switch to Circular Economy Value Chains

Co-funded by the European Union

Ministry for Foreign Affairs of Finland

Policy Packages for Bangladesh's Circular Garment and Textile Transition

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

CHATHAM HOUSE

POLICY EXCHANGE BANGLADESH
Catalyzing Growth Solutions

Acknowledgments

Original title of publication: Policy Packages for Bangladesh's Circular Garment & Textile Transition

Authors:
- Hasnat Alam, Economist & Senior Manager, Policy Exchange
- Dr. Masrur Reaz, Chairman & CEO, Policy Exchange
- Dr. Patrick Schröder, Senior Research Fellow, Chatham House

Publication date: February 2025

Graphic design: Ramisa Rahman

Editing: Rahmina Ahmed

This policy report was produced under the Switch to Circular Economy Value Chains, a project co-funded by the European Union and the Government of Finland, implemented by UNIDO, in collaboration with Chatham House, Circle Economy, and the European Investment Bank.

For more information: www.switchtocircular.eu

The authors of this report would like to extend heartfelt appreciation to all contributors and reviewers who played a pivotal role in shaping this study. Their extensive knowledge and support have been instrumental in completing this report.

The authors express gratitude to the following individuals and organizations for their technical contributions and reviews:

UNIDO
- Mark Draeck, Chief Technical Advisor, Industrial Resource Efficiency Division
- Dr. Zaki Uz Zaman, Bangladesh Country Representative
- Asadun Noor, National Project Coordinator, Switch to Circular Economy Value Chains (Bangladesh)
- Ana Dimovska, Communications Specialist, Switch to Circular Economy Value Chains

Circle Economy
Hilde van Duijn, Managing Director, Circle Economy Foundation

EU Delegation
- Hubert Blom, Green Growth & Climate Change, European Union Delegation to Bangladesh
- Edwin Koekkoek, Team Leader, Green Inclusive Development, European Union Delegation to Bangladesh

Reverse Resources
- Nin Castle, Co-Founder & Chief Program Officer
- Mumit Hasan, Director, Business & Operations, Bangladesh
- Raffaella Carluccio, Programme Lead & Co-ordinator

Chatham House

- Johanna Tilkanen, Programme Manager, Switch to Circular Economy Value Chains

Policy Exchange

- Rahmina Ahmed, Program Associate

Other Contributors and reviewers:

- Professor Mohammad Bakhtiar Rana, Aalborg University & CREATE project lead

Photo Credits

- All images featured in this publication are courtesy of Canva and are provided under a copyright-free license for unrestricted use.

Sincere thanks also go to those who shared their valuable insights through key informant interviews and focus group discussions. This report is a testament to the collective efforts and expertise of individuals and organizations dedicated to promoting sustainable practices in Bangladesh's textile industry. Their contributions have enriched the content but also exemplified a collaborative spirit and a shared commitment to advancing circular economy policies in the garment and textile industry in Bangladesh.

Table of Contents

List of acronyms

8FYP	Eighth Five-Year Plan
BB	Bangladesh Bank
BBX	Bangladesh Climate Index
BIDA	Bangladesh Investment Development Authority
BTMA	Bangladesh Textile Mills Association
BOD	Biochemical Oxygen Demand
CETP	Common Effluent Treatment Plants
CP	Cleaner Production
CSDDD	Corporate Sustainability and Due Diligence Directive
CSR	Corporate Social Responsibility
DFQF	Duty-Free and Quota-Free
DoE	Department of Environment
EBA	Everything but Arms
ECA	Environmental Conservation Act of 1995
ECA	Ecologically Critical Areas
ECC	Environmental Clearance Certificate
EDF	Export Development Fund
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPZ	Export Processing Zones
ERM	Environmental Risk Management
ESG	Environmental, Social, and Governance
ESRM	Environmental and Social Risk Management
ETI	Ethical Training Initiatives
ETP	Effluent Treatment Plants
EU	European Union
FDI	Foreign Direct Investment
FI	Financial Institutions
GCF	Green Climate Fund
GSP	Generalized System of Preferences
GTF	Green Transformation Fund
IEPMP	Integrated Energy and Power Master Plan
ILO	International Labour Organization
IMF	International Monetary Fund
LDC	Least Developed Country
LEED	Leadership in Energy and Environmental Design
LIC	Low Income Country

LNG	Liquefied Natural Gas
MoEF	Ministry of Environment and Forest
NBR	National Board of Revenue
NBSAP	National Biodiversity Strategy and Action Plan
NGO	Non-governmental Organizations
ODA	Official Development Assistance
OSH	Occupational Safety and Health (OSH) Measures
PaCT	Partnership of Cleaner Textile
PET	Polyethylene Terephthalate
PLA	Polyactic Acid
R&D	Research and Development
RJSC	Registrar of Joint Stock Companies and Firms
RMG	Ready Made Garments
RR	Reverse Resources
SCB	Standard Chartered Bank
SDG	Sustainable Development Goals
SREDA	Sustainable and Renewable Energy Development Authority
UMIC	Upper Middle-Income Country
VAT	Value Added Tax
WTO	World Trade Organization

Executive Summary

The apparel sector has played a leading role in Bangladesh's remarkable growth and transformation. It is one of the largest in the world, employing over 4 million people and contributing significantly to the country's GDP and exports. However, the industry's resource-intensive and polluting nature has raised concerns about its environmental sustainability.

This report provides a comprehensive analysis of the current state of circular economy policies & practices in Bangladesh's textile and ready-made garment (RMG) sector. The report identifies critical barriers hindering the transition from a linear to a circular economy model, such as waste management informality, technological gaps, and investment challenges, all of which require policy actions.

