

ANALYSIS OF THE FACTORS AFFECTING THE LEAD TIME FOR EXPORT OF READYMADE APPARELS FROM BANGLADESH; PROPOSALS FOR STRATEGIC REDUCTION OF LEAD TIME

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Abstract

A lead time is the latency between the initiation and execution of a process. In apparel industry, lead time is the total amount of time required for completing a product beginning from the date of receiving the order to the shipment of the goods to customer. Time is a great issue in apparel trade as orders are based on weather, seasons and occasions. Lead time hence, carries huge importance when delivering the products to the respective outlets is concerned. Bangladesh, though the second largest exporter of readymade apparel to the world, still to prevail the on-time issues. The study commenced with the identification of back-locks affecting the lead time in the apparel industry. A three step strategy is proposed through this study to ensure a shorter lead time.

Keywords: Lead time, apparel trade, readymade apparel, supply chain

Introduction

Bangladesh is one of the most important global players in the readymade apparel trade in the world followed only by China in terms of values exported. Apparel trade is characterized with fast and instant response where consumer's choice plays the front role. Consumer's choice changes rapidly with seasons and occasions; as a result apparel retailers are always in a pressure to supply the desired fashion before the fashion trend is out dated. This pressure is interpreted in the apparel production houses as to reduce in their lead time. Bangladesh is not famous for prompt production solutions and the apparel industry is historically known to miss the time-target often. Rather, global retailers source form Bangladesh due to better competitiveness in cost and sustainable quality that makes it up for them even if the shipment is delayed for some days. Hence, improvement in lead

time management of Bangladesh' readymade apparel industry could be a great help for both the industry and the retailers. This study identifies broadly the problematic areas in this regard and a three step (immediate, middle-term and long term) solution is recommended to improve the lead time factor in the export oriented apparel industry in Bangladesh gradually. The study aims to notify the concerned stakeholders about the consequences behind the prolonged lead time of Bangladesh readymade apparel industry in a hope that all the concerned authority will do their bit to improve the situation.

Literature review

Concept of Lead Time

As it is said, it is the amount of time required to complete a service, a production lot or an order. Lead time is inter-related with the other production management support tools.

Lead Time in Supply Chain Management:

A more conventional definition of lead time in the supply chain management realm is the time from the moment the customer places an order to the moment it is received by the customer. Lead time is imposed on the supply chain by the competitive environment of business which is driven by customer expectations, supply chain innovations and competitive pressure. Competitors that cannot deliver products and services within the established lead time will likely to perish.

Lead Time in Manufacturing:

This is the time from order start to order completion inside the factory. Another thing is customer lead time which is the time from customer order placement to receipt of goods. It is interlinked with the manufacturing lead time as to reduce customer lead time may require to reduce the manufacturing lead time first. The shipping time is included because the manufacturing company needs to know when the parts will be available for material requirements planning. It is also possible for lead time to include the time it takes for a company to process and have the part ready for manufacturing once it has been received. The time it takes a company to unload a product from a truck, inspect it, and move it into storage is non-trivial. With tight manufacturing constraints or when a company is using Just In Time manufacturing it is important for supply chain to know how long their own internal processes take.

Lead time is so made of:

- Preprocessing Lead Time (also known as "planning time" or "paperwork"): It represents the time required to release a purchase

order (if you buy an item) or create a job (if you manufacture an item) from the time you learn of the requirement.

- Processing Lead Time: It is the time required to procure or manufacture an item.
- Post processing Lead Time: It represents the time to make a purchased item available in inventory from the time you receive it (including quarantine, inspection, etc.)

Lead Time in Production Planning

In production planning, lead time is very important. Suppose, a product is made from material B and material C. Material B is made from material C. It means, if there is delay in producing or sourcing material C, there will be delay in getting material B. So, there will be delay in the production of product A. Customer will not get delivery in time. So, deadline is fixed for getting supply and production simultaneously. Suppose, 30 days is the lead time for delivery after customer places the order. It means, lead time for buying and production of material B and C should be fixed accordingly.

