Sustainability Trends in Textile and Clothing Industry of Bangladesh Before and Post Pandemic Era

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Abstract:
The textile and clothing industry of Bangladesh, a vital player in the global supply chain, has undergone a transformative phase accentuated by the challenges posed by the COVID-19 pandemic. As the industry adapts to the "new normal," sustainability has emerged as a central theme, reshaping the trajectory of business operations and strategies. This abstract explores key sustainability trends influencing the textile and clothing sector in Bangladesh amid the post-pandemic era. The analysis encompasses environmental, social, and economic dimensions, shedding light on the industry's commitment to responsible practices. The post-pandemic era has accentuated the significance of social responsibility and ethical labor practices within the textile and clothing industry. The disruptions caused by the pandemic have prompted a reevaluation of sustainable textile trends. It emphasizes the need for regulatory frameworks that incentivize sustainable practices, enforce environmental standards, and ensure fair labor conditions. The abstract highlights the collaboration between the government, industry stakeholders, international organizations to foster a conducive environment for sustainable growth. In this abstract a comprehensive overview of the sustainability trends shaping the textile and clothing industry in Bangladesh post-pandemic. It underscores the industry's commitment to responsible practices, outlines key areas of development, and proposes a roadmap for a more sustainable and resilient future.

Keywords: Textile and Clothing Industry, Bangladesh, Sustainability trends, Post-pandemic Era.

Introduction
Bangladesh's quota limits and low wages made it more convenient for companies to operate (Atrey, 2023). The textile and garment industries in Bangladesh are the largest manufacturing activity, employing over 5 million people and accounting for 45% of all industrial employment in the country (Kiron, 2014). Bangladesh has second-largest garment industry dominated by ready-to-wear garments, and generated $31.46 billion in exports in 2020–21, more than 80% of the country’s overall exports. In the textile industry, Vietnam and Bangladesh are direct rivals (Hitch, 2023). Initial garment industry of Bangladesh was established in Dhaka in 1960 as local. Following deregulation, it was entirely focused on exports, with South Korean businessmen Daewoo and Desh Garments Ltd. founding the first ready-made clothing company with an export focus and years later it gradually expanded. The textile sector in Bangladesh has...
been the focus of discussions over trade vs aid. International bodies such as the WTO and the US have provided support to entrepreneurs in this field (Wikipedia, 2023). Industry-wide, sustainability is a major goal that emphasizes social, economic, and environmental aspects. Green production is becoming more and more important, and as a result, merchants and manufacturers of apparel and fashion are implementing eco-friendly and morally sound procedures (Costa et al., 2020).

Sustainable textile production refers to an environmentally friendly method of manufacturing materials and procedures that ensure all inputs and outputs are safe and healthy for people and the environment throughout their entire life cycle (Mallick, 2021). Here comes the COVID-19, despite being referred to as the "China virus" or the "Wuhan virus," the World Health Organization (WHO) formally identified COVID-19 as the new disease, affecting the entire world and almost stopping the economy (Sen et al., 2020). The pandemic had a significant impact on labor, materials, and demand, upending the global garment value chain. Developing nations bear a disproportionate share of the burden, with women workers being disproportionately impacted by rising rates of unpaid caregiving and gender-based violence (Castañeda-Navarrete, Hauge, & López-Gómez, 2020). The ongoing COVID-19 pandemic is causing production delays and order cancellations in Bangladesh's readymade Garments industry, which is leading to job losses, wage reductions, health issues for staff, and a host of other issues (Kabir, Maple, & Usher, 2021). The COVID-19 pandemic hastened the growth of e-commerce in the sector under study. Nevertheless, Previous exports USD 38.76 billion of Bangladesh's ready-made garment (RMG) exports has been increased by 12.55% to USD 31.46 billion in FY 2020–21 (Intelligence, 2022). Environmental, social, and economic problems are all included in the "triple bottom line" (TBL) concept. Key sustainability issues, such as financial accountability, legal duty, moral obligation, and charitable responsibility, are outlined in the Carroll Pyramid (Islam, & Abdul Halim, 2022). COVID-19 has significantly disrupted global supply chains, causing a significant drop in trade transactions and affecting the Bangladesh Garment Manufacturers and Exporters Association. The pandemic has also led to a predicted 22.5% drop in global footwear consumption, posing both economic and social sustainability challenges (Sarker, Moktadir, & Santibanez Gonzalez, 2021). Resource efficiency is essential for the textile industry's sustainable product development in the wake of the COVID-19 pandemic. Robotics, automation, the Internet of Things, and artificial intelligence (AI) can automate manufacturing lines, boost worker productivity, reduce inventory costs, and enhance forecasting accuracy. However, the implementation of these cutting-edge technologies requires significant infrastructure, knowledge, and financial resources (Alam et al., 2023).

