

## Research Article

# Impact of Supply Chain Management on Productivity in RMG Industry of Bangladesh

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## Abstract

RMG manufacturers are working hard to face the challenges by introducing production engineering, technological upgrade etc. The RMG industry is the prime driving wheel of the economy of Bangladesh. The targeted export volume is 50 billion us dollar within 2021 with confronting various issues and most likely one is green product and production. The industry is adopting SCM and getting different sorts of advantages. A practical survey was done directly on different stakeholders of the industry to realize on the current practices and lacks regarding supply chain management practice in RMG industry. As various parties like supplier, buyer, manufacturer etc. involved in SCM implementation and every stage of order completion is depending and interlinked to each other. This study has considered the order processing, warehouse, inventory management, customer care, forecasting etc. of SCM and tried to monitor how they can influence productivity in terms of lead time, profit margin etc. by implementing SCM in RMG industry. By using statistical survey found some key factors which facilitate production in RMG industry. Earlier accomplishment of whole production process was prolonged as well as time consuming as most of the process recording tasks were done by manually to transform from one to another department. The impact of implementing SCM has been observed throughout the different stages of the production process like order processing which is done by several steps, warehousing, inventory management etc. to improve productivity as how SCM is sprinkling some spirited favor in terms of lead time, profit margin, quality etc. positively which is very competitive and way of getting privilege to sustain in this turbid/dim and volatile market of RMG industry in Bangladesh.

**Keywords:** SCM; RMG; Productivity

## Abbreviations

SCM: Supply Chain Management; RMG: Ready Made Garment

## Background

The Ready-Made Garments (RMG) industry carries a leading position in the Bangladesh economy. During the last 25 years, it is the prime exporting industry in Bangladesh, which experienced extra ordinary growth. If we look at the RMG export rate from at the beginning from 1980's to 2017's then we can easily understand the evolution of this process. By taking advantage of Multi Fiber Agreement (MFA) of GATT (General Agreement on Tariffs and Trade), quota free access to global market etc. the industry plays a key role in employment generation and in the provision of income to the poor. To remain successful, Bangladesh needs to remove all the technological obstacles as well as structural obstacles in the transportation facilities, telecommunication network, and power supply, management of seaport, utility services etc [1].

Now-a-days some of the renowned factories are practicing supply chain management system at their premises and getting competitive advantage than others like reduced cost, lower lead time, higher quality etc. by means of productivity improvement. On the other hand, those who are not applying supply chain management confronting various problems like discount, air freight, lower quality,

high lead time etc. So, it would be a great advantage for readymade garment industry if they apply supply chain management with latest software [2].

Bangladesh has been the one of the biggest export trade country of RMG and Apparel in the world market. This industry started in Bangladesh at the late 1970s, expanded heavily in the 1980s and boomed in the 1990s. The quick expansion of this industry was possible because of the use of less complicated technology, cheap labor, easy to operate sewing machines. A supply chain is a system of organizations, people, technology, activities, information and resources involved in moving a product or service from supplier to customer. Supply chain activities transform natural resources, raw materials and components into a finished product that is delivered to the end customer [3,4].

## Research Methodology

### Methodology

Three research methods consisting content analysis, questionnaire, interview and case study have been used in this study. Explanatory part of the study is done with content analysis. The content analysis included Publications review, Newspaper review etc. Through interview and questionnaire methods, data has been collected for the study.