Lead Time in Apparel Industry

To lower the risk of a fashion miss, now days most of the retailers and apparel companies are pressing their suppliers to crank out a small order quickly—allowing them to test styles in stores—and then fill re-order requests even faster, a tactic known as chasing. This chase leads to a stressed out lead time for the apparel manufacturers.

In apparel industry, lead time is the total amount of time required for completing a product beginning from the date of receiving raw materials to the stage shippable to the customer. Total lead-time is made up of time devoted to processing orders, procuring and manufacturing items, and transporting items between the various stages of the supply chain. Lead-time typically includes two components: Information lead times (the time it takes to process an order) and Order lead times (the time it takes to produce and ship the item). An equation may be able to help us to assimilate the conception.

Total Lead Time = Information Lead Time + Order Lead Time = Information Lead Time + Manufacturing Lead Time + Shipping Time for importing fabrics & accessories + Shipping Time for exporting final product. (Islam, 2010)

Lead time is one of the main competitive factors among companies. The ability to deliver quickly influences export, sales and thereby revenue. At present, the average lead time in our RMG sector is more than 100 days while in China it ranges between 30-60 days.(Nuruzzaman, 2009)

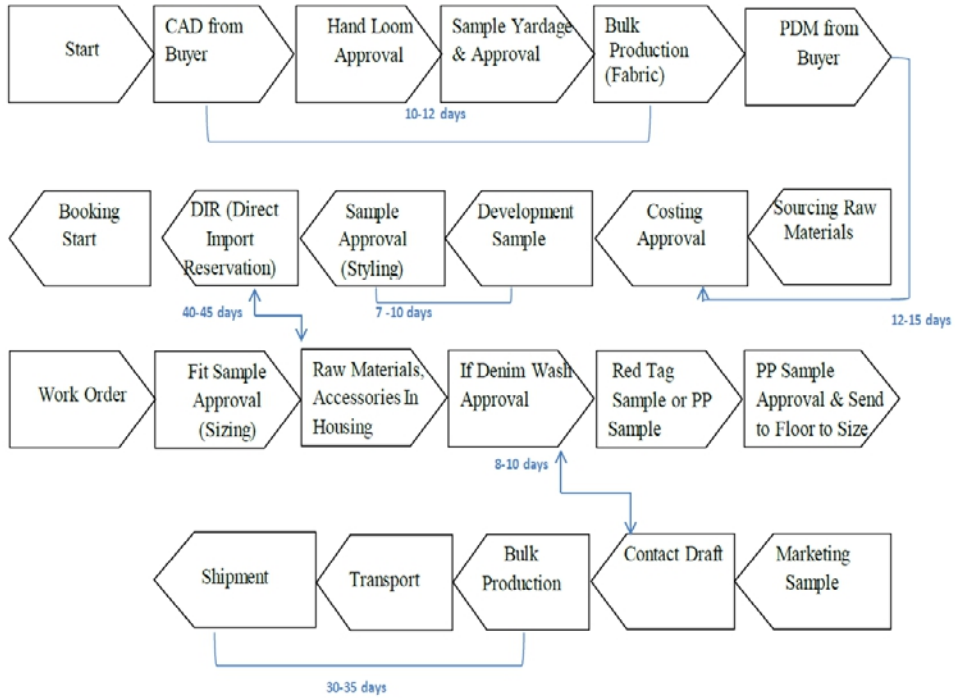


Figure 1: A Typical Order Processing and Execution System for knit apparel industry