Review Methodology: Systematic Review

Utilizing bibliometric techniques, we assisted with the content analysis stage (Van der Have, & Rubalcaba, 2016). Notably, bibliometric approaches are effective instruments for conducting quantitative analyses of scientific literature in a particular field of study (Ji et al., 2018; Zhi, & Ji, 2012). Science mapping is a fundamental bibliometric technique that was employed to ascertain the research field organization of a certain subject (Dzikowski, 2018; Cancino et al., 2017; Kashav et al., 2020). Many computer programs may be used to implement this analysis (Merigo et al., 2017). Using VOS viewer software, we created and visualized co-occurrence networks of keywords and paper terms in this article, highlighting the primary research areas and offering recommendations for more study (Liboni et al., 2019). Specifically, the co-occurrence analysis of keywords is a useful technique of determining research themes since it facilitates content analysis and evaluates the co-occurrence link between various concepts in the document (Kashav et al., 2020). Additionally, study clusters based on recurrent phrases that appear together
are displayed using the co-occurrence network of abstract concepts (Liboni et al., 2019). Because they are related to the same study sub-area, keywords and paper phrases are more strongly correlated when they appear together more frequently. Therefore, this paper's goal is to fill the gap by providing an extensive literature review (Van der Have, & Rubalcaba, 2016). This research offers a comprehensive evaluation of the literature (Greenhalgh, 1997). We thus divided the literature evaluation into two main stages in accordance with their contributions:

a) Data collection and Selection: In order to collect articles focused on this study issue under examination, this phase involves setting the inclusion/exclusion criteria, selecting the academic database (such as WILEY and ELSEVIER) to retrieve documents from, and specifying keywords and the search string (Cerchione, & Esposito, 2016).

b) Descriptive and content analysis phase: Descriptive statistics (such as papers over time and articles by technique) and a thorough content analysis of the chosen papers are conducted in this phase with the goal of finding research gaps and generating a research agenda for additional study (Centobelli, Cerchione, & Esposito, 2017).

Data Collection and selection

We adhered to the bibliometric protocols - expressed as a three-stage process in the reference - in order to acquire reliable findings for the literature review process (Harsanto, Michaelides, & Drummond, 2018). The initial step involves choosing the primary semantic word search on a search engine inside a certain database that typically yields selected articles (Harsanto, 2020). To get more specialized articles than the first filtering step, the second stage involves choosing articles based on more precise semantic terms (Denyer, & Tranfield, 2023). In the third step, the analysis and synthesis from the journals in the second stage is combined with the paper's findings through a summary, analysis, and synthesis that takes into account the historical and retrospective articles that have been published up to this point. This method can help us classify innovations that are focused on sustainability into three categories: organizational, process, and product innovations (Hansen, Grosse-Dunker, & Reichwald, 2009). Categorized each area into the first one, which represented the current level of research and showed how sustainable innovation was being undertaken, achieved, and anticipated in the textile sector going forward. The practice that exemplifies the different techniques used in the first category system is the second category (Hansen, & Große-Dunker, 2012). The next paragraphs provide descriptions of these phases.

Following a collaborative ideation session with five researchers, a list of keywords was determined in order to conduct a methodical search and locate papers pertaining to the topic of sustainability in the textile industries of Bangladesh. Additionally, the keywords from the previously located articles were occasionally added to the list of keywords to further improve it. Lastly, the subsequent search term was employed:

("textile industries*" OR "textile sector*" OR “clothing” OR “clothes” OR “garment” OR “fashion” OR “apparel”) AND (“green” OR "environmental performance" OR "financial performance" OR "Pandemic" OR "COVID-19” OR "economic* performance" OR "environmental benefit*" OR "financial benefit*" OR "economic* benefit*" OR "social benefit*" OR "ethical" OR "SDG*" OR "sustainable development" OR "corporate social responsibility" OR "Textile in Bangladesh" OR "environment-friendly" OR "eco-friendly" OR "circular economy" OR “reuse” OR "re-use" OR “After pandemic in Textile” OR "life cycle assessment" OR "life cycle analysis" OR “LCA” OR (“sustainability*”) AND (“environment*” OR "economic*” OR “social”).