Bangladesh faces significant environmental and social challenges, prompting the need for innovative strategies to enhance sustainability and economic competitiveness. The circular economy model, which emphasizes the continual circulation of materials within a closed-loop system, offers a promising solution by maximizing resource efficiency and minimizing waste generation. This approach represents a significant shift from the traditional linear model of resource consumption and could potentially transform the economic landscape of Bangladesh.

Bangladesh's textile and garment sector has made notable progress in sustainability and environmental protection but must now channel its efforts toward embracing circular economy practices. Circular policies and strategies that focus on resource efficiency, waste reduction, traceability and sustainable practices are necessary for the nation to navigate the challenges of graduation from Least-Developed Country (LDC) status and promote long-term economic resilience.

Internationally, governments are increasingly promoting sustainability initiatives and policies within the global apparel sector. The EU Circular Economy Action Plan (CEAP) focuses on sustainable products, consumer empowerment, and resource-intensive sectors, aiming to ensure that only sustainable products enter the EU market. The EU Strategy for Sustainable and Circular Textiles, passed in June 2023, emphasizes on circularity and products made with respect for the environment and social rights. Also, an increasing number of brands are now incorporating recycled textile products into their supply chains, signaling a significant shift towards sustainability.

In Bangladesh, brands are responding by sourcing recycled materials, such as "jhut" (textile scraps). This emerging relationship between recyclers and textile brands creates a mutually beneficial ecosystem that drives demand for recycled products. Other RMG-producing nations, such as Vietnam and Cambodia, are beginning to implement specific strategies focused on textile circularity. For Bangladesh, a key RMG exporter, adopting sustainable practices is essential for maintaining competitiveness.

Yet, several barriers exist that hinder the transition to a circular textile and garment industry. Bangladesh's garment waste recycling industry is primarily driven by informal operations, operating with limited regulation and oversight. The industry's technological capacity remains underdeveloped, with most recycling facilities dependent on outdated machinery and manual sorting techniques.

[1] EU strategy for sustainable textiles. European Commission. Retrieved October 18, 2023, from [https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12822-EU-strategy-for-sustainable-textiles_en]

Additionally, the political economy surrounding the export of waste materials underscores the complexities of the circular textile and ready-made garment (RMG) sector. Insufficient investment and the absence of a cohesive policy framework exacerbate these challenges. The resulting regulatory gaps force industries to contend with fragmented rules, significantly hindering large-scale progress toward establishing a truly circular textile sector.

Main barriers hindering transition to circularity in Bangladesh:

Informality of waste collection	• Network of collectors, sorters, and traders who engage in waste collection, sorting, and often export. • Involvement of local political figures and criminal groups adds a layer of complexity to the sector's dynamics.
Lack of Quality of collected Post-Industrial Waste	• Waste materials collected from factories are susceptible to contamination if proper procedures not followed. • Lack of data and tracability. Monitoring and documenting waste materials becomes indispensable to guarantee their proper recycling.
Limited Technological Capacity and Infrastructure	• Rudimentary technologies and outdated infrastructure impedes their ability to efficiently recycle a diverse range of materials.
Large investment needs	• Recycling materials (cotton and beyond) demands expensive, specialized machinery.
Lack of Comprehensive Policy Framework	• The absence of an overarching, comprehensive policy framework governing waste management in Bangladesh's textile sector, leading to informality & insufficient investment.

Bangladesh's textile and RMG sector struggles with fragmented efforts in adopting circular economy practices due to the absence of a unified policy framework. The lack of central coordination leads to inefficient resource allocation, creating barriers to progress in circularity. Currently, multiple regulations overlap, with no designated authority to manage circular economy transitions. Public-private dialogues are essential to align stakeholders on a common policy direction. Additionally, a centralized approach under one authority would streamline policy-making, reduce redundancy, and focus resources on accelerating circularity adoption.

An effective policy framework would also provide clarity on how circular economy initiatives can be integrated with existing environmental, labour, and trade policies. As the sector transitions toward circularity, establishing clear guidelines for waste reduction, resource efficiency, and extended producer responsibility (EPR) is crucial. Introducing incentives for companies to shift toward circular business models, such as tax relief on recycling investments or subsidies for green technologies, would further stimulate participation. Alternative measures, like removing regulatory bottlenecks and offering green credits for circular innovation, could support more sustainable growth.

Bangladesh's textile and RMG sector is characterised by the predominance of informal waste management, with little oversight or regulation of activities. This informal nature results in inefficiencies in the recycling process and labour rights violations for workers involved in collecting and sorting textile waste. The sector lacks proper waste flow traceability, making it difficult to track waste from production to disposal, which is vital for promoting circularity. Formalizing this sector through regulatory mechanisms and introducing standards would improve efficiency, transparency, and compliance with labour laws.

There is ambiguity in defining when textile waste (locally known as jhut) transitions from being classified as waste to becoming a valuable product. This lack of clarity results in inconsistent taxation, where jhut is sometimes taxed as waste and at other times as a marketable commodity. Additionally, unclear ownership rights create friction between various stakeholders, from manufacturers to recyclers, who seek to capitalize on textile waste. Clearly defining ownership and taxation standards for jhut would create consistency and encourage its integration into circular business models.

High VAT on textile waste discourages recycling initiatives, as businesses prefer to dispose of waste rather than invest in costly recycling processes. The current bonded warehouse system, designed to simplify the export of textile products, complicates waste transactions. As a result, businesses often find it easier and more cost-effective to handle waste informally, avoiding taxes and regulations. This informal waste handling undermines circularity goals, as less waste is recycled through formal channels. Revising the tax and bonded warehouse systems could incentivize formal recycling and reduce reliance on informal practices.

Bangladesh lacks specific policies that promote sustainable alternatives to incinerating textile waste. Incineration not only has adverse environmental impacts but also limits the potential for recycling materials back into production processes. Policies that promote cleaner alternatives, such as biogas or energy recovery methods, could help reduce textile waste incineration and further circular economy goals by converting waste into valuable energy resources, while maintaining environmental safeguards.