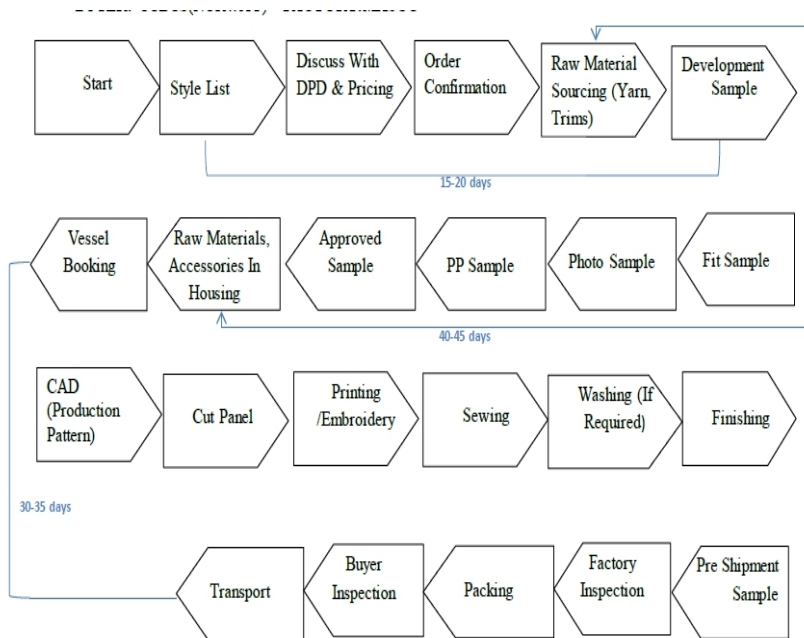


Figure 1: A Typical Order Processing and Execution System for woven apparel industry

Importance of Lead Time in Apparel Industry

Lead time, like in any other manufacturing fields, is undoubtedly one of the predominant issues in outsourcing and durable global marketing of apparel industry that largely depends on accomplishing an order within a certain elapsed time to meet the customer demands properly. The three parameters cost, quality and lead time for apparel retailers are critical but one can't deny the importance of finishing a job as early as possible since it is perhaps some buyer's requirements. The following list will throw light about the necessity of lead time.

- Product cost, quality and lead-time are correlated. Quality denotes the existence and performance of the product. However, paying high cost to get the product that exceeds the sell period converts to huge loss to the retailer.
- Fast fashion apparel is time sensitive and follow a very tight timeline and meeting the deadline is important than ever.
- Quality and lead-time go hand in hand. High quality products with simple design need shorter turnaround time compared to the embroidered or premiere fashion cuts.
- The time needed for the raw-material like fabric, trims or other accessories is important as that would define the timing of the

finished goods. Longer lead times generally tend to stock higher inventory levels for the retailers.

- Lead time reduction can lower a firm's overall costs and make it more responsive to the marketplace by decreasing the amount of finished goods inventory required.
- Lead time data is effectively a measure of the total manufacturing process. It tells how quickly raw materials can be converted into delivered product to the customer. Apparel manufacturing process is made up of many steps. Some of those involve a manufacturing process whilst many are just moving materials or product and waiting for materials or product. Having a high lead time is an indication that the process is not optimized.

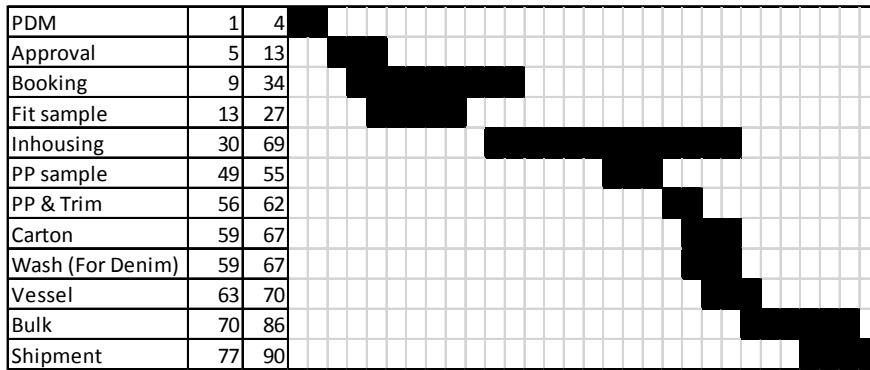
Methodology

A portrayal of the total lead time management in Bangladesh's readymade apparel industry required intensive interviews of concerned personnel in different departments. Secondary data were accumulated from different international and local research reports. Real time information was collected from renowned apparel sourcing companies in Bangladesh. Interviews were taken from industry people who have been working for years in the apparel trade. Opinions from the government policy makers and concerned authorities like Bangladesh Garments Manufacturer and Exporters Association (BGMEA), Bangladesh Association of Exporters (BAE) were cross checked to verify authenticity and realism of the collected secondary data. A survey on 15 readymade apparel industries in the two garments clusters, Gazipur and Narayanganj of Dhaka city and Chittagong (port city) were helpful to reveal the problematic areas behind the prolonged lead time. Expert's comments were also taken in formulating a strategic way-out from the problematic areas.

