The Transition from Acrylic Raw Yarn to Natural Cotton in the Textile Sector: A Status of Bangladesh

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Abstract

The global textile market is experiencing a substantial transformation due to the increasing need for sustainable substitutes for natural cotton. Due to changing global market preference, buyers demand, and growing environment conscious it is being considered for the country to switch from acrylic raw yarns towards natural cotton. This article examines how Bangladesh is currently moving from acrylic raw yarn to natural cotton in response to the changing global market. This study used both qualitative and quantitative data. The qualitative data collected through interviews and visits in the 6 factories support the quantitative findings. This shift provides the opportunity for innovation, green technology investment, and long-term financial gains. Challenges remain with the cost of sustainable cotton, supply chain interruptions, the requirement to develop infrastructure, maintaining the standard of international certifications, and educating employees. To satisfy buyers' demands for sustainability and transparency, the change is speeding up supply chain reorganization and manufacturing renovations. Bangladesh could be at the front of sustainable fashion, which is standing in such a position that its ramifications on the environment, market value, and economic feasibility are going to be high. The study also explains the short-term and long-lerm repercussions of export-oriented factories, over-dependence on foreign cotton, and the environmental and social trade-offs involved.

Keywords: *Textile industry, natural cotton, acrylic raw yarn, sustainability, ready-made garments (RMG), Better Cotton Initiative, supply chain, environmental impact, market competitiveness, sustainable fashion, Green Technology.*

1. Introduction

The prospective global demand for sustainable textiles has led to a substantial change in the supply chain of the Bangladesh textile industry. Buyers within major export countries such as the EU, North America, and other developed regions increasingly demand garments produced from natural fibers like cotton (which is a biodegradable, sustainable, and eco-friendly fiber) rather than synthetic equivalents, i.e., acrylic yarn (Smith, 2020; Green & Liu, 2021). The realignment of the supply chain is crucial to fulfill buyers' requests and to keep Bangladesh's competitiveness intact in the global RMG market. This is not only out of market demand, but there is also an opportunity for Bangladesh to position itself as a leader in sustainable garment manufacturing (Johnson, 2021).

As the world's centerpiece of Textile production and export, Bangladesh has its own difficulties and potential to shift from acrylic raw yarns to rich cotton ones. The decision is made with the increased demand from domestic and international markets for

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environmentally friendly textiles, along with regulatory pressure across sectors (Wang et al., 2018). The RMG industry is one of the major export contributors to Bangladesh; more than 80% of the total export comes from this sector (Bangladesh Export Promotion Bureau, 2021). Traditionally, the woven segments in the Bangladeshi textile sector have been dominated by synthetic fiber (for example, acrylic) and polyester for cost reasons and due to the nonavailability of domestically manufactured synthetic fiber (Nuhan et al., 2024). The demand for man-made fibers is falling as customers become more interested in sustainable and Earth-friendly options (Jones & Taylor, 2019).

More than 90% of cotton, which is the main raw material for those mills in Bangladesh, comes from foreign sources like the USA, India, Brazil, Uzbekistan, etc. (International Cotton Advisory Committee [ICAC], 2020). Natural cotton is slowly increasing market share as international buyers prefer natural clothing. Several factories are investing in infrastructure to process and produce products from wild cotton (Henderson, 2019). More and more textile producers are getting certificates such as GOTS certification or BCI, in order to correspond with the global sustainable requirements. Buyers request certified supply chains because of traceability and assurance of environmental as well as ethical standards (Clark, 2021; BCI, 2022).

In response to current market demands, the Bangladeshi textile sector needs to follow sustainable strategies and adapt to these emerging needs to withstand the markets' on demand and ensure sustainable success in a fast-moving global economy (Lee et al., 2020).

2. Research Question

How far is shifting from acrylic raw yarn to natural cotton feasible in the context of buyers' requirements, cost efficiency, and environmental requirements?

3. Objectives of the Study

Major objectives of the study are as follows:

i. To judge the environmental factors behind the shifting from acrylic raw yarn to natural cotton in the textile industry during 2014-2024.

ii. To focus on the industry standards, emphasize ethical sourcing, sustainable practices, and cost-efficiency in the changing approaches.

iii. To identify the major implications of such shifting, along with the challenges and prospects thereon.

4. Hypothesis

H1: The transition from acrylic yarn to natural cotton in Bangladesh is mostly due to buyers' demand, environmental and market factors, significant policy changes, and worldwide certifications, to make the textile industry more competitive and sustainable.

5. Need for the Study

Synthetic fiber demand is dropping as buyers turn their attention to eco-friendly and sustainable substitutes. Certified supply chains are becoming popular with buyers in order to

ensure traceability and compliance with ethical and environmental norms. Meeting buyer needs and preserving our competitive advantage in the global textile market depend on this supply chain reassessment. In addition to being a reaction to market changes, this change offers the chance to further establish itself as a pioneer in the production of sustainable garment manufacturing.

The market of artificial fibers was decreasing, and as a result, consumers are longing for ecological alternatives to what brought significant changes to the textile industry around the world. The world eco-fiber market was estimated at $52.8 billion in 2022 and is forecasted to grow at a CAGR of 7.5% from 2023 to reach $108.6 billion by 2032, and it represents an excellent example (Allied Market Research, 2023).

"This transition is met by buyers recognizing certified supply chains that guarantee traceability and compliance with environmental and ethical standards as being more valuable. In order to maintain the leading position and fulfill these changing customers' demands, Bangladesh needs to revisit its supply chain in the global textile market (Kumar et al., 2020).

In order to properly gain insight into the challenges and implications as well as the prospects of practicing sustainability, this research is significant in its contribution towards investigating the dynamics according to the sustainable supply chain practice context within our textile sector (Uddin & Rashid, 2023).

6. Conceptual Framework of the Study

The textiles space is undergoing a change due to environmental concerns, changing consumer preferences, and sustainability measures. Manufacturers' move from an acrylic raw yarn, a synthetic fiber derived from petrochemicals, to cotton – a renewable and biodegradable resource – comes with both benefits and challenges. This schema describes the main features responsible for this transition.