In order to produce standard-quality papers, the first stage is our paper's content concentrates on gray literature. To make sure the journal maintains the standards of scientific standing, we categorized the search results using the peer-review procedure. We selected search phrases that have to do with innovation and sustainability. The term sustainability innovation is more specific. In contrast to other document
kinds, journal articles were the only ones subjected to a rigorous peer-review procedure because of the inclusion/exclusion criteria. There was just English spoken (Table 1).

<table>
<thead>
<tr>
<th>Inclusion Criteria</th>
<th>Exclusion Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article addressing textile industry innovation in sustainability</td>
<td>There is no mention of sustainable innovation in the textile sector in this article.</td>
</tr>
<tr>
<td>Type of document: journal papers subject to peer review</td>
<td>Book chapters, trade journals, conference proceedings, etc.</td>
</tr>
<tr>
<td>Language: English</td>
<td>Non-English language</td>
</tr>
</tbody>
</table>

**Figure 1. Literature Review Methodology**

- **Data Collection**
  - Focus group between five researchers
  - Definition of the search string characterised by a set of thirty-five keywords related to the logical intersection of the paradigm of sustainability and the textile and apparel industries in Bangladesh
  - Analysis of papers’ keywords frequencies to refine the search string
  - Filters adopted:
    - Only peer-reviewed articles were included in the review process
    - Only articles published from 2000 to 2019 were selected
    - Only English language articles were considered

- **Selection of papers**
  - First criterion (exclusion): abstract screening
    - Papers excluded on the basis of abstract analysis (N=133)
  - Second criterion (exclusion): full text screening
    - Papers excluded on the basis of full text analysis (N=107)
  - Third criterion (inclusion): “snowball” approach
    - Additional papers included in the analysis (N=64)

- **Final sample of 41 papers**

- **Descriptive Analysis**
  - Distribution of papers over time
  - Distribution of papers across journals
  - Distribution of papers by methodology

- **Findings and results**
  - Keywords analysis
  - Cluster analysis of sustainability indicators

- **Future Research Investigations**
In the second stage (Figure 1), the systematic review was conducted in second step using Google Scholar, which is renowned for its thorough coverage and the caliber of the journals it has chosen. After that, the search and filtering steps were carried out. In Google Scholar, a cursory search produced more than 800 items. A total of 335 journals were included after the inclusion and exclusion criteria were applied. A total of 307 articles were found when the databases’ metadata search results were combined and duplicates were eliminated. 64 items were obtained after the data were filtered according to title and abstract. After evaluating full-text publications to confirm eligibility, 41 papers that were extremely pertinent to the subject under investigation were found. So, As final results in total 335 papers were collected.

In the last stage, using information extracted from the complete reviewed literature into particular components and explaining their relationship based on organizational, process, and product innovations, we aggregated analysis and synthesis in the final step. Simultaneously, the synthesis was executed by arranging diverse analytical outcomes to generate insights that cannot be acquired via examining each piece of literature separately (Harsanto et al., 2022). The focus on analysis and synthesis relates to two research concerns that are examined in this work: the sustainability of innovative techniques in the textile sector and the condition of research at this time. The publication year, the journal, the setting, and the methods all contribute to the present status of the research. A data structure is used as the visualization to offer a clear image of the coding process (Gioia, Corley, & Hamilton, 2013) (Figure 2).

Figure 2. Bibliometric Flow Diagram for Sustainability Innovation in the Textile Industry
### Table 2. Electronic Database

<table>
<thead>
<tr>
<th>Database Name</th>
<th>Link</th>
</tr>
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<tbody>
<tr>
<td>ELSEVIER</td>
<td><a href="http://journalfinder.elsevier.com/">http://journalfinder.elsevier.com/</a></td>
</tr>
</tbody>
</table>

**Descriptive Analysis:**

Giving a broad overview of the publications on the post-COVID-19 Pandemic and sustainability in the TAF industries is the aim of the descriptive study.