Bangladesh's complicated import and export regulations for jhut materials impede the growth of the circular textile economy. Current processes involve excessive bureaucratic steps, which make trading in recycled or upcycled materials challenging for businesses. Additionally, the lack of clear circularity principles in these regulations creates confusion for businesses that engage in the global circular supply chain. Streamlining these import/export regulations and embedding circular economy principles within them would facilitate smoother waste trade, fostering better integration into the global circular economy network.

Bangladesh's transition to circularity also faces significant financing challenges. A preference for short-term loans over long-term financing in the country's financial system restricts access to necessary capital for recycling technologies and circular projects. The absence of a robust bond market and reliance on bank financing creates a mismatch between the needs of circular enterprises and available funding options. Furthermore, a lack of green finance expertise within banks impedes the evaluation of sustainable project proposals, reducing access to green funds from the Central Bank or other sources.

Collateral requirements and high-risk perceptions towards innovative circular projects present additional barriers for small and medium enterprises (SMEs) in the recycling sector. These businesses often struggle to provide sufficient assets for loan security. The limited availability of financial products specifically designed for circular economy ventures also constrains growth.

To address these financing issues, expanding and improving funds like the Export Development Fund (EDF) and Green Transformation Fund (GTF) is crucial. Enhancing their operational modalities, reviewing eligibility conditions, and providing training on circular lending could increase accessibility. Introducing fiscal incentives, such as lower import duties on green investments, and liberalizing capital transactions are also necessary to encourage greater investment in sustainable projects.

Bangladesh's complex regulatory landscape, marked by numerous approvals and inconsistent policy enforcement, hampers investment in circularity and overall business competitiveness. The fragmented regulatory framework requires navigating multiple agencies for permits, significantly increasing costs and time, and discouraging foreign direct investment (FDI). Regulatory uncertainty and frequent changes in policies reduce investor confidence, further deterring investment in the country. Bureaucratic inefficiencies, including restrictions on profit repatriation by foreign investors, also hinder FDI inflow, unlike streamlined practices seen in regional competitors such as India and Vietnam.

Lack of traceability in the recycling supply chain further complicates circularity efforts. Recyclers lack access to reliable data about the quality of waste materials sourced from informal networks, leading to inefficiencies and increased costs. Additionally, the absence of policies requiring greater traceability makes it difficult to establish quality control in recycling processes, reducing overall efficiency and sustainability.

12 policy actions recommended for Bangladesh's textile and garment industry:

Recommendation	Description	Responsible Stakeholders
1. Develop a National Circular Economy Strategy for Textiles and Garments	Create a centralized framework outlining a roadmap for circularity in textiles, integrating clear targets and incentives.	Ministry of Commerce (MoC); Ministry of Textiles and Jute, Ministry of Forest, Environment & Climate Change (MoEFCC)
2. Formalize the Informal Waste Sector	Integrate informal waste collectors into formal systems with contracts, fair wages, and training programs.	Ministry of Labor and Employment, Ministry of Industries

3. Clear Waste Ownership and Recycling Guidelines	Establish legal frameworks defining waste ownership and recycling standards.	Ministry of Law, MoEFCC, MoC
4. Comprehensive Environmental Fiscal Reform	Overhaul tax systems to incorporate environmental costs, incentivize recycling, and establish dynamic adjustment mechanisms for environmental taxes.	Ministry of Finance, National Board of Revenue (NBR), MoC
5. Strengthen Regulatory Enforcement for Circular Economy	Develop standardized EIAs, enhance ETP compliance, and implement Extended Producer Responsibility (EPR).	Department of Environment, Ministry of Industries, MoC
6. Improve Business Climate for Circular Investments	Simplify trade regulations for waste materials and establish a one-stop digital platform for approvals.	Bangladesh Investment Development Authority (BIDA), NBR, MoC.
7. Address Logistics and Infrastructure Gaps	Invest in recycling facilities, create green energy alternatives, and enhance reverse logistics infrastructure.	Ministry of Energy, Minerals & Power; PMO
8. Public-Private Partnership (PPP) Framework	Develop innovative financing models and effective public-private partnership risk-sharing mechanisms for investments in circularity.	Ministry of Planning, Ministry of Commerce, PPPA
9. Targeted Green Financial Instruments	Promote green bonds, performance-based lending, and other innovative green financing models.	Bangladesh Bank, Ministry of Finance