6.1 Drivers of Change

Environmental issues address carbon footprint, biodegradability, waste management, and energy and water usage during production (Smith & Lee 2020).

Eco-friendly and Sustainable Consumer Preferences are the keyword; comfort, and breathability of cotton vs. acrylic; health issues associated with synthetic fibers (Johnson, 2021).

Regulatory and compliance pressures include sustainability government policies, microplastic pollution from synthetic fibers limitations, as well as certification and eco-labeling standards (e.g., GOTS, OEKO-TEX) (Smith & Lee, 2020).

Macro-economic or market influences are: Raw material/pricing changes (acrylic versus cotton); National and international trade policy impacting imports/exports of fibers; Ride impacts for sustainable textiles investments (Wang et al, 2018).

6.2 Challenges and Considerations

Production and processing adaptation refers to the adjustment of machinery and technology used in cotton yarn processing, variations in dyeing and finishing processes, as well as training workers when working with natural fibers (Jones & Taylor, 2019).

Supply chain adaptation includes sourcing practices that will increase reliability, and sustainability in cotton suppliers, in the management of price volatility in the cotton market, leading to intelligent pricing as well as ethical labor employment by manufacturers of cotton (Brown & Green, 2019).

Product performance, and quality control hinge on the variation in durability, stretch and texture mixing the options, e.g., cotton-poly blends for improved properties, as well as consumer education about the care of cotton fabrics and longevity (Wilson et al., 2018).

6.3 Outcomes and Impact

Environmental impact reduction relates to the lower carbon footprint and reduced plastic waste, improved sustainability of textile products, and enhanced circular economy practices like recycling and biodegradability (Clark, 2021).

Market competitiveness and brand positioning relate to differentiation through eco-friendly branding, increased consumer trust and loyalty, and expansion into sustainable fashion and ethical textile markets (Smith & Lee, 2020).

Economic Viability and Profitability cover the long-term cost savings from sustainable investments, the potential for premium pricing due to eco-friendly appeal, and strengthened supply chain resilience against regulatory changes (Wang et al., 2018).

7. Methodology Followed

The study interviews five officials from each of the sample companies, adhering to its objective. Focus is mostly directed at the Bangladeshi supply chain, specifically concerning the procurement of raw materials for the textile industry. The study also relies on secondary data and published sources regarding companies' consumption and the procurement of raw materials, including statistics from NBR, BTMA, EPB and as well as many international journals, articles, reports and literature, etc. Primary data have been collected from those sample companies using an interview schedule. The qualitative data collected through interviews and visits were used to support the quantitative findings, providing context and explaining the challenges thereon.

8. Review of the Related Studies Done Earlier: Research Gap

Acrylic fiber is a synthetic polymer derived from acrylonitrile; a chemical obtained from fossil fuels. Research reveals that acrylic yarn production significantly results in higher carbon emissions from a textile mill focused on wool and acrylic fiber manufacturing, subsequently involving dyeing procedures (Ozturk et al., 2015); non-biodegradability causing microplastic pollution in waterways (Browne et al., 2011); and increased energy consumption during manufacturing relative to natural fibers (Chen et al., 2021). Cotton, a natural fiber,

decomposes readily, hence diminishing the environmental impact of textile waste. Cotton production raises environmental issues such as sustainability of water and pest control (Chapagain et al., 2006).

Moving from acrylic to cotton is a pretty major adjustment of sourcing and cost. There is evidence that acrylic fibers are commonly cheaper to produce resulting from industrial scale petroleum-based production (Wilson et al., 2018). Cost of cotton is seen as risky, which is driven by weather and labor costs and rules within international trade (Global Market Report, 2023). Domestic and sustainable organic production of cotton has an increasing trend, in spite of the huge investments as well as following certification standards (OECD, 2021). Despite the additional costs, companies investing in sustainable cotton benefit from price premiums and strong consumer loyalty (Hansen & Schaltegger, 2018).

A recent research reports on how buyer preferences are evolving toward sustainable fashion and green materials. Electronic Inspection Copy available for instructors here. The fashion industry is currently one of the most unsustainable on the planet. Younger consumers, in particular Generation Z and Millennials, show high preference for ethical sourcing, environmental sustainability, sustainability of the fashion sector as a whole (Kozlowski et al., 2015). Consequently, companies that adopt sustainable cotton and responsible sourcing are likely to have a competitive advantage if they align their strategies with changing consumer values.

However, cotton has unique sustainable advantages but there are still problems related to is it cost, production adaptive capacity, fiber performance etc., the technical innovation and sustainably sourcing and strategic market orientation upgrading should be encouraged. More research is needed to improve the eco-properties of cotton through organic production as well as other bio-based fiber options.

9. Major Findings and Observations

The following are brief descriptions of the sample units, extracted directly from organizations through interviews with their representatives.

ABC Textiles, a big garment manufacturer in Bangladesh, switched from acrylic raw yarn to cotton because of European brands' demand. By partnering with organic cotton producers in India, and investing in low-impact dyeing technologies, the company entered into long-term contracts with top fashion brands under two years, acquired GOTS (Global Organic Textile Standard) and BCI (Better Cotton Initiative) certifications, saved 30% of water consumption through state-of-the-art processing technology and see a 25% increase in exports in its eco-friendly product offerings.

Queen South Textile Mills Limited, the company has established its factory at DEPZ, where it operates as a 100% export oriented backward linkage textile industry which produces and markets various types of knitted, dyed and finished yarns include cotton nylon polyester viscose carded combed cotton acrylic etc. in a single segment business. They import yarn monthly in tones from big factories of Pakistan, India Indonesia and Vietnam. Equipped with

a variety of modern dyeing machines, to produce from 80,000 pounds to 130,000 pounds per day. Top level European water purification systems, radio frequency dryers and air-splicer winding machines keep the color and yarn quality clean with no knots.