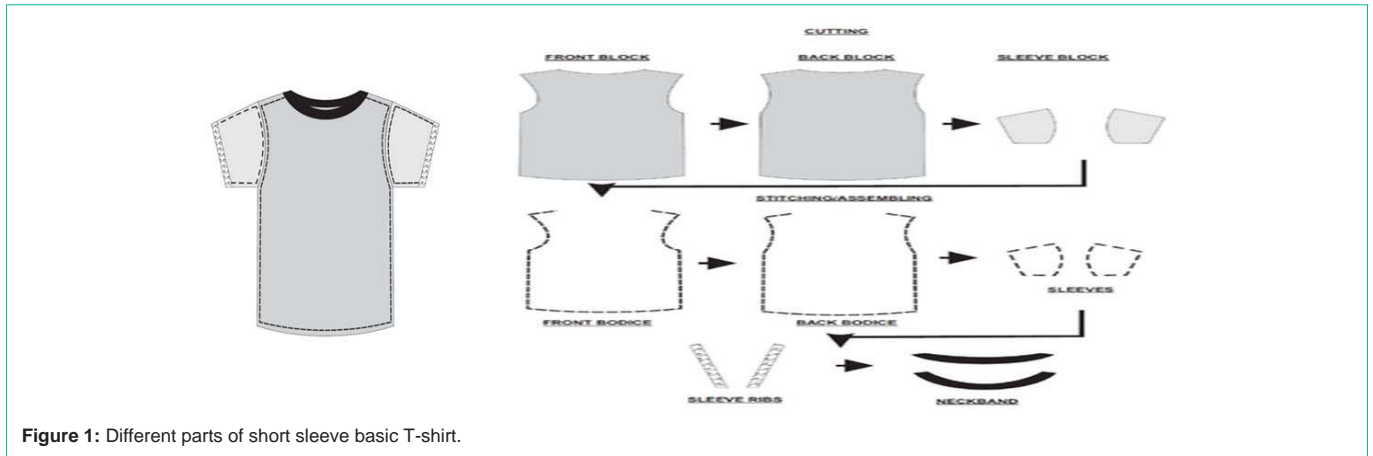


Figure 1: Different parts of short sleeve basic T-shirt.

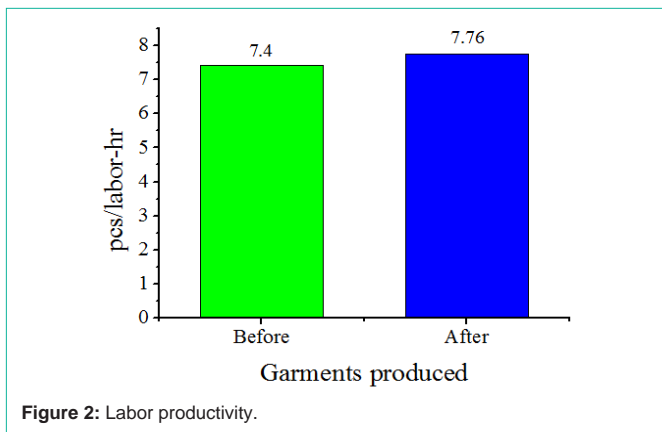


Figure 2: Labor productivity.

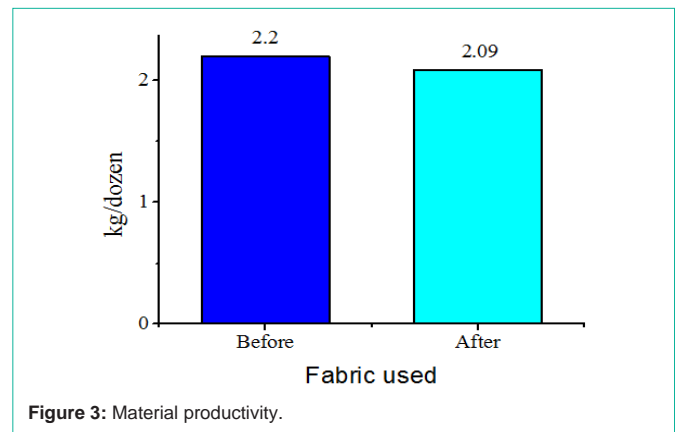


Figure 3: Material productivity.

**Source of data**

Primary data have been collected through face to face interview of different personnel of the organizations including owners’, buyers, officials etc. along with analysis and calculation of record data.

Secondary source of data are journals, different books and articles, Govt. publications, websites etc.

**Sample size and structure**

Due to time constraints, only twenty-nine different textile organizations are covered under this survey. Though these industries were chosen arbitrarily but there was an intension that to attach industries those maintaining best practices on SCM. Sixty-one respondents were interviewed from different industries; among the respondents, there were from the different level of management of SCM. Snowball sampling is used to go in contact of resource persons.

**Data Analysis and Fieldwork on SCM**

**Personal profile and age of the respondents**

Distribution of respondents is done by age, education and working experience. There were different levels of management personnel who are involved with SCM and age in between 26 to 45 years are selected as a respondent for this fieldwork. There was a structured questionnaire, which is part 1, consisting eight sections of questions.

**Comparative study on SCM practice among selected RMG industries**

Comparative study is carried out among such renowned RMG industries like Urmi Group, Masco Group, Dird Group, DBL Group, Ananta Apparels Ltd. We have collected data by 2 sets of questionnaires, among them second set of questionnaires was used to compare and portray the present scenario and impact of supply chain management throughout the process and productivity of above mentioned RMG industries.