Results and Discussion

In the beginning of 1990s, the lead time was 120-150 days but in 2007, it was reduced by 30-50 days, i.e. at present it is 90-100 days. China requires only 30 days due to their textile and other backward linkage facilities as well as export friendly management and supporting policy. It is 45-60 days in India and Pakistan.

Figure 1: Gantt chart for a typical apparel industry with a lead time of 90 days



Problematic areas in the readymade apparel industry that affects the lead time are primarily classified in three categories:

- Development Stage
- Execution Stage
- Other Areas

Development Stage

This area comprises the order reception to the in-housing of raw materials and accessories. The obstacles in this section mainly cycles through backward linkages and buyer order processing systems.

Backward Linkage

Backward linkage industry is said to be the industry who supplies the raw materials to readymade apparel industry i.e. the primary textile industry and the accessories industry. Bangladesh has gained enough reputation for knit fabrics as most of buyers are relying on local knit fabrics to produce their apparel products from Bangladeshi apparel industries. More than thousands of knit composite apparel industry is functioning delivering final products within around 90 days whereas the average lead time in the apparel industries are more than 110 days. The international standard though is far better. The apparel industries that do not have their own backward link industry have to source fabrics from local or foreign producers which requires an extended lead time. Fabric import is a lengthy process and on average takes up to 60 days.¹In the woven sector where more than 90% of fabric is sourced from mainly China requires a lead time of around 120 days to ship the end product. In figure 1 the Gantt chart for a typical apparel industry shows that, in-housing the materials takes up to 40 days of the 90

¹ Data taken from Bangladesh Garments Manufacturers and Exporters Association (BGMEA) Research Cell

days of the lead time that is 45% of the total time. China in other hand do not comprise the burden of importing fabrics as they are rich in in-house textile solution, can ship the end product within a lead time of only 30 days.

Type of Industry	Average Lead Time
Knit Composite Industry	70-90
Knit Apparel Industry	90-110
Woven Apparel Industry	120

Table 1: Average Lead Time for different types of industry²

Buying Behavior

As an important hub for apparel sourcing, most of the apparel buyers of the world have a buying office here or carry out buying through middle-retailers. Buyer's buying behavior is also identified as one of the reasons behind prolonged lead time. Manufacturers have limited access to current market intelligence and information on international apparel trade trends. There is no specific indication from the local buying offices to the manufacturers about the next season's fashion. In most of the cases there is not any opportunity for the manufacturer to plan in advance for fabric and accessories.

Even the local buying offices are not the ultimate decision makers and approvals had to be taken on various stages of production like fit sample approval, pre-production sample approval, design approval, wash approval etc. from the headquarters. Samples are sent by air to the respective head offices and it takes much time. On various occasions, the buyer's authorized approval person is not available immediately. These problems delay the decisions to be made by the buyer and add some undesired days in the lead time. Approval process is lengthy and consumes around 10% of the total lead time. If the local buying officers were given the authority to approve samples, approval process could have been completed within 2 to 3 days whereas it takes 10 to 15 days now. Cases are also common when sudden changes in style, color or shade are regulated in the middle of the production which requires new planning, new material requirement and sourcing and new work study; leads to prolonged lead time.

Strategic sales forecasting of the renowned fashion brands are done in such a way that it allows barely any room to the manufacturers. Apparel brands want to meet the exact customer demand for the upcoming seasons. They are always in a mad race of showcasing the latest fashion trend in the market before someone else does. Doing so, they wait until the last moment to plan for the coming season and these forces them to have a little time on hand to produce the apparel. The explicit pressure applies to the manufacturers. They have to do so many things within a little time available.