Daeyu Bangladesh Ltd., a South Korea based multinational corporation is engaged in producing spinning, and dyed yarn. The company wants to switch production from acrylic yarn to natural yarn. Union Group, which also owns the natural cotton factory Sam Ree Dyeing, is running the factory.

SamRee Hanks Dying Unit is full-fledged export-oriented Hank dyeing plant with capacity of 45-50 ton (metric) per day. Sam Ree is renowned for their unique hand dyeing method. Color is absorbed better for yarn with a softer, fuller feeling. The hanks of yarns are loosely arranged to hang on a bar and placed under the dye in a dye bath. Once the shade is obtained, the yarn is steamed to complete the dyeing process.

Sam Ree Cone Dyeing Plant is a complete Export oriented high pressure high temperature cone dyeing plant with impressive production capacity 85-90 metric tons per day. Sam Ree Dyeing has a state-of the art laboratory, and computerized automatic dispensing system. Sam Ree Dyeing provides state of the art manufacturing facility in such a competitive industry. Years of success, and innovation have made it one of the top suppliers in the industry.

Nice Cotton Ltd. is a private limited company founded at the end of 2007. It is a 100 per cent export-oriented natural cotton dyeing industry, which has provision for dyeing varieties of yarns and cottons. The facilities are fitted with the most advanced dyeing preparation, finishing and auxiliary equipment. The project has a capacity to produce 80 metric tons per day. The company is the newest addition to yarn dyeing. Some-of- these- were-experts foreign and local companies towards the realization of action plans with a desire to support policy which had done to accelerate based company customer satisfaction.

10. Focusing on Shifting

Bangladesh's textile sector consists of yarn, fabric and dyeing-printing-finishing mills, contributing over 13% to the GDP of the country (Bangladesh Textile Mills Association (BTMA), 2025). BTMA is the foremost national trade body of yarn and fabric manufacturers and textile product processors in the country. Fig. 1 in details:

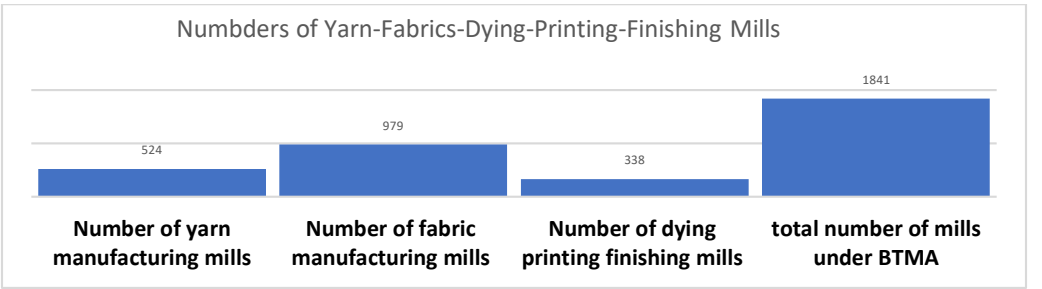


Fig 1 Textile Sector in Bangladesh, 2024

The BTMA report added that local textile mills meet about 85% demand for knit fabrics and some 40% of the demand for woven fabrics, leaving the rest to be imported.

According to BTMA data, Fig. 2 plots the potential of Bangladeshi textile in 2024. Number of spinning mills and capacity from cotton consumption is also increasing. Bangladesh has a potential consumption of around 15 million bales and is currently consuming 9.15 million bales of raw cotton per annum.

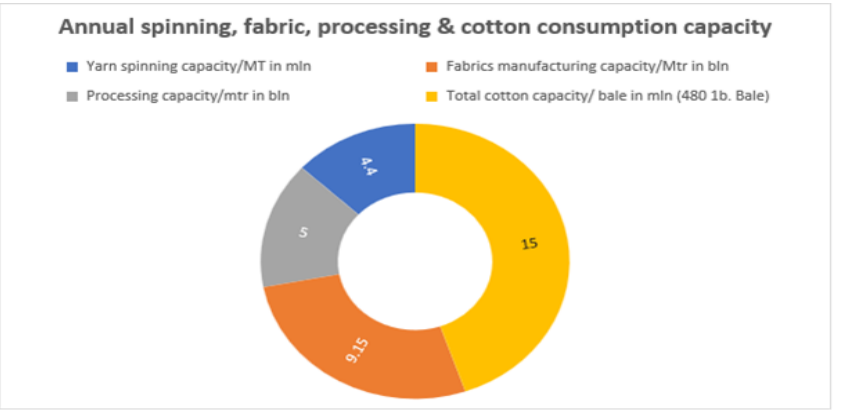


Fig 2 Textile Sector in Bangladesh, 2024

10.1 Yarn Imports Fall

Bangladesh is need of imports yarn to meet domestic demand. India, Indonesia, China, Turkey and Pakistan are the main exporting countries of yarn. Yarn imports drop by 8.5% in 2022 Trade Data Monitor,LLC (TDM) said that $1.9 billion worth of yarn was imported into Bangladesh in calendar year 2022 down by 8.5 % compared to the previous year. China and Pakistan also are the major sources of yarn imports when India raised its share to 74 percent in 2022 (Figure 3).