**Case study for calculating productivity**

Productivity does not reflect how much we value the outputs - it only measures how efficiently we use our resources to produce them [5].

A case study is carried out on Urmi Group on respect to productivity improvement (Figure 1).

Introduced SCM department: 2015

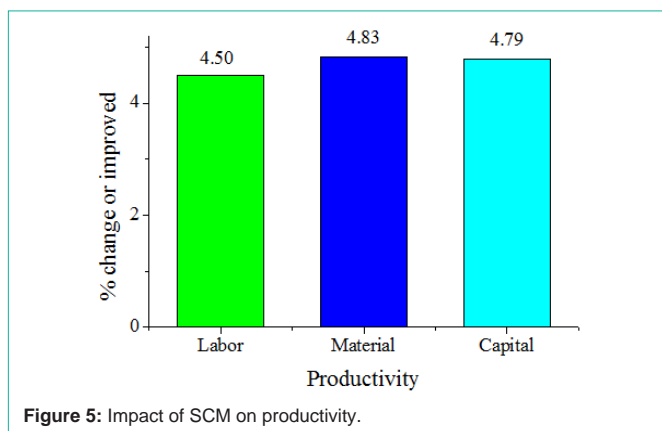
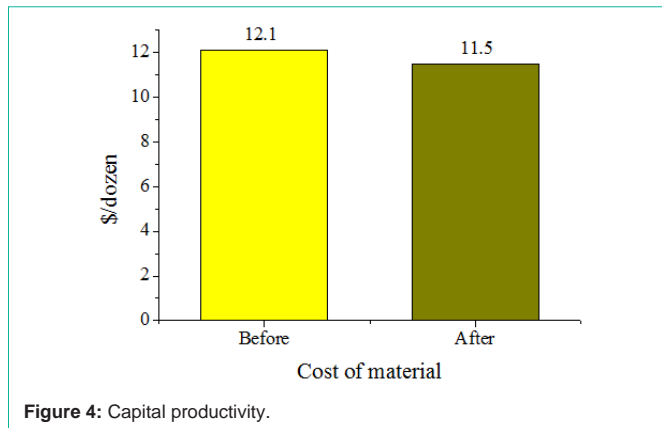
Garments Item: Short sleeve Basic T-shirt

Allocated line: 02

Allocated machine in a line: 25

Production time: 08 hours

Target production: 1600 pcs per shift in a line



G.S.M: 165

Consumption: 2.2 kg/dozen

Fabric price: \$ 5.5/kg

From the data from (Table 1), which is collected from production floor, the multifactor productivity is calculated i.e labor, material, and capital.

Productivity = output/input

And, Productivity efficiency =  $\text{output}/\text{input} \times 100$

### Labor productivity

From (Table 2), before SCM implementation it was in average 1480 pcs/shift because of lack of correct on time material flow, lack of operator supervision, lack of system management etc. But after SCM implementation, by ensuring correct flow of materials and other resources it becomes 1552 pcs/shift. Graphically it is shown in (Figure 2).

### Material productivity

From the data collected from the production floor which is shown in (Table 2) that 2.20 kg fabric is used per garments. But after implementation of SCM there is various software's are used, like intelloCut, to ensure optimum the material use and minimize the wastage. It is calculated that 4.78% fabric is saved after intelloCut software and so that; 2.09 kg fabric is used per garments now. Graphically it is shown in (Figure 3).

### Capital productivity

As fabric consumption is reduced, and fabric price is \$5.5/kg is confirmed by the buying personnel, so cost of material is reduced. Before implementation of SCM, cost of material was \$ 12.1/dozen ( $2.2 \times 5.5$ ) of garments which is now \$ 11.5/dozen ( $2.09 \times 5.5$ ). Graphically it is shown in (Figure 4).

## Result and Discussions

At the time of interviewing and questionnaire survey it is found that throughout the whole production process various stages of production are getting faster and efficient after using supply chain management in terms of productivity as well as lead time and profit.

### Order processing

From analysis, it is concluded that by using supply chain management, order processing system get some advantages like-

- Becomes efficient with EDI
- Access of IS of suppliers & customers
- Helps to determine the inventory, order & shipment.

### Warehouse

From explanation, it is found that by using supply chain management system warehouse management facilitate production by following ways-

- WMS enhance interlinking within the SCM
- Bring efficiency in production
- Helps to keep other functions updated like finance, planning, sales etc.
- Helps to ship product on time.