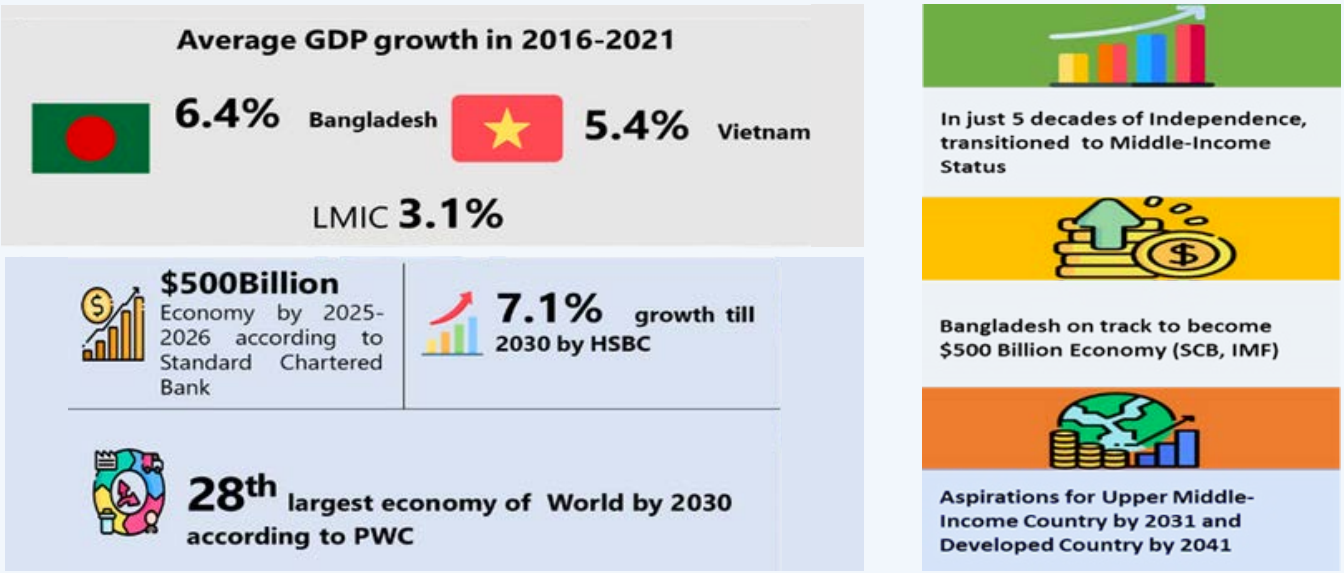
10. Encourage Foreign Direct Investment (FDI)	Improve investment climate, investment promotion activities and trade facilitation measures for greater FDI in circular economy initiatives.	Ministry of Finance, BIDA
11. Comprehensive Awareness and Capacity-Building Programs	Implement awareness campaigns for businesses and consumers, alongside technical assistance for SMEs.	Ministry of Information, Ministry of Commerce
12. Promote Consumer Awareness and Behavior Change	Launch education campaigns targeting consumers to encourage sustainable production and consumption.	Ministry of Information, MoEFCC

1. Introduction & Background

1.1. Bangladesh development Context

Over the past few decades, Bangladesh has achieved substantial economic growth, transforming from an agrarian economy to one that boasts a significant industrial and services sector. The nation's Gross Domestic Product (GDP) growth rate has been consistently commendable, averaging around 6% over the last two decades. Additionally, efforts to improve human development indicators have borne fruit. With extreme poverty rate plummeting to 5.6% in 2022 from 46.0 % in 1991, and remarkable achievements in human development, Bangladesh has taken significant steps toward reaching the first Sustainable Development Goal (SDG) target of eradicating extreme poverty by 2030.

Figure 1: Bangladesh's economic growth and development performance



Bangladesh's development so far has primarily been led by global trade and investment. Over the years, Bangladesh has become an important player in the global textile and ready-made garments value chain, which accounts for more than half of manufacturing employment. Exports from Bangladesh have recorded an annual average growth of about 10.25 % since 2001[1], while employment in the textile and ready-made garment sector grew 11 % between 2003 and 2010, outpacing all other nonagricultural sectors.[2]

The government's roadmaps, including the recently unveiled 'Export Policy 2024-2027,' which aims at raising export earnings to $110 billion by June 2027, have played a pivotal role in Bangladesh's socio-economic development. Bangladesh's robust export achievements, coupled with advancements in human development, have strategically positioned the country to attain a $500 billion economy by 2026, as projected by research from Standard Chartered Bank and the IMF. Additionally, Bangladesh is expected to ascend to the ranks of the world's 28th-largest economy as soon as 2030, as forecasted by PwC.[3]

[1] Export Performance of Bangladesh during the Pandemic: The Impact of Export Concentration (2022), Bangladesh Bank
[2] Moving Forward: Connectivity and Logistics to Sustain Bangladesh's Success, World Bank 2021
[3] Destination Bangladesh - PWC. Available at: https://www.pwc.com/bd/en/assets/pdfs/research-insights/2019/destination-bangladesh.pdf

The textile and ready-made garment (RMG) industry in Bangladesh has emerged as a cornerstone of the nation's economy, shaping its trajectory over the past few decades. The apparel sector has played a leading role in Bangladesh's remarkable growth and transformation. It is one of the largest in the world, employing over 4 million people and accounting for over 84% of the country's exports.[4] Employing millions and contributing significantly to the country's GDP and exports, this sector is pivotal to Bangladesh's economic landscape. However, the industry's resource-intensive and polluting nature has raised concerns about its environmental sustainability.

Textile production is a resource-intensive industry that poses significant environmental challenges and economic losses. The apparel sector, contributing to over 20% of global wastewater[5] and roughly 10% of global carbon emissions, has a significant impact on the environment and human health.[6] It is a highly resource-intensive sector, accountable for around 4% of the global fresh-water withdrawals, with annual per capita water consumption estimated at 23,900 liters, exacerbating water scarcity in many countries.[7] Furthermore, what is worse is that much of what is produced goes to waste. According to the Ellen MacArthur Foundation, the equivalent of one garbage truck full of clothing is sent to a landfill every second, either to be burned or buried. Less than 1% of materials used to produce clothing is recycled into new clothing, representing a loss of more than USD 100 billion worth of materials each year.[8]

Governments have started advancing sustainability initiatives and policies for the global apparel industry. As outlined in the Switch to Circular Economy Value Chains report, the EU is leading efforts[9] to reduce and reuse the high amount of waste generated across the textile and garment value chain. Countries like the US and Canada also prioritize environmental concerns, emphasizing traceability and circularity. Other RMG manufacturing countries like Vietnam and Cambodia have adopted dedicated strategies prioritizing sustainability and transitioning to circularity. For Bangladesh, a major RMG exporter, adherence to sustainable practices is imperative for competitiveness and retaining access to major markets. The global shift towards ethically produced garments offers Bangladesh an opportunity to distinguish itself on the global stage through timely adaptation of sustainability trends.