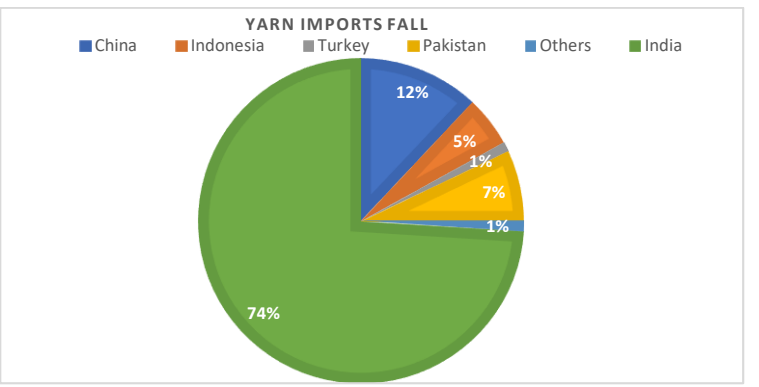
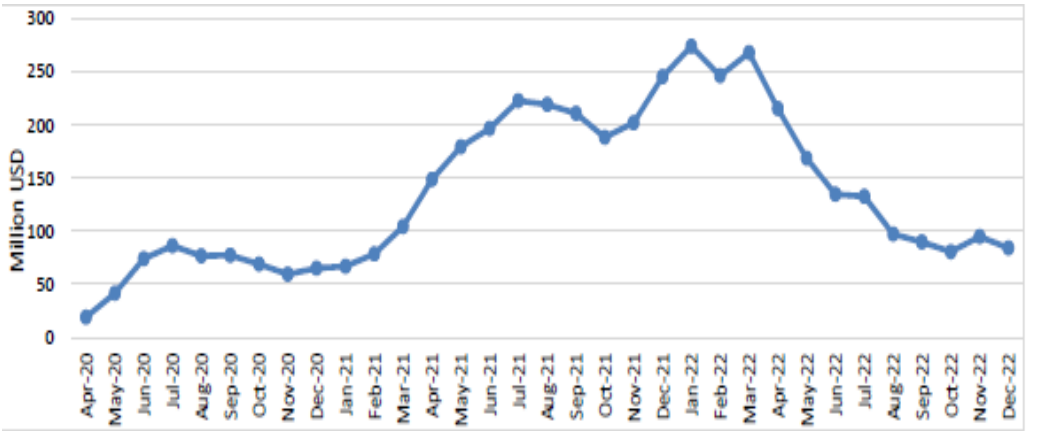


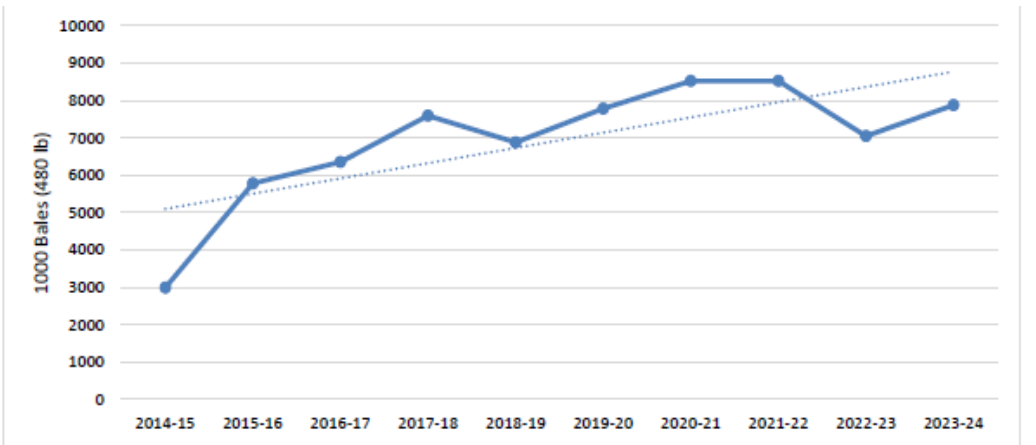
Fig 3 Bangladesh's Yarn Imports in CY 2021 and CY 2022, Source: TDM

Yarn imports started to increase in Jan 2021 and continued until mid-2022 (Figure 4). Then, with increasing domestic demand for natural cotton and imported fabrics, yarn imports gradually declined.



Source: TDM

Fig 4 Bangladesh Yarn Imports From Apr 2019 to Dec 2022



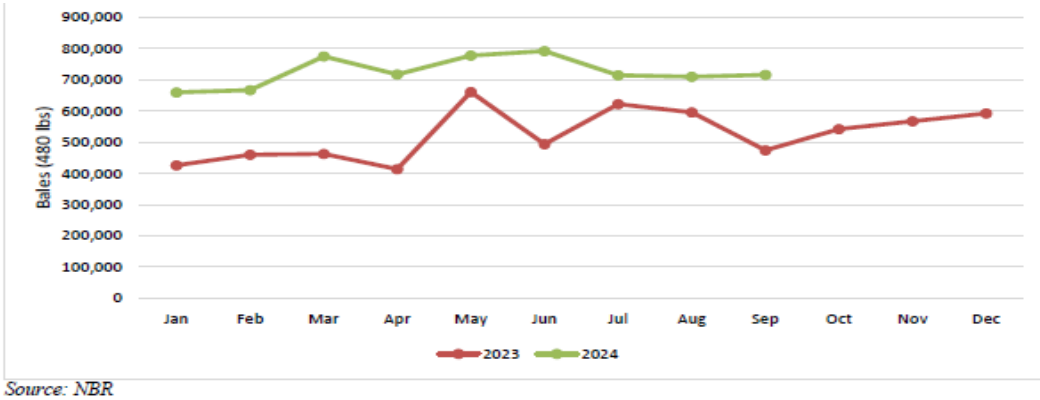
Source: NBR

Fig 5(a) Bangladesh's Cotton Imports by the year [2014-2024]

10.2 Cotton Imports Rise

According to statistics from the National Board of Revenue (NBR), raw cotton imports are expected to reach 8 million bales [as mentioned in figure 5 (a)], reflecting a 1.6% increase from the year 2023/24, due to enhanced utilization of raw cotton by the spinning sector.

Cotton imports for the year 2023/24 are 12% greater than the 7.04 million bales imported in the year 2022/23 [Figure 5 (b)].



Source: NBR

Fig 5(b) Bangladesh's Cotton Imports by Month in 2023 and 2024

In the year 2023/24, India emerged as the predominant provider of cotton to Bangladesh, exporting 1.79 million bales and commanding a 23% market share. Brazil possessed the second-largest market share at 16%, providing 1.29 million bales of cotton, followed by Benin at 12% (932,000 bales) and the United States at 9% (719,000 bales) (Figure 6, Source: NBR).