² Data imported from own research questionnaire and survey

Execution Stage

Execution stage refers to the start of bulk production and receiving the final product. Though it seems as the major stage in an apparel industry, it only takes 15-20 days for the production of end product if the development of the order was executed effectively. Problematic areas that consume avoidable lead time in this stage are shown as followed.

Inefficiency in planning

Planning in the execution stage is the identification of required manpower and machines to be able to complete the production in least time. It refers to the process of determining of manpower, equipment and facilities based on the demand. The four basic manufacturing metrics used in the industry are Cost, Quality, Lead time and Technical Risk. So, inefficient planning has a great effect on those four metrics.

Backdated production system

The choice of best apparel production system should depend on the product and policies of the company and on the capacities of manpower. Bangladesh apparel sector uses the traditional progressive bundle system widely where parts of various components after being cut in the Cutting Room are tied up in bundles and distributed out to the Sewing Section as bundle form. In this system balancing a line is difficult and an efficient supervisor is needed which is not available in every industry. Planning for each batch of each style takes a lot of time. This is somewhat an ineffective practice, as production managers are unable to manage or plan the production effectively every time.

Low Productivity

In Bangladesh, workers are available in plenty but lack of skill is still a big concern here. This yields low productivity when compared with other competitive countries like China, India, and Pakistan. If China's productivity is 100, Bangladesh's productivity is only 77%. Besides, lack of investment in new machinery and technologies with current insufficient size of skilled workforce also impedes an increase in productivity. Unskilled middle management positions are also a major reason behind the low productivity of apparel industry. Most of the firms are run by people with no previous academic background of textiles or apparel. Old-fashioned technology with non-technical persons is a common phenomenon in the apparel firms.

Other Areas

Bangladesh is a developing country and still weak in infrastructure compared to international standard. Poor supply of energy and gas, transport

and port facility which are essential elements of international trade are still below part. And to add with the political instability, transport of readymade apparels to the destinations through the port sometimes becomes a lengthy process.

Weak Infrastructure

Congested roads, limited inland transport alternatives, add inefficiencies to apparel export lead time. The apparel industry is highly dependent on the Dhaka-Chittagong highway route as Chittagong sea port is the main doorway from the country. Most of the apparel industries are Dhaka and Chittagong. As a result Dhaka-Chittagong route is very important for apparel export. Currently it is a two lane road with busy traffic and a four-lane high way is under construction. 280 kilometers of road from Dhaka to Chittagong sea port takes a day long for a cargo to reach which is really inefficient. The goods laden vehicles have to stand for hours in the traffic jam on the way to Chittagong from Dhaka and its adjacent areas due to poor road facilities. Many apparel exporters complained that they cannot meet the strict lead-time set by the international buyers due to this.

Lack of deep-sea harbor

Lead time for sea freight is increased by at least a week due to the lack of a deep-sea harbor. We have to ship the products to the feeder vessel which then approaches to the mother vessel in Singapore. It takes 7 to 10 days for the feeder vessel to reach mother vessel, unload and load again. A deep sea harbor can surely eradicate those extra time for the sea freight.

Poor port facility

Productivity at Chittagong port suffers from inefficient processes. Manual processing, limited crane capacity, and strikes that sometimes span several days at a time. The facilities of Chittagong port have not increased like the export volume. The containers are kept stuck in the port for even 15-20 days though they are supposed to be released within 3 days. Poor port facility is adding up to the lead time as the import of fabrics takes a much more time to reach the factory premises due to different port complexities.

Labor unrest and political instability

Bangladesh apparel industry can supply the products at the cheapest rates as they have the cheapest labor in the offering. But there is always a pressure from worker trade unions to raise the wages periodically. And this pressure sometimes transforms into violent protests that forces factories to shut their operation. The instable political situation of the country doesn't help the cause and factories have to remain closed for weeks some times. As

a result there are cases where manufacturers seldom miss the agreed lead time with the buyers.