Three frames of view were distinguished for the assessment of the 102 papers that were chosen:

1) how articles are distributed over time; 2) how papers are distributed among journals; and 3) how papers are distributed based on Methodology.

**a) Distribution of papers over time**

The distribution of the chosen papers published between 2020 and 2024 is depicted in Figure 3. The number of authored papers has increased rapidly, peaking at 44 in 2021. In 2024, the data gathering was carried out. This study indicates a considerable increase in research on sustainability in post-pandemic TAF industries during the previous four years. In fact, almost 43 percent of the articles that were reviewed were authored in 2021.

![Figure 3. Papers Over Time](image)

**b) Distribution of papers over journals:**

Fig. 4 lists the journals that from 2020 to 2024 published a maximum of the studies on sustainability in the TAF industries following COVID-19. As seen by the top journals publishing on the study topic, which include a wider range of topics and have a bigger reach, the investigation of sustainability challenges in the TAF sectors following the COVID-19 pandemic has expanded over time. Journal of Fashion Marketing and Management (14), in particular, is one of the journals shown in Figure 4. Journal of Cleaner Production (9), Journal of Business Research (12), International Journal of Consumer Studies (7), and Corporate Social Responsibility and Environmental Management (10), Journal of Business Ethics (15), Business Strategy and the Environment (3), and Asia Pacific Journal of Marketing and Logistics (8), and others (24) are the journals that follow.
Here we can see that, maximum number of published papers are taken from journal of business ethics which is about 14.71%.

c) Distribution of papers based on Methodology:
About 44% of the studies are based on quantitative techniques (such as surveys and mathematical models), whereas 27% of the articles employ qualitative approaches (such as single and multiple case studies), according to the distribution of publications by methodology shown in Fig. 5. Some studies employ blended methodologies, conceptual approaches, and literature review approaches (combining qualitative and quantitative methods).

![Figure 4. Papers over Journals](image)

![Figure 5. Papers by Methodology](image)
Results and Findings

According to Our Key words Findings Sustainability Trends is divided into three section, Such as: Sustainable Materials, Sustainable Economy (Technology, Innovation and Circular Economy) and Supply Chain Management.

Sustainable Materials

Following the COVID-19 outbreak, in Bangladesh consumer behavior shifted toward sustainable clothes usage (Khan, & Rammal, 2022). After COVID-19, a major subject in the literature on TAF industries of Bangladesh is the consumer's perception of environmentally friendly apparel (Sharpe et al., 2021). Post COVID-19 Pandemic, the attention in Bangladesh that was once reserved for an exclusive group of people is now focused on a broader group of developed customers who are more concerned with the supply chain's traceability and the product's place of origin (Hosen, Hossain, & Yasmin, 2023). Since the client is so important in the sustainable context, in Bangladesh it is critical to comprehend how he feels about recycled, eco-friendly, or used goods in the wake of the COVID epidemic (Rahaman et al., 2021). Following COVID-19 surveys make up the majority of the contributions in this cluster. In these surveys, structural equation modeling (SEM) was mostly used to evaluate the link between the components (Sakamoto, Begum, & Ahmed, 2020). Demonstrating a positive correlation between purchasing sustainable apparel and a number of antecedents, including social media usage, environmental attitude, green confidence, environmental awareness, label satisfaction, subjective norms, and perceived behavioral control following the epidemic in Bangladesh (Jubair Hossain, 2021). Young consumers of Bangladesh were questioned to investigate the impact of social influence and green consumption ideals on the purchase of organic apparel (Filho et al., 2023). In the COVID-19 Pandemic in Bangladesh, showing that a variety of characteristics, including behavior, subjective norms, perceived environmental sustainability, economic motive, and distance from the consumption system, favorably impacted consumers' inclinations to utilize online fashion rental services (Rahaman, & Islam, 2021). In addition, according to COVID-19 in Bangladesh, the two main variables that have the greatest detrimental impact on used clothes purchases are societal guilt and customers' ignorance of the outlets that are accessible (Khorana et al., 2022). Furthermore, a large number of research in Bangladesh looked at recycled and reused goods from different angles (Brydges, Retamal, & Hanlon, 2020). Researchers in Bangladesh looking into the COVID Pandemic found that consumers' intentions to donate clothing were influenced by prosocial and environmental beliefs as well as how they disposed of their used clothing, including selling, trading, returning, and giving (Rahaman et al., 2021). Other research examined that after Corona Pandemic, the recycling and reuse of garments in Bangladesh by surveying random samples of consumers (Hibberd, & Ali, 2021). Moreover, the disparity between the reason for buying and the actual experience of buying recycled and upcycled clothing after COVID-19 (Swazan, & Das, 2022). Additional research concentrated on the consumption intentions of upcycled, recycled, and repurposed apparel. Specifically, COVID pandemic in Bangladesh, how consumers feel about new garments made from recycled bottles. For hygiene reasons, consumers see this behavior adversely, which lowers their propensity to make a purchase (Taqi et al., 2020). Ultimately, in Bangladesh, a survey of 425 consumers and a multiple case study based on 20 in-depth interviews were done to examine the variables influencing clothes reuse, emphasizing many antecedents including altruism and money (Casey, 2021).