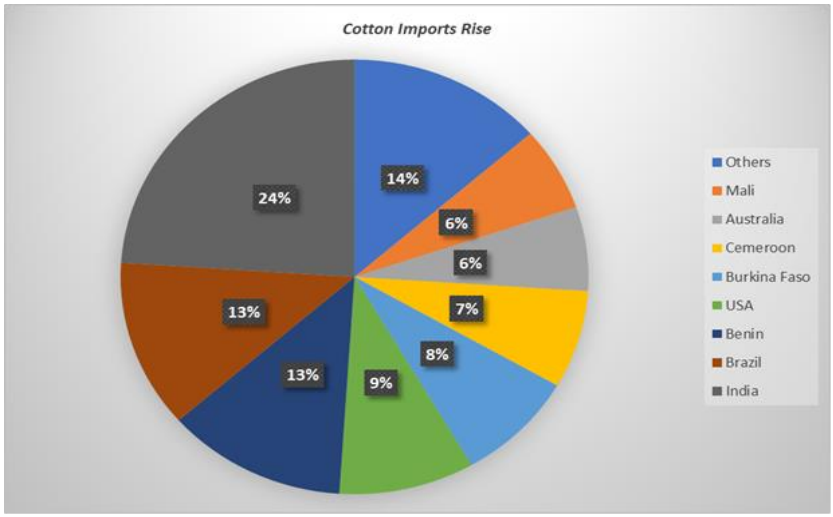


Fig 6 Country's supplier Cotton Market Share in 2023/2024 (Quantity)

10.3 Cotton yarn imports rose 39% in 2024

Cotton yarn imports of Bangladesh has risen sharply in recent time as its demand from the country's garment sector is increasing. Imports of Cotton Yarn for Domestic Consumption.

The import of cotton yarn for domestic consumption cost USD 2.28 billion, which increased by 39% in comparison to the previous years. Fabric imports for knitwear producers also rose drastically by 38% with an equivalent additional outlay of USD 2.59 bn (Hossain, R. 2025). Overall cotton imports are now forecast to be over 9 million bales, as local shirt exporters have ramped up demand despite the global supply chain being affected by COVID-19.

10.4 Differential: Shifting from Acrylic Yarn to Cotton Yarn [By Country]

China

Acrylic fiber (AF) has been one of the major synthetic fibers consumed in China, particularly for winter dress and home textiles. Recent researches also indicate that there is a structural change alerting towards natural fibres, with most of the big textile clusters adopting cotton and recycling cotton at a rapid pace. Policy stimulation and sustainability initiatives have promoted the integration of environmentally friendly cotton cultivation into industrial processes (Shen, Patel, & Li, 2020; Liu et al., 2022).

India

India, on erstwhile the textile industry is using acrylic fibres in certain segments like knitwear and blanket. Cotton is definitely dominating Textile Industry in India, as it is has been increasingly promoting cotton textiles manufacturing and refining with a vision of raw material for textile being cotton. The share of organic cotton has been rising, driven mainly by the ability to grow it domestically and demand generated for export due to sustainability (Kozlowski et al., 2015; ICAC, 2020).

Bangladesh

EVERY CLOUD HAS A SILVER LINING Acrylic yarn has been a small part of Bangladesh's knitwear and winter wear exports since time immemorial. But demands in the export market —including from European consumers — has resulted in a major shift toward cotton clothes. More recently, in the last two decades or so it has been reported that cotton is the major fibre used in garment industry of Bangladesh including sustainably produced and certified cotton enhancing competitive position of Bangladesh as a supplier in international markets (Islam & Hossain, 2022; Lee et al., 2020).

Vietnam

Vietnam's textile before depended much on acrylic fibres for sportswear’s and seasonal wears. Manufacturing companies around the globe are adopting natural fibres such as cotton in response to global environmental standards and consumer demand. This transformation has played a key role in facilitating Vietnam’s economic linkages within sustainable global value chains (Goworek et al., 2018; Liu et al., 2022).

Turkey

Turkish textile industry used acrylic fibers on carpet and rugs historically. Export based concerns are increasingly shifting their focus on cotton and cotton blended items reflecting new market sectors from around the world where the requirement of eco-garments is increasing. Scholarship indicates a strategic repositioning in Turkey is occurring from commodity to eco-efficient high value textile exports (McNeill & Moore, 2015; ICAC, 2021).

European Union

Acrylic fibers Historically, acrylics have been used in certain higher end applications such as knitwear and upholstery within the European textiles industry. However, stringent environmental regulations and sustainability targets have generated a substantial move towards cotton and other natural fibers. Study has indicated that currently cotton textiles become the dominant textiles in EU garment markets due to regulation enforcement, consumer consciousness and eco-labelling requirements (Goworek et al., 2018; Shen et al., 2020).

Emerging Trends in Cotton Utilization

Global consumption of organic and recycled cotton has jumped significantly in recent years. It is supported by academic studies that the usage of organic cotton has been experiencing a rapid growth, at least in India, China, and Turkey and there is also increasing integration of recycled cotton for sustainable effects or increased circularity within textile supply chains (Kozlowski et al., 2015; Shen et al., 2020).

10.5 Purchasing program used by buyer to do everything within the current change period

Buyers are aligning their buying with sustainability goals — such as the United Nations Sustainable Development Goals (UNSDGs).