[4] Export Promotion Bureau; PE estimates based on EPB data
[5] https://www.europarl.europa.eu/topics/en/article/20201208STO93327/the-impact-of-textile-production-and-waste-on-the-environment-infographics
[6] https://www.worldbank.org/en/news/feature/2019/09/23/costo-moda-medio-ambiente
[7] https://quantis.com/wp-content/uploads/2018/03/measuringfashion_globalimpactstudy_full-report_quantis_cwf_2018a.pdf
[8] Scaling Circularity (2021). McKinsey & Company and Global Fashion Agenda
[9] International Circular Economy Policy Trends: Implications for Bangladesh. Switch to Circular Economy Value Chains. Available at: https://www.switchtocircular.eu/publication/international-circular-economy-policy-trends-implications-Bangladesh

1.2. Objectives

The primary objective of this report is to provide a comprehensive analysis of the current state of circular economy policies and practices in Bangladesh's textile and RMG sector. The report identifies critical barriers hindering the transition from a linear to a circular economy model, such as waste management informality, technological gaps, and investment challenges. By thoroughly reviewing existing policies and analyzing the gaps in the context of Bangladesh, this report proposes actionable policy recommendations that will support the sector's shift towards circularity. This transition is essential not only for mitigating the environmental impacts of the textile industry but also for enhancing Bangladesh's economic competitiveness in a rapidly changing global market.

Specifically, the report aims to:

- **Analyze the Current Landscape:** By examining the current state of circular economy policies and practices in the textile and RMG sector, the report provides a detailed assessment of existing policies, technological capabilities, and market structures. It also assesses the prevailing challenges, such as the informality of waste management, technological gaps in recycling processes, and the lack of investment in innovative and sustainable practices.

- **Identify Barriers to Circularity:** The report identifies key barriers hindering the transition to circularity, including the lack of formal waste collection systems, low quality of pre-consumer textile waste, technological limitations in recycling non-cotton materials, and the significant capital investment required for post-use recycling. It also investigates the broader political economy issues that affect policy implementation and sectoral reforms.

- **Highlight the Environmental and Economic Imperatives:** The textile and RMG sector in Bangladesh has a substantial environmental footprint, characterized by high levels of waste, water, and energy consumption. The report underscores the urgent need for transitioning to circularity to mitigate these impacts. Simultaneously, it highlights how adopting circular economy principles can strengthen the industry's global competitiveness by fostering innovation, improving resource efficiency, and meeting rising international sustainability standards.

- **Provide Policy Recommendations:** Leveraging global best practices, such as those seen in Cambodia, Thailand, and Vietnam, the report presents policy recommendations tailored to the Bangladeshi context. These recommendations focus on addressing gaps in waste management infrastructure, enhancing technological capabilities, fostering public-private partnerships, and introducing financial incentives to encourage sustainable investments. The proposed policies aim to create an enabling environment for circularity in the textile industry.

- **Support Socio-Economic Transformation:** The report also emphasizes the importance of ensuring a just transition to circularity by integrating social equity considerations. This includes promoting decent work standards, addressing potential trade-offs for vulnerable groups, and ensuring that marginalized communities are part of the planning and implementation process. Through skill development and capacity-building initiatives, the workforce will be empowered to contribute to the circular economy.

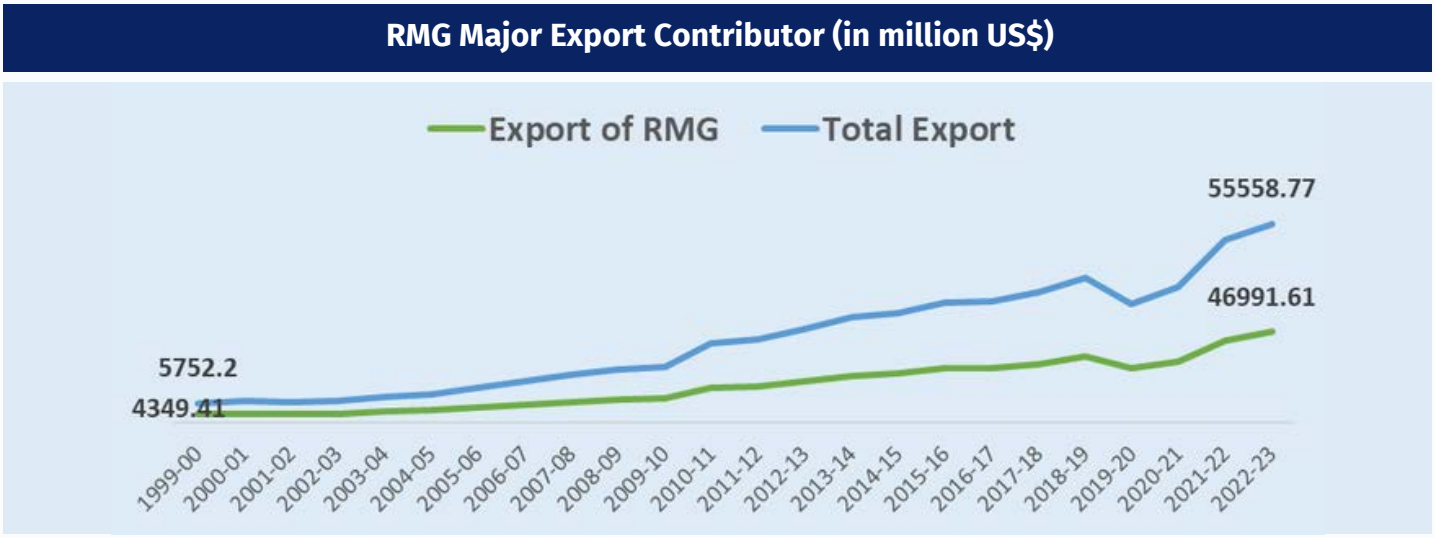
Ultimately, the objective is to position Bangladesh as a leader in circular economy initiatives within the global textile industry, enabling the country to achieve its sustainability goals while safeguarding the livelihoods of millions dependent on the sector. By adopting a circular approach, Bangladesh can not only reduce its environmental footprint but also drive economic growth and innovation, ensuring long-term resilience in an increasingly resource-constrained world.