Circular Economy, Technology and Innovation

In Bangladesh it concerns about CE and CSR in COVID-19 for the TAF sectors. Since the implementation of CSR and CE is still in its early stages and requires a more complete
understanding based on qualitative analysis, this one differs from the previous one in that it includes a large number of exploratory research (Su et al., 2022). After COVID pandemic in Bangladesh the CE guidelines, in particular, greatly enhance sustainability in the production, use, and disposal of textile goods (Hossain, Sharif, & Asgar, 2022). Various models have been created to assist fashion firms in Bangladesh in switching from a linear to a circular economy paradigm after COVID-19 pandemic. In reality, a number of important aspects, including reverse logistics and sustainable product design, must be investigated in order to build a circular product in the context of the textile industry (Reza, & Plessis, 2022). In Bangladesh many concepts are discussed in the literature, including repairability, recyclability, lifespan, and product reuse and disposal. Plans for a circular textile economy, as well as many technical advances and methods for reusing, recycling, and regenerating textile waste, have been created, however they are still in their early phases as before the situation of COVID-19 (Tang, 2022). The life cycle assessment (LCA) approach is utilized to examine the environmental benefits resulting from various chances for recycling textile waste. According to the research, after COVID-19, recycling cleaning wipes has the biggest positive effects, followed by recycling cotton fiber, insulation, and polyester raw materials (Emran, & Schmitz, 2022). After COVID-19 Pandemic in Bangladesh, a numerous case study using semi-structured interviews to identify the factors influencing and impeding the adoption of a textile-to-textile recycling technology in the fashion sector of Scandinavia. The main obstacles include limited technology, which makes material separation challenging, expensive R&D expenses, and the complexity of the supply chain, which involves several parties in the manufacturing process. The primary motivators are the increasing apparel line and cooperation, as well as the creation and use of novel textiles (Huda, 2020). Additionally, after Corona in Bangladesh, a lot of research looked at the difficulties and solutions fashion firms have when created and implementing CE strategies into their existing business models using a case study methodology in Bangladesh (Fatema, Islam, & Rahman, 2023). After Corona, in Bangladesh, Fashion industries have difficulties in putting circular business models into practice because of client interest, differing value perspectives, poor alignment with existing objectives, and a lack of internal expertise. Reusable clothing value chains are mostly driven by corporate considerations, product qualities, and customer mindset, according to a study done on Swedish firms (Brief, 2021).

The slow fashion trend in Bangladesh was the subject of another research. According to the slow fashion movement after COVID-19, the fashion industry shouldn't carry on using its limited resources in the same manner that it has in the past. Consequently, the author provided a thorough description of how, in underdeveloped nations like Bangladesh, upcycling, craft, and teamwork are used to create new learning techniques and design (Bhattacharya et al., 2022). Research has looked at circular business models such as PSSs, collaborative fashion consumption (CFC), and clothes exchanging after COVID-19 struck Bangladesh. While CFC concentrates on garment sharing, second-hand buying, and renting, clothing exchanging increases the usable life of products. Compared to conventional ownership-based consumption, CFC has advantages for the environment. Comparing the environmental effects of a PSS business model on t-shirts using the Life Cycle Assessment (LCA) method (Ahsan, 2020). The COVID epidemic in Bangladesh has affected the drivers and obstacles of corporate social responsibility (CSR) initiatives. The main drivers of CSR strategies include market promotion, managers’ knowledge, societal influences, internal culture, and competitive setting. Lack of information, data, finance, training materials, the price of CSR initiatives, the absence of regulations, and the intricacy of designing green processes are some of the obstacles (Dobos, 2022).