Proposal of a strategy for reduction of the lead time

Lead time in the Bangladesh's apparel industry cannot be reduced overnight, but if some strategic steps can be adopted it is possible to gradually reduce the lead time significantly. Immediately 30-40% (about 25-30 days) of lead time can be reduced only by proper and efficient management in the supply chain. And 15% (about 14 days) time can be avoided by only developing port facilities. Development of the textile sector is essential to reduce dependency on imported fabric. If local textile industries can supply quality fabrics to the apparel industry another 15-20 days can be alleviated easily. Solutions are proposed in three stages (immediate, mid-term and long-term) through this study and they are described below.

Immediate solutions

Solutions those can be adopted right now in the apparel industry are termed as the immediate solutions. These are concerned with the improvement and modernizing of the current production system and supply chain management in the apparel industry. Regular training of workers and application of ergonomics in the production floor should be implemented to boost productivity. Relation between buyer and manufacturer should be for long term and more open-oriented. The immediate steps that can reduce lead time considerably are described below.

Advanced production and management

Advanced production philosophies like lean manufacturing, or implementation of ERP are proved to be more productive than the progressive bundle system which is mostly used in the apparel industries.

Lean manufacturing is a Japanese famous production philosophy which is designed with several productivity tools. The tools include continuous process improvement (kaizen), the '5 Whys' and mistake-proofing (poka-yoke), the 5S, Just in Time (JIT) etc. Effective business strategy and management information systems are required for installing proper mapping and continuous wastes dictation programs. Lean manufacturing is most frequently associated with elimination of seven types of wastes from the production system which are responsible for additional lead time.

Value Stream Mapping (VSM) is another Special type of flow chart that uses symbols known as "the language of Lean" to depict and improve the flow of inventory and information. Value Stream Mapping Purpose is to

provide optimum value to the customer through a complete value creation process with minimum lead time.

After implementation of lean tools in many of the factories, results observed were highly encouraging. Some of the key benefits entail production cycle time decreased by 8%, number of operators required to produce equal amount of garment is decreased by 14%, rework level reduced by 80%, production lead time comes down to one hour from two days, work in progress inventory stays at a maximum of 100 pieces from around 500 to 1500 pieces. Apart from these tangible benefits operator multi-skilling as well as the flexibility of style changeover has been improved. Solutions provided to sample section through the Japanese 5S System application reflected as affective tool for smooth sample production and dispatch with better quality sample.

Adoption of Enterprise Resource Planning (ERP) in inventory control system is considered as a smart way to increase productivity. Smooth flow of information is essential to evade avoidable time in in-housing the raw materials. ERP enables a factory to have a common set of data that provides a complete picture of its production capacity, inventory, material, and resource availability. This helps the firm the ability to optimize their supply chain.

An integrated program for workers training is a must with proper ergonomic knowledge. Unskilled workforce is still a big problem here though the industry is more than 35 years old. Skilled workers with proper technical and ergonomic knowledge are a key in modern production systems. Good environment and ergonomically designed work systems have a huge impact on the productivity and it can significantly help in reducing the lead time of production.

Creating long term relation with the buyers

Creating long-term partnerships with buyers and leveraging them know- how in capability building is the ground on which suppliers should focus. This can include, for example, utilizing buyer know-how for capability building, long-term capacity planning/blocking, co-development of products, electronic data exchange and balancing minimum order sizes. The emergence of buyer-led global supply chains producing textiles and apparel in ever accelerating design, production and distribution cycles should be changed and relations should be more open-ended.

Mid-term solutions

The development of the infrastructure and port facilities is grouped under mid-term solutions. This is because, to improve infrastructure it is not

possible to do overnight but it is manageable if strategic steps are taken in time.

Improvement of infrastructure

Efficient transportation system could reduce the excess time needed for movement of raw materials and finished products from port to factory and vice-versa. Government of Bangladesh has undertaken a number of projects addressing the different transport routes that are being pursued to help ease the situation. Expansion of the Dhaka-Chittagong highway to four lanes, prepare long-term efforts to establish a deep-sea port in Chittagong, improve efficiency at Dhaka airport, and double the train container transport capacity can certainly help in reducing the lead time.

