt, Tank Top, Mens Shorts etc.

AJI Apparels Industry Ltd.

Location	: 226, Singair Road, Hemayetpur, Savar, Dhaka.
Type	: Composite (Knitting, Dyeing, Printing & Garment)
Nature	: 100% export oriented industry
IE activities	: Yes
Certification	: ISO
Clients	: Carrefour, Tesco, Wal-Mart, Sears, K mart etc.
Production lines	: 44
Production capacity/day	: 48, 600 pieces
Workforce	: 2, 200
Type of products manufactured	: Mens Polo Shirt

MIM Dresses Ltd.	
Location	: Baishaki Super Market (2nd Floor), Mirpur-1, Dhaka.
Type	: Only garment making
Nature	: Sub-contract industry
IE activities	: None
Certification	: None
Clients	: New Yorker
Production lines	: 02
Production capacity/day	: 2, 400 pieces
Workforce	: 200
Type of products manufactured	: Mens Half Shirt and Ladies Skirt

APPENDIX-B

(Questionnaire for Impact of Working Environment on Less Productivity in RMG Industries)

Section 1: Demographic Data

The following questions are related to demographic information. For each question, please choose one answer that is the most appropriate for you.

1. What is your Gender?   ☐ Male   ☐ Female
2. What is your Age?   ☐ 15-24   ☐ 25-34   ☐ 35-44   ☐ 45-54   ☐ 55 and above
3. What is your monthly income in BDT?   ☐ Less than Tk. 2000   ☐ Tk. 2000-3000   ☐ Tk.3000-4000   ☐ Tk.4000-5000   ☐ More than 5000
4. What is your Level of Education?   ☐ No education   ☐ Primary   ☐ Secondary   ☐ Diploma   ☐ Higher secondary or Higher
5. What is the working duration of you in this company in Years?   ☐ 1-2   ☐ 3-4   ☐ 5-6   ☐ 7-8   ☐ Over 8
6. What is your skill level?   ☐ Unskilled   ☐ Novice   ☐ Semi skilled   ☐ Skilled   ☐ Expert

Section 2: Rating the factors responsible for low productivity in your garments industry

Dear respondent, Please rate the following factors regarding the reasons of less productivity in your organization:

Factors responsible for low productivity	1 (lowest)	2	3	4	5 (highest)
1. Ineffective Management (uneducated and inexperienced management body)					
2. Discrimination					
3. Outdated System					
4. Inadequate monetary and non-monetary rewards					
5. Political Chaos					
6.Unsafe and risky environment					
7. Insufficient and ineffective co-workers					
8. For others, please specify:					

Section 3: Questionnaire regarding workplace environmental factors responsible for low productivity in RMG industries

The workplace environment is highly accountable for the efficiency of the workers; workers usually respond and do better in the favourable working environment. So, the negative environmental factors

those are responsible for less productivity needs to be identified. Please indicate how you strongly agree or disagree to the following statements and just stipulate the tick (√) marks in the box:

1. Strongly disagree   2.Disagree   3.Neutral
4. Agree   5. Strongly agree

Sl. No.	Statement	1	2	3	4	5
1.	Positive philosophy/culture of management body enthuse me to work productively					
	Inefficient planning of work and the organizational structure imposed by management affects the working environment that leads to low productivity					
	Strict supervision affects the concentration of doing my job properly					
	Because of inadequate and inexperienced supervision there is a limited chance to advance					
	The team leaders rude behaviour affects the performance of my job					
	The autocratic and non-participative leadership of superiors hampers my productivity					
2.	The overall sophisticated operational system and the technologies helps me to give my best outcome					
	Insufficient equipment and outdated system of resource processing lowers the productivity of work					
3.	The recognition of my performance motivates me to work hard					
	Regular payment of salary and wage encourages me to give the organization my favour in return					
4.	The proper lighting, ventilation, available space to move on assists me to foster my ability to take workload					
	The suffocated atmosphere, the physical layout inside the workplace vacillate my productivity					
5.	Presence of safety equipment and hazard prevention facilities increases my productivity					
	I always become tensed about the safety and health hazard issues that lowers my productivity					
6.	Inefficient co-workers linger the process that lowers my productivity					
	I feel my performance usually boosts up when I work with the likewise skilled person					
7.	The biasness and discrimination in the workplace affect my working ability					
	The political instability prevailing in the country affects my performance					