**Supply Chain Management**

A sustainable supply chain in Bangladesh after COVID-19 is one that is established when all parties involved have the same goals, according
to some research (Paul et al., 2021). This means reevaluating the processes, materials, and flows of production in order to reduce pollution into the environment, minimize waste during production, prolong the life cycle of the goods, and enhance social circumstances. Moktadir et al., (2023) used the fuzzy Analytical Hierarchy Process technique based on Delphi to determine long-term elements for integrating social responsibility-based sourcing in Bangladesh's ready-made clothing supply chain (Bandranet al., 2019). Carried out case studies on sustainability issues and closed-loop supply chains in Bangladeshi textile enterprises following Corona. While Islam et al. (2023) study employed the life cycle assessment (LCA) approach to measure environmental effect and established a relationship between environmental concerns and corporate environmental disclosure, Marwah, & Ramanayake (2024) study emphasized the significance of strategic resources and shared vision among the firm and its suppliers.

The textile sector of Bangladesh's has suffered immensely for COVID-19 epidemic, which has disrupted supply chains and reduced demand for garments. In spite of these difficulties, it has created fresh chances for creativity and adaptability. In the post-pandemic era, this essay...
examines the potential, difficulties, and solutions facing the sector (Network, 2023). A notable obstacle confronting the sector has been a deceleration in output as a result of confinement measures and limitations on mobility. The Bangladesh Garment Manufacturers and Exporters Association (BGMEA) said that the nation lost almost $3 billion in textile export revenue in the first half of 2020, with a roughly 16% decline (Jubair Hossain, 2021). The Bangladesh Garment Manufacturers and Exporters Association reported $2.12 billion in earnings in June 2020, a record low for industry revenues despite a growth of 72.4% from the previous month and a 11.43% reduction from the previous year. The following Graph-6 exhibits export performance and growth rate of Financial Year 2019-2020 (Hossain, & Alam, 2022).

Beginning in June 2020, manufacturers in Bangladesh were running at just 55% of their potential; 90% of factories were experiencing order cancellations, and only 26% of consumers had confirmed that they would accept the items and pay for them. The BGMEA usually renegotiates conditions in such a scenario, but worldwide consumption of goods—particularly clothing—declined by 65%. Thus, it appears that RMG employees have a bleak future (Mirdha, 2020). Gender is a crucial factor contributing to workers' suffering. Workers in export manufacturing make about 60–80% of the workforce. Even prior to the epidemic, their rights, well-being, and even compensation were inadequate compared to their male colleagues. COVID-19 has simply made the situation worse (Jalan, 2020). Bangladesh faces challenges in meeting the COVID-19 pandemic's demands due to its large population and lack of assistance compared to wealthy nations. The lockdown and economic downturn will cause significant income losses for the working poor, forcing them to leave homes, violate isolation orders, and risk infection. One employee had to sell vegetables to support his family (Kabir, Maple, & Usher, 2021). The government of Bangladesh launched a $580 million stimulus program to help the sector pay worker wages because clients were canceling contracts and there were delays in the delivery of raw materials. That was obviously insufficient, though, as furloughed or fired workers protested in the streets demanding the reopening of industries and their pay (Ara News, 2024). One of the greatest instances of a manufacturing nation with a little profit margin is Bangladesh. It has previously been anticipated that layoffs and employment suspensions may result from the COVID-19 outbreak. Manufacturers may attempt to make up for the losses by reducing the number of employees or the number of working hours, which would lower revenue (Pavarin, 2020). Implementing water recycling and conservation practices to reduce water consumption and minimize the discharge of pollutants into water bodies (Costa et al., 2020). Adopting green chemistry and reducing the use of harmful chemicals in the production process. Embracing eco-friendly dyeing and finishing methods (Filho et al., 2023). Investing in energy-efficient technologies, such as renewable energy sources and energy-efficient machinery, to reduce the industry's carbon footprint (Harsanto et al., 2022). Implementing recycling programs for textile waste and exploring opportunities for upcycling to extend the lifecycle of products. Incorporating principles of circular design, such as using recyclable materials and designing products for easy disassembly and recycling (Islam, & Abdul Halim, 2022). Ensuring fair wages, reasonable working hours, and safe working conditions for all employees. Complying with international labor standards. Utilizing digital technology to enhance inventory control, industrial operations, and supply chain management in order to reduce waste and increase efficiency. putting into practice data analytics and Internet of Things (IoT)-based smart manufacturing techniques to maximize resource efficiency and minimize environmental effect (Alam et al., 2023). Collaborating to exchange best practices, information, and resources with NGOs, international organizations, and other stakeholders. Putting money into this area in order to identify novel and long-lasting solutions for the textile sector (Filho et al., 2023).
Conclusion