- Acrylic as an example, of synthetic fibres contributes to environmental pollution (microplastic) and natural cotton is biodegradable (Akyildiz et al., 2024).
- The weaving of synthetic yarn by chemical methods causes environmental pollution (Ellen Mac Arthur Foundation, 2017).
- Switching to organic cotton will help reduce its environmental footprint. (Textile Exchange, 2023).
- Switching from conventional to organic or more sustainably farmed cotton can markedly alleviate ecological burdens (Kozlowski et al., 2015).
- The preference of consumers for sustainably sourced and ethically made fabrics are prompting sourcing towards natural fibers, with transparency and traceability as expectations. Cotton has the added advantage in that is more breathable than acrylic, making it desirable to individuals who live in warmer climates (McNeill & Moore, 2015).
- Environmental regulations in key markets in terms of carbon taxes and requirements for eco-labeling have made also green fibers attractive to firms (Goworek et al., 2018). Certification which are becoming increasingly important for suppliers to attract trade include GOTS and BCI.
- The increase in consumer's purchase of organic and environmentally friendly cotton, some firms have re-shaped their supply chains; changed production processes improved sourcing strategies, infrastructure and it has also included training employees (Kozlowski et al., 2015). But there are also challenges which need to be considered —

especially the cost of production, and the dependence on imported cotton, which may have implications for supply chain resilience.

11. Respondents' Views

Most of the respondent's replied that they think environmental issues (carbon emission, pollution), market demand for sustainable products, following international certifications (BCI, GOTS), cost-effectiveness, branding name are determining factors in shifting from acrylic raw yarn to natural cotton. They also think that Bangladesh traditionally maintained the use of synthetic fibres, as they are relatively cheaper and easier to obtain, durable as well as less risky in production. According to most of the respondents, the major impediments in switching over to cotton are increased cost, unorganized sourcing channels, consistency issues with regard to quality and technological or infrastructural limitations.

The main benefits are increased export competitiveness, achievement of sustainability needs, cost reductions over the long term and improved brand profile. Most of the responders advocate for subsidies for cotton importers and spinners, trade agreements with cotton-exporting nations, tariff modifications for synthetic fibers, and incentives for eco-certifications supported by both short-term and medium-term action plans. They also support a stronger policy and regulatory framework to enable a more seamless transition.

Table 1 Respondents' views frequency. The respondents' opinions were gathered in accordance with a few theories, such as institutional theory, resource-based views, and stakeholder theory.

Total Number of Respondents 30		Frequency	Percent	Valid Percent	Cumulative Percent
1.The main drivers of shifting from acrylic to cotton are (select all that apply): Environmental concerns, market demand for sustainable products, compliance with global certifications (BCI, GOTS), cost efficiency, brand reputation etc.	No	5	16.7	16.7	16.7
	Yes	25	83.3	83.3	100.0
2. Global certifications like BCI and GOTS are very important in influencing this transition.	No	5	16.7	16.7	16.7
	Yes	25	83.3	83.3	100.0
3. The period 2014 to 2024 is appropriate for assessing environmental factors in this transition.	No	5	16.7	16.7	16.7
	Yes	25	83.3	83.3	100.0
4. Ethical sourcing and sustainable practices are critical for competitiveness in Bangladesh's textile industry.	No	2	6.7	6.7	6.7
	Yes	28	93.3	93.3	100.0
5. Overall, the shift from acrylic to cotton will have mostly positive implications.	Yes	30	100.0	100.0	100.0
6. Historically, Bangladesh has relied on synthetic fibers because of: Lower cost, Easy availability, High durability of synthetic fibers, and Lower production risks.	Yes	30	100.0	100.0	100.0
7. Factories are upgrading infrastructure to process natural cotton.	No	2	6.7	6.7	6.7
	Yes	28	93.3	93.3	100.0

8. In recent years, yarn imports have increased significantly.	No	3	10.0	10.0	10.0
	Yes	27	90.0	90.0	100.0
9. The primary challenges in shifting to cotton are higher cost, limited supply chain reliability, quality consistency issues, technological/infrastructure limitations.	No	5	16.7	16.7	16.7
	Yes	25	83.3	83.3	100.0
10.The main benefits of shifting to cotton are: higher export competitiveness, meeting sustainability demands, long-term cost savings, improved brand image etc.	No	3	10.0	10.0	10.0
	Yes	27	90.0	90.0	100.0
11. Technologies like blockchain and IoT can improve transparency in supply chains.	No	5	16.7	16.7	16.7
	Yes	25	83.3	83.3	100.0
12. Most effective policy support for this transition would be: subsidies for cotton importers/spinners, trade agreements with cotton-exporting countries, tariff adjustments for synthetic fibers, and incentives for eco-certifications.	Yes	30	100.0	100.0	100.0
13. The most urgent action plans are required for Short-term, Medium-term, Long-term.	No	5	16.7	16.7	16.7
	Yes	25	83.3	83.3	100.0
14. Stronger policy and regulatory frameworks will facilitate a smoother transition.	yes	30	100.0	100.0	100.0

Source: Author Developed

So, by considering the views of the majority of respondents, the hypothesis that "The transition from acrylic yarn to natural cotton in Bangladesh is mostly due to buyers' demand, environmental and market factors, significant policy changes, worldwide certifications, to make the textile industry more competitive and sustainable" is accepted.

For Buyers

- Assurance of ethically and sustainably sourced products.
- Alignment with their sustainability goals and market differentiation.

For Bangladesh

- Strengthened global reputation as a leader in sustainable textiles.
- Enhanced brand reputation through sustainable practices.
- Alignment with global trends in eco-friendly textiles.
- Access to premium markets offering higher profitability.
- Reduction in environmental impact, contributing to the global fight against climate change.
- Potential cost savings in the long run through energy-efficient processes and better resource management (UNCTAD, 2021).