2. Importance of Transitioning to Circularity for Bangladesh Apparel Sector

2.1. Brief Overview of the Bangladesh Textile & RMG sector

The Ready-Made Garments (RMG) sector has become the linchpin of Bangladesh's economic growth in recent decades. As the world's second-largest exporter of garments, Bangladesh has firmly established itself as a pivotal player in the global apparel supply chain.

Figure 2: RMG Export Growth Across the Years

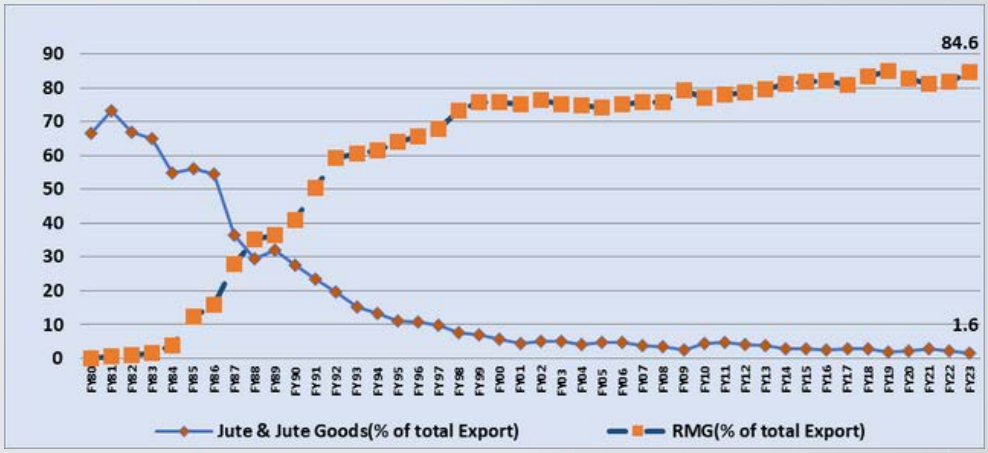


Over the past two decades, Bangladesh has seen a remarkable transformation in its export landscape, especially in the Ready-Made Garments (RMG) sector. In 2000, total exports amounted to $5.7 billion, with RMG contributing significantly at $4.35 billion. The following decade witnessed substantial growth, with 2010 seeing total exports reach $16.23 billion, and RMG exports surging to $12.49 billion. This trend continued into 2020, with total exports reaching $33.67 billion, of which RMG constituted a substantial $27.94 billion. In 2021, both categories continued to expand, reaching $38.75 billion in total exports and $31.457 billion in RMG exports. However, the most noteworthy surge occurred in 2022, with total exports surpassing $52 billion, of which an impressive $42.61 billion came from RMG. This data indicates a consistent upward trajectory, projecting total exports of $55.56 billion and RMG exports of $46.99 billion in 2023. These numbers underscore the RMG sector's pivotal role in Bangladesh's economic growth and its increasing significance on the global stage.[10]

[10] Export Promotion Bureau

Reforms undertaken in the early 2000s have laid foundation for RMG sector's growth. The introduction of measures such as a bonded warehouse system for duty-free imported inputs, back-to-back letters of credit for import finance, and a customs green channel for swift import-export cargo clearance bolstered the efficiency and competitiveness of RMG production. The establishment of free trade channels within export processing zones (EPZs) or the domestic economy further enhanced the sector's growth prospects. Nonetheless, amidst these gains, there has been a counterproductive trend with the rise of para-tariffs, notably supplementary and regulatory duties, which introduced anti-export bias and hindered non-RMG sectors, for example exports of jute goods (see Figure 3).

Figure 3: Export Share of RMG in Bangladesh



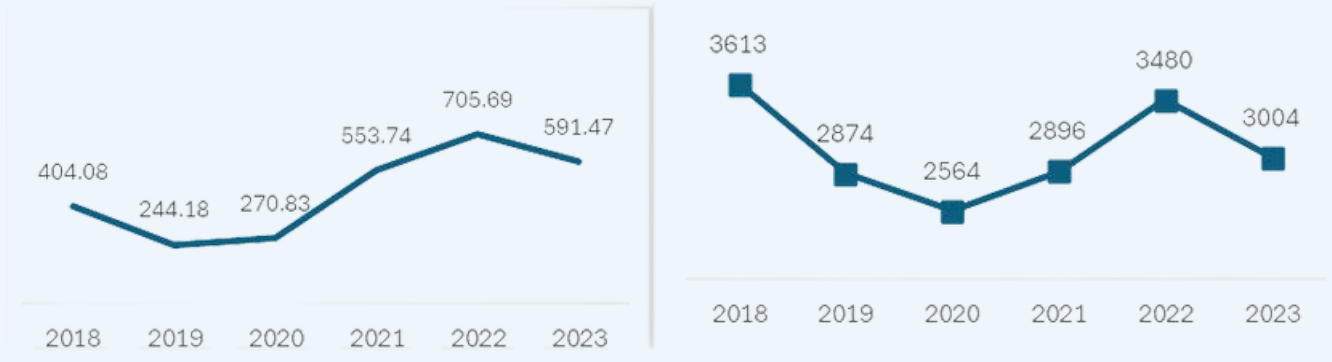
Source: Export Promotion Bureau

Foreign Direct Investments (FDI) have played a critical role in Bangladesh's textile sector, boosting the industry's global competitiveness. The genesis of Bangladesh's remarkable journey in the RMG sector through FDI can be traced back to its pioneering joint venture – the establishment of Desh Garments. This groundbreaking partnership, forged with the Korean Daewoo Corporation, marked Bangladesh's inaugural entry into the world of 100% export-oriented RMG. This partnership was initiated with a $1.3 million investment. Notably, this collaboration extended beyond investment; it encompassed infusion of marketing expertise, cutting-edge technology and comprehensive training of 130 workers and staff for an intensive six-month period. This transformative experience not only equipped the workforce with invaluable skills but also sowed the seeds for future garment factory ownership. Many of those who underwent this training have since established their garment factories, catalyzing the sector's indigenous growth. Simultaneously, Korean entrepreneurs ventured into the RMG sector within Bangladesh, further contributing to its dynamism. The profound impact of this joint venture resonates in the sector's current composition, where RMG exports constitute over 80% of Bangladesh's total exports.