Improvement of port facilities

If the port facility is improved it may help to reduce lead time about 14 days. The containers must be loaded and unloaded to the ship without any delay. Turnaround time of feeder vessels in Chittagong Port is now seven to 10 days while it is two days in Bangkok and one day in Singapore. The maritime transport costs account for 14 per cent of the cost of Bangladeshi textile exports to the US, compared to less than eight per cent for countries like India, Thailand, China and Taiwan. So, improving the turnaround time and to redesign the maritime transport costs are essential. Improvement of feeder vessels and port management will certainly contribute towards improvement of lead time.

Political stability

Government of Bangladesh has to be strict about business plans & regulations. Frequent changes are to be stopped. After deciding a profitable plan is to be created & that must be followed by all the industries. For the sake of readymade apparel industry, the country's most export value earning industry, strikes should be avoided or at least on emergency export duty vehicles should be kept free off strikes.

Value added product

Being confined within basic product can be a threat for RMG industry. Fashionable garments can be produced in two ways: by using apparel washing techniques and by using accessories (like ladies items). Raw materials and accessories used for a fashionable garment can be brought by air, since its charge is much more than the basic garments. Air shipments are economically feasible for this type of products. So, there is no possibility of missing the lead time and even we could reduce the total time needed to deliver such kind of products.

Long term solutions

Long term solutions are targeted as a permanent solution for the readymade apparel industry. But it requires investment from the stake holders as those solutions can certainly provide more competitiveness when the fast fashion industry is concerned. The development of backward linkage industries which are the fabric manufacturing and finishing industries and the expansion and modernization of the prevailing port facilities are considered as the long term solutions.

Improvement of backward linkage industries

In order to reduce the lead time, strong backward linkage industries are essential. To meet the fabric demand for the RMG sector Bangladesh would be able to reduce lead time with a considerable amount. Scientific research could be done to produce cotton in Bangladesh. Spinning, weaving, dyeing and finishing mills should be erected robustly to fulfill the demand for readymade apparel sector. It will also be beneficial for the primary textile firms as they will be able to sell their goods to the local readymade apparel industries.

Deep Sea Port

In the 1960s a proposal of constructing a deep sea port in Kutubdia channel was submitted to the government, but still hasn't been materialized. Considering many facts about the whole scenario, specialists have finally selected Sonadia as the appropriate location of deep-sea port. The mother vessels that cannot enter the Chittagong port at present will anchor at the deep-sea port. The present volume of 30 billion US\$ export-import business will be doubled by 2020. Deep-sea port will play a vital role for the economic development of Bangladesh like Singapore, Hong Kong and Sri Lanka. China and other development partners have already expressed interest in helping Bangladesh regarding a building of deep-sea port.. A deep sea port will definitely reduce the lead time to a great extent.

Conclusion

An extended lead time is one of the major problems that the apparel sourcing world is facing when exporting readymade apparels from Bangladesh is concerned. Apparel sourcing bodies are one of the major stake holders of the readymade apparel trade and they along with the Bangladesh authorities can endow their investment in improving the factors affecting the lengthened lead time issue. The prevailing factors behind this are mostly related to the efficacy of the supply chain and port facility. The major back-lock in the supply chain is the incomplete support of the primary textile industries that is supposed to supply the raw materials to the readymade

apparel industries, especially fabrics. Fabrics import from abroad takes up to 60 days of the lead time which is roughly 45% of the average lead time. Improvement of the backward linkage industry to a standard to be able to support the readymade apparel industries with export quality fabrics is a continuous process and it will take some time. But the development of the production and manufacturing system can be implemented in a short while and it has a proven impact on the lead time. Buyers motive towards their suppliers should be more open oriented and decisions regarding sample approvals should be more efficient. Port facilities are only a question of time; as the export market is expanding, investors will be more attracted to develop the Chittagong port to an international level. Development of Bangladesh as a major readymade apparel exporter, certainly 'the next China', will definitely be fruitful for both the manufacturers and buyers to explore in the global fast fashion industry with confident and competitiveness.

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