### Forecasting

It is elicited that forecasting is very much important in effective production, and by using supply chain management forecasting aid the effective production by pursuant ways-

- Ensure demand, and coordinating activities to meet the target of the organization
- Helps to create balance with inventory
- Ease to construct efficient personnel to forecast.

### Purchasing

From analyzed data, it is vindicated that by implementing SCM in production one of function purchasing has gone through some change which facilitate effective production like-

- Increase continuous monitoring on purchasing
- Refrain from risky purchasing which may lead an organization to disaster.

### Inventory management

By implementing SCM all over the production process, IM is taken very importantly because of it exhibits some vigorous advantages like-

- Facilitate to achieve high levels of customer service

**Table 1:** Production layout of short sleeve basic T-shirt.

SL	Process	Machine Name	Machine Quantity	Production target	Obtained production before SCM	Obtained production after SCM
1	Shoulder Joint	Over Lock	2	200 pcs/hr	190	198
2	Rib Tack	Plain Machine	1	200 pcs/hr	188	197
3	Neck Joint	Over Lock	2	200 pcs/hr	187	196
4	Neck Tape Joint	Plain Machine	3	200 pcs/hr	187	196
5	Neck Top sin	Plain Machine	3	200 pcs/hr	187	196
6	Sleeve Hem	Flat Lock	2	200 pcs/hr	187	195
7	Sleeve Joint	Over Lock	2	200 pcs/hr	186	195
8	Side Seam	Over Lock	3	200 pcs/hr	186	195
9	Sleeve tack	Plain Machine	2	200 pcs/hr	186	195
10	Sleeve soap tack	Plain Machine	2	200 pcs/hr	185	194
11	Body Hem	Flat Lock	2	200 pcs/hr	185	194
12	C/Label Joint	Plain Machine	1	200 pcs/hr	185	194
	Total		25	1600 pcs/shift	1480 pcs/shift	1552 pcs/shift

**Table 2:** Productivity analysis on SCM implementation.

SL	Metering	Productivity		Productivity Efficiency		
		Before	After	Before	After	% change or improved
1	Garments produced or Labor productivity	7.4 pcs/ labor-hr	7.76 pcs/ labor-hr	92.5	97	4.50
2	Fabric used or Material productivity	2.2 kg /dozen	2.09 kg/dozen	91.82	96.65	4.83
3	Cost of Fabric or Capital productivity	\$ 12.10/dozen	\$ 11.50/dozen	91.82	96.61	4.79

- Mostly associated with manufacturers, distributors, retailers and customers
- Typical IM initiates JIT, VMI etc.

### Business information

By analyzing the data, it is deduced that SCM open the new window and that is BI. BI helps the organization to capture the orders of renowned buyers by the imitating ways-

- Aid to sprinkle good will of a company
- Ensure product flow from supplier to end customer
- Wi-Fi, RFID, GPS etc. upgrade the information content, quality and speed.

### Customer care

Customer care is very much important in effective production, and by using supply chain management customer care aid the effective production by pursuant ways-

- Aid to provide the full & quality service
- Reinforce customer satisfaction & build long-term customer loyalty
- A means of generating profit from customer support activities.

### Privilege advantage

SCM reveals as a source of competitive advantage in terms of many ways like-

- Reduce the cost of transaction as increase profit margin, & profit margin is increased by 2-4%
- Reduce the time of transaction as shorten the lead time, & lead time is reduced by 15-35 days
- Productivity improvement about 5% after introducing SCM in RMG industries of Bangladesh.

The (Figure 5) is drawn regarding impact of SCM on productivity.

## Conclusion and Future Recommendation

The goal of this thesis was to find out the impact of SCM on productivity and for that it was needed to observe the effects on production process after supply chain implementation so that it can be calculated how productivity change as an impact of SCM in RMG industries of Bangladesh.

A case study is carried out on Urmi Group to calculate the productivity which was the ultimate goal. A short sleeve basic T-shirt's productivity is calculated in terms of labor, material, and capital productivity.

If the Bangladesh readymade garments industry, follow the proper conceptual model of SCM with updated MIS and operating software's which prescribed in this exploratory research then it will be more effective to achieve efficient SCM throughout the manufacturing process and possible to keep pace with the global market. This paper assigns further scope or frontiers for prospective researchers as well as practitioners those are involved with RMG industry of Bangladesh by adopting new thinking towards modern approach of supply chain

management in wide range of product item which wasn't possible in this study due to limited access in production floor as well as SCM department.

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