12. Challenges and Mitigation Strategies (Major Implications)

Major Challenges	Probable Solutions
1. High cost of natural cotton.	Long-term contracts with suppliers and hedging against price volatility.
(FAO-Food and Agriculture Organization of the United Nations 2020) and (Paradigm Futures 2023)	
2. Limited domestic cotton production.	Pilot farming projects, and partnerships with agricultural experts.
(ICAC-International Cotton Advisory Committee 2021)	
3. Water-intensive processing.	Invest in water-saving dyeing and processing technologies.
(Better Cotton Initiative-BCI 2022) and (TD Sportswear 2023)	
4. Compliance with buyer's certifications.	Adoption of GOTS, BCI, and similar international standards.
(Global Organic Textile Standard -GOTS 2023)	
5. Supply chain complexity.	Use digital transformation, like blockchain, to streamline and enhance traceability.
(Cotton Incorporated 2017) and (New York Federal Reserve 2019)	

13. Conclusion

The Bangladeshi textile industry is shifting from acrylic raw yarn to natural cotton because consumers are becoming more concerned about sustainability. While problems such as cost and the need to adapt infrastructure would seem to present jarring challenges, this move is essential because of long-term benefits such as growing market share, fostering a stronger reputation and exposing an organization to new ideas. If it reimagines and revamps its supply chain, Bangladesh could not only set itself up as a leader in the textile sector on the world stage but also ensure that happens responsibly for the environment.

The shift towards natural cotton will allow sustainable textiles to break into high-end EU and North American markets, as demand for organic and Fair Trade-certified products is growing substantially. The switch to natural cotton will allow them to produce higher-quality products, such as luxury clothing and home textiles. Making Bangladesh a lead player in sustainable textile production will give it an international reputation boost. Scene Shop With natural cotton and local jute fiber, alternative, sustainable textiles can be made.

Blockchain technology may be applied to increase the transparency of cotton sourcing as well as production and introduce monitoring solutions based on IoT for logistics and storage.

We get to employ AI and data analytics for demand forecasting, and optimizing the supply chain.

A significant opportunity lies in the global demand for eco-friendly, sustainable textiles. EU and NA brands also focus on sustainable sourcing which is equally in consonance with Bangladesh's RMG sector. Natural cotton felt represents a shift to higher-value production for Bangladeshi manufacturers, who can make organic and Fair Trade-certified clothing from it. Expanding into household textiles, such as bed linens and soak towels, woven from organic cotton too. What is needed Blockchain technology to increase the transparency in cotton procurement, using natural cotton combined with regionally-available fibres like jute to create new sustainable textiles.

14. Policy Recommendations

Conclusion from the above, tax policy interventions are justified.

14.1 Policy and Regulatory Support

- **Trade Agreements:** Secure lower import tariffs under FTAs or regional trade schemes for cotton.
- **Encouragement:** Offer mills that buy eco-friendly technology subsidies or tax breaks. Use government incentives and subsidies for the greening of textiles.
- **Research & Development Investment:** Support research to develop water-efficient methods for growing and processing cotton. Work with development groups to promote sustainable agriculture and industry.

14.2 Action Plan

14.2.1 Short-Term (1-2 Years)

- Identify key buyers demanding natural cotton and align supply chains accordingly.
- Upgrade spinning and dyeing facilities to handle natural fibers efficiently.
- Begin collaborations with certified cotton suppliers.

14.2.2 Medium-Term (3-5 Years)

- Establish partnerships with global buyers for long-term natural cotton sourcing projects.
- Expand the adoption of sustainability certifications across the value chain.
- Diversify product offerings with innovative cotton blends.

14.2.3 Long-Term (5+ Years)

- Build an independent supply chain with a combination of domestic cotton & strategic imports.
- Bolster Bangladesh as a worldwide center of environmentally-friendly and sustainable textiles.

15. Limitations of the Study

The following are accounts of the major practical limitations encountered.

Statistics No reliable and updated statistics of natural cotton production and consumption are available for Bangladesh. What data is now available is often fragmentary, and some government reports fail to provide hard numbers on the transition from synthetics to natural fibers. This complicates the presentation of a comprehensive analysis.

References

Akyildiz, M., Demir, H., & Yildirim, S. (2024). Environmental impacts of natural versus synthetic textile fibers: A comparative study. Journal of Cleaner Production, 415, 137986.

Allied Market Research (2023) Eco fibers market: Global opportunity analysis and industry forecast, 2023–2032. 'Eco Fibers Market Expected to Reach $108.6 Billion by 203' https:// www.alliedmarketresearch. com/eco-fibers-market-A63077

Bangladesh Export Promotion Bureau (2021) 'Annual report on RMG exports' Dhaka: BEPB.

Bangladesh Textile Mills Association (BTMA). (2025, September 16). https://btmadhaka .com/

Better Cotton Initiative (2021-2022) 'Global sustainability standards and Water stewardship in cotton production'https://bettercotton.org

Browne et al., (2011), 'Accumulation of micro plastic on shorelines worldwide: sources and sinks' Environmental Science and Technology 45(21):9175-9

Brown, K., & Green, M. (2019) 'Labor Practices in Cotton Production: Global Ethical Standards' Journal of Agriculture and Society, 12(3), 134-150.

Chapagain et al., (2006) 'The water footprint of cotton consumption: An assessment of the impact of worldwide consumption of cotton products on the water resources in the cotton producing countries' Ecological Economics, Volume 60, Issue 1, 1 November 2006, Pages 186-203

Chen et al., (2021) 'Circular Economy and Sustainability of the Clothing and Textile Industry' Materials Circular Economy (2021) 3: 12, https://doi.org/10.1007/s42824-021-00026-2

Clark, P. (2021). 'Circular economy practices in the textile industry' Sustainability Journal, 45(5), 300-320.

Cotton Incorporated. (2017) 'Advanced cotton futures and options strategies' Cotton Incorporated. https://www.cottoninc.com/wp-content/uploads/2017/03/Advanced-Cotton-Futures-and-Options-Strategies.pdf

Ellen Mac Arthur Foundation, (2017) 'A new textiles economy: Redesigning fashion's future;. https://content.ellenmacarthurfoundation.org/m6d5071bb8a5f05a2/original/A-New-Textiles-Economy-Redesigning-fashions-furure.pdf

FAO (Food and Agriculture Organization of the United Nations). (2020) 'The cotton market: Supply, demand, and price volatility' FAO. https://www.fao.org/3/cb1843en/cb1843en. pdf

Global Market Report, (2023), 'Cotton Prices and Sustainability, Sustainable Commodities Marketplace Series' Market Overview, January 2023

Global Organic Textile Standard (GOTS). (2023) 'Understanding GOTS certification for textiles' https://www.global-standard.org/

Green, J., & Liu, T. (2021) 'Reducing the carbon footprint in textile manufacturing' Environmental Studies Review, 34(2), 112-130.