In contemporary times, FDI continues to be a driving force in Bangladesh's RMG sector. Bangladesh is strategically positioning itself as a desirable destination for businesses looking to relocate their low-end readymade garments manufacturing units, primarily due to China's escalating manufacturing costs, rendering such production less feasible in the country. Bangladesh has sought China's cooperation in reshaping its RMG industry by transitioning from cotton-based manufacturing to producing high-value non-cotton items, thus ascending the value chain. In a parallel effort, Bangladesh is also actively vying for Japanese companies seeking to relocate from China, a trend that emerged following China's implementation of a zero-Covid lockdown policy. Furthermore, India has expressed its keen interest in investing within the non-cotton segment of Bangladesh's burgeoning textile industry. As Bangladesh actively seeks FDI to bolster its foreign exchange reserves, the RMG sector's well-established infrastructure and evolving global dynamics makes Bangladesh an attractive destination for businesses seeking relocation.

FDI inflow has fluctuated significantly in the period from CY 2018-2023, both in the Apparel sector and Bangladesh overall. FDI inflow into RMG sector was around USD 404.08 million in 2018. However, there was a significant drop in FDI inflows to USD 244.18 million in 2019, in line with overall FDI in Bangladesh across all sectors. This decrease can largely be attributed to the global uncertainty and disruptions that began with the onset of the COVID-19 pandemic, which negatively impacted investment confidence and operations worldwide. In 2020, the sector began to recover as the global economy adapted to the pandemic, although the overall FDI position worsened. The recovery accelerated in 2021, with inflows reaching USD 553.74 million, and peaking at USD 705.69 million in 2022, reflecting increased demand for textile products and a resurgence of investor confidence. In 2023, FDI slightly declined to USD 591.47 million.

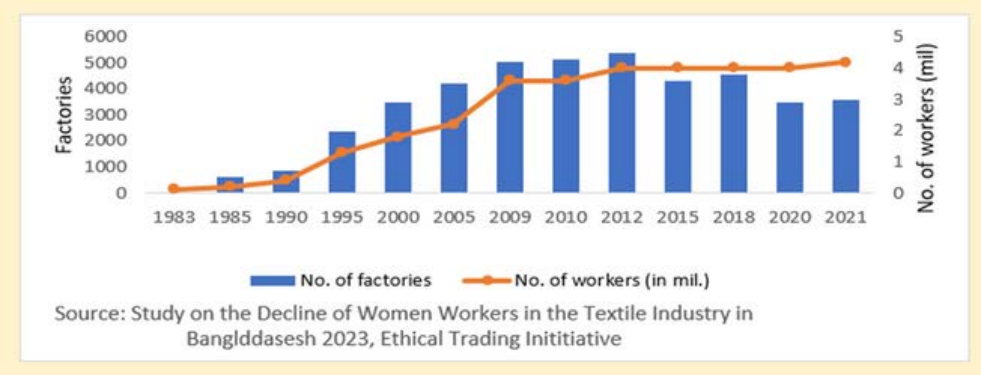
Figure 4: Net FDI Inflow in Textile Sector and Overall FDI in Bangladesh (In million USD)



Source: Bangladesh Bank

In 2020, the RMG sector employed approximately 4.22 million workers in Bangladesh. The RMG sector employs more than 4 million workers. However, the proportion of female workers in this industry has shown fluctuations over the years. A recent report by Ethical Trading Initiative (ETI) reveals that in 2021, the proportion of women in the RMG sector decreased to around 54 percent from 63.4 percent in 2010 and 60.5% in 2018.

Figure 5: Growth in the number of factories and employment in RMG



Source: Study on the Decline of Women Workers in the Textile Industry in Bangldasesh 2023, Ethical Trading Inititiative

2.1.1. Recent Trends and Challenges

Bangladesh's export-led growth, led by the garment sector, faces vulnerability and requires diversification for sustained development. At the heart of Bangladesh's developmental trajectory lies its export-led growth model, with the garment sector being the vanguard of this success story. However, the risks of over-reliance on this sector are vividly evident. A dire need for diversification emerges, as the country's vulnerability to external shocks is palpable. The excessive concentration on Ready-Made Garments (RMG) products, which constitute about 84% of the export basket, exposes the economy to turbulence.

A crucial turning point looms as Bangladesh prepares to graduate from Least Developed Country (LDC) status in November 2026, losing access to preferential trade benefits and policy space.