In the post-pandemic age, Bangladesh’s textile and apparel sector has been evolving toward resilient methods, ethical concerns, and responsible practices. To lessen its environmental impact, the sector has embraced energy-efficient technology, eco-friendly materials, and redesigned production procedures (Jubair Hossain, 2021). The popularity of social responsibility and ethical labor practices has increased, along with fair compensation, secure working environments, and extensive employee welfare programs (Atrey, 2023). Partnerships and certifications encourage responsibility and openness, building confidence among suppliers, employees, and customers. Resilience and diversification of the supply chain are now strategic imperatives, with a renewed focus on agility, digitization, and flexible production methods (Filho et al., 2023). The regulatory environment plays a crucial role in determining how sustainable practices in Bangladesh’s sector develop, since it establishes fair labor standards and provides incentives for sustainable practices.

The sector’s dedication to sustainability is a reflection of a common goal for a thriving, moral, and ecologically responsible sector that satisfies current demands without jeopardizing the capacity of future generations to satisfy their own (Atrey, 2023).

Limitations of Research

Sustainability trends are rapidly evolving, and the post-pandemic era might bring about new challenges and opportunities. Any research conducted before or during the early stages of the pandemic may not capture the latest developments (Filho et al., 2023). Availability of accurate and up-to-date data on sustainability practices in the textile industry of Bangladesh might be a challenge. Some companies may not disclose their sustainability practices, making it difficult to conduct comprehensive studies (Sakamoto, Begum, & Ahmed, 2020). The global sustainability discourse may not perfectly align with the local context of Bangladesh. Local factors, such as regulatory frameworks, cultural considerations, and economic conditions, need to be thoroughly understood for a holistic analysis (Jubair Hossain, 2021). The pandemic has introduced unprecedented challenges to the global economy. Assessing the long-term impact of these events on sustainability initiatives and practices may require more time and comprehensive, post-pandemic data (Harsanto, Michaelides, & Drummond, 2018).

Potential Directions for Future Studies

Investigate how the textile and clothing industry in Bangladesh has adapted to the challenges posed by the pandemic, and assess the long-term impact on sustainability initiatives (Ahsan, 2020). Examine how disruptions in global supply chains during the pandemic have influenced the sustainability practices of textile manufacturers in Bangladesh. Explore strategies for building more resilient and sustainable supply chains (Fatema, Islam, & Rahman, 2023). Study how changes in consumer behavior during and after the pandemic have influenced the demand for sustainable products. Analyze the role of sustainability in shaping consumer choices in the textile and clothing sector (Hosen, Hossain, & Yasmin, 2023). Investigate the role of digital technologies in enhancing sustainability efforts in the post-pandemic era. Explore how technologies like artificial intelligence, blockchain, and data analytics can be leveraged for sustainable practices (Huda, 2020). Assess the effectiveness of existing and new regulatory frameworks in promoting sustainability in the textile industry. Identify gaps and propose policy recommendations for further improvement (Atrey, 2023). Explore the level of collaboration between industry players, government bodies, NGOs, and other stakeholders in advancing sustainability goals. Identify opportunities for enhanced cooperation (Wikipedia, 2023). Investigate the impact of the pandemic on labor practices within the textile industry in Bangladesh. Assess changes in working conditions, employee well-being, and the overall social sustainability landscape (Bhattacharya et al., 2022). Identify and evaluate innovative sustainability practices and technologies adopted
by leading companies in the post-pandemic era. Highlight best practices that can be scaled across the industry (Emran, & Schmitz, 2022).

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