Goworek, H., Hiller, A., & Fisher, T. (2018). Sustainable supply chain management in the textile industry: The role of regulations and certifications. International Journal of Production Economics, 200, 1–12.

Hansen & Schaltegger, (2018) 'Sustainability Balanced Scorecards and their Architectures: Irrelevant or Misunderstood?' July 2018 Journal of Business Ethics 150(4):937–952

Henderson, M. (2019) 'Infrastructure upgrades for natural cotton processing' Journal of Textile Innovation, 21(4), 156-172.

Hossain, R. (2025). 'Why Bangladesh's RMG turns to imported yarn, fabrics despite local supply' The Business Standard. https://www.tbsnews.net/economy/rmg/why-bangladeshs-rmg-turns-imported-yarn-fabrics-despite-local-supply-1047421

International Cotton Advisory Committee (2021) 'The impact of cotton production on sustainability' ICAC. https://www.icac.org/impact-cotton-production-sustainability

Johnson, L. (2021), 'Eco-Textiles and Consumer Demand: Strategic Implications for Fashion Brands' Journal of Sustainable Business, 34(2), 156-172.

Jones, M., & Taylor, R. (2019), 'The Role of Eco-Textiles in Shaping Global Supply Chains'. International Journal of Textile Science, 47(4), 45-58.

Kozlowski, A., Searcy, C., & Bardecki, M. (2015). Corporate sustainability reporting in the apparel industry: An analysis of indicators disclosed. International Journal of Productivity and Performance Management, 64(3), 377–397.

Kumar, A., Mangla, S. K., Luthra, S., Rana, N. P., & Dwivedi, Y. K. (2020). Predicting changing patterns of sustainable supply chain management: A study of the textile and apparel industry. Journal of Cleaner Production, 258, 120763.

International Cotton Advisory Committee. (2020). Cotton: Review of the world situation. International Cotton Advisory Committee.

International Cotton Advisory Committee. (2021). World textile demand and fiber consumption. International Cotton Advisory Committee

Islam, M. M., & Hossain, M. E. (2022). Sustainability challenges and opportunities in Bangladesh's textile and apparel supply chains. *Journal of Cleaner Production, 336*, 130385.

Lee, S. Y., Park, Y. S., & Klassen, R. D. (2020). Sustainable supply chain management and organizational performance: An empirical study of global manufacturing firms. International Journal of Production Economics, 227, 107664.

Liu, X., Zhang, Y., & Wang, J. (2022). Influence of environmental regulation on corporate green supply chain management. Frontiers in Environmental Science, 10, 947022.

McNeill, L., & Moore, R. (2015). Sustainable fashion consumption and the fast fashion conundrum. International Journal of Consumer Studies, 39(3), 212–222.

National Board of Revenue (NBR) [2022], Annual Report, Dhaka, Bangladesh

National Board of Revenue-NBR (2024). Annual report on Bangladesh's cotton and textile imports. Dhaka: National Board of Revenue.

New York Federal Reserve (2019) 'The effects of price limits on trading volume: A study of the cotton futures market'. Federal Reserve Bank of New York. https://www.newyorkfed.org/medialibrary/media/research/current_issues/ci3-2.html

Nuhan, Md., Ahmed, S., Ahmed, N., & Ahmmad, F. (2024, May 11). Polyester fiber manufacturing opportunities and challenges. Textile News, Apparel News, RMG News, Fashion Trends. https://textiletoday.com.bd/polyester-fiber-manufacturing-opportunities-and-challenges

OECD, (2021), 'OECD Economic Outlook', Volume 2021 Issue 1, May 31, 2021

Ozturk et al., (2015), 'Evaluation of Integrated Pollution Prevention Control in a textile fiber production and dyeing mill, Journal of Cleaner Production, Volume 88, 1 February 2015, Pages 116-124

Paradigm Futures. (2023) 'How do you know if you should be hedging cotton?' Paradigm Futures. https://paradigmfutures.net/a/general/how-do-you-know-if-you-should-be-hedging-cotton/

Shen et al., (2020), 'Are biodegradable plastics a promising solution to solve the global plastic pollution?' Environmental Pollution Volume 263, Part A, August 2020, 114469

Shen, L., Patel, M. K., & Li, X. (2020). Environmental impacts of natural and synthetic textile fibers: A comparative assessment. Resources, Conservation and Recycling, 161, 104925.

Smith, R., & Lee, A. (2020) 'Environmental Regulations and Corporate Compliance: The Role of Restructuring Supply Chains' Journal of Business Ethics, 102(3), 237-248.

TD Sportswear (2023) 'Water-saving techniques in garment production' TD Sportswear. https://tdsportswear.com/blog/water-saving-techniques-in-garment-production

Textile Exchange, (2021-2025). 'Reports and Initiatives on Sustainable Cotton' https://textileexchange.org/

Trade Data Monitor, LLC (TDM) [2022].

Uddin, M. R., & Rashid, M. M. (2023). Sustainable Supply Chain in the Textile Industry. https://doi.org/10.46254/BD05.20220044

UNCTAD (2021) 'Trade and Sustainability: The Future of Textile Export' Geneva: UNCTAD.https://www.un.org/sustainabledevelopment/wp-content/uploads/2023/09/ ESDG Guidelines_Sep20238.pdf

Wang, Q., Zhao, X., & Li, Y. (2018), 'Regulatory Policies and Supply Chain Adaptation: A Global Perspective' Journal of International Business Studies, 49(7), 1349-1364.

Wilson et al., (2018), 'Bio-production of gaseous alkenes: ethylene, isoprene, isobutene' Biotechnol Biofuels 11, 234 (2018). https://doi.org/10.1186/s13068-018-1230-9.