Bangladesh is likely to face significant reduction in annual export earnings following its graduation from LDC status. This transition will end access to special treatments and various preferential benefits the country currently enjoys under bthe Generalized System of Preferences (GSP), which allows Duty-Free and Quota-Free (DFQF) exports to various international partners of the World Trade Organization (WTO).[11] Bangladesh currently enjoys duty-free access to 38 countries, including the UK and 27 EU nations, under the GSP. However, upon graduation, Bangladesh will lose LDC-specific trade preferences, resulting in considerable changes to their tariff preferences and Rules of Origin requirements, which will be more stringent and difficult to comply with. Bangladesh might be in a position to qualify for the GSP+ scheme, an extension of the regular GSP, which will provide specific benefits provided the country makes significant improvements to its work and environmental standards and meets the eligibility criteria. However, even if the country secures GSP+, the textile sector looks set to miss out on duty-free benefits as its share of EU imports is well above the 7.4% threshold set to curb the dominance of 'large suppliers'.[12]

Graduating from LDC status also means Bangladesh less concessional loans and grants, leading to higher borrowing costs under less favorable terms. As a middle-income country, it will be difficult to maintain the current level of Official Development Assistance (ODA) in the form of foreign grants, development funds, or technical support, which is expected to decline rapidly over time from the current $700 million.[13] As a developing country, Bangladesh will see reduced access to these funds, which

[11] Textiles and Clothing in Asian graduating LDCs: Challenges and Options. UNCTAD, 2022
[12] Bangladesh needs a clear strategy for GSP+, The Daily Star (2021), https://www.thedailystar.net/opinion/rmg-notes/news/bangladesh-needs-clear-strategy-gsp-2093889
[13] Impact Assessment and Coping up Strategies of Graduation from LDC Status for Bangladesh General Economics Division (GED) Bangladesh Planning Commission Government of the People's Republic of Bangladesh. (Available at: https://gedkp.gov.bd/wp-content/uploads/2021/02/LDC-Study-Report.pdf.

will be redirected to more needy nations. This will make it difficult to secure monetary and technical assistance, including support from initiatives like the Green Climate Fund (GCF), which assists in adaptation to and mitigation of climate impacts.[14] This transformation necessitates urgent exploration of new economic avenues to ensure sustained growth. Bangladesh must harness its competitive advantages, invest in research and innovation, and strategically enter higher-value markets and industries.

Governments have started advancing sustainability initiatives and policies for the global apparel industry, which Bangladesh must adhere to remain competitive and retain market access.

The EU is leading efforts to reduce and reuse the high amount of waste generated across the textile and garment value chain. The EU Circular Economy Action Plan (CEAP) focuses on sustainable products, consumer empowerment, and resource-intensive sectors, aiming to ensure that only sustainable products enter the EU market. It promotes green public procurement, sustainable design, and waste reduction, particularly in the textile sector.[15] The **EU Strategy for Sustainable and Circular Textiles** passed in June 2023, emphasizes circularity and products made with respect for the environment and social rights.[16] A key development is the proposal for mandatory Extended Producer Responsibility (EPR) schemes for textiles in all EU member states [17] and a ban on destroying unsold textiles.[18] As many as 16 pieces of legislation are currently under discussion, including the EU's flagship Eco-design for Sustainable Products Regulation (ESPR),[19] set to come into full effect by 2025 and the following years.

Efforts to steer the fashion industry towards circularity have gained traction, bolstered in part by regulatory interventions designed to facilitate the transition to circular practices. The European Union's Circular Economy Action Plan encapsulates a commitment to imbuing textile manufacturing, products, consumption, and waste management with circular economy principles.[20] The plan underscores the importance of a circular approach, compelling nations to segregate all textile waste by 2025. Several European nations have also implemented extended producer responsibility schemes, holding brands and retailers accountable for post-consumer waste and requiring their financial contributions towards product collection, recycling, and reuse.

In alignment with this commitment, the EU has implemented a set of regulations and strategies to enhance sustainability within the textile industry. The Eco-design for Sustainable Products Regulation (ESPR) establishes stringent standards for product durability, repairability, and recyclability, aiming to extend product lifespans and reduce waste.[21] Complementing this, the EU also introduced Strategy for Sustainable and Circular Textiles, and the Environment and Social Due Diligence (ESDD) which sets forth ambitious objectives to lessen environmental impacts across the textile lifecycle, providing comprehensive guidelines for design, production, and end-of-life management.[22] These initiatives, backed by recent European Commission policy actions, represent critical advancements toward embedding circularity within textile manufacturing and consumption, with a strong focus on environmental preservation and fostering sustainable growth across EU member states.

[14] Impact Assessment and Coping up Strategies of Graduation from LDC Status for Bangladesh General Economics Division (GED) Bangladesh Planning Commission Government of the People's Republic of Bangladesh. (Available at: https://gedkp.gov.bd/wp-content/uploads/2021/02/LDC-Study-Report.pdf.
[15] EU strategy for sustainable textiles. European Commission. Retrieved October 18, 2023, from [https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12822-EU-strategy-for-sustainable-textiles_en]
[16]Eu strategy for sustainable and circular textiles, European Commission. Retrieved October 20, 2023, from [https://environment.ec.europa.eu/publications/textiles-strategy_en]
[17] European Commission (2023). Circular economy for textiles: taking responsibility to reduce, reuse and recycle textile waste and boosting markets for used textiles [Press Release]. https://ec.europa.eu/commission/presscorner/detail/en/ip_23_3635.
[18] EU countries back ban on destruction of unsold textiles. Reuters. Retrieved October 23, 2023 from https://www.reuters.com/world/europe/eu-countries-back-ban-destruction-unsold-textiles-2023-05-22/
[19] European Commission, "Ecodesign for Sustainable Products Regulation", https:// commission.europa.eu/energy climate-change-environment/ standards-tools-and-labels/products labelling-rules-and-requirements/ sustainable-products/ecodesign sustainable-products-regulation_en
[20] "EU strategy for sustainable textiles", European Commission, https://ec.europa.eu/info/law/ better-regulation/have-your-say/ initiatives/12822-EU-strategy-forsustainable-textiles_en
[21] "Ecodesign for Sustainable Products Regulation", European Commission, https://commission.europa.eu/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/ecodesign-sustainable-products-regulation_en
[22] EU Strategy for Sustainable and Circular Textiles, https://environment.ec.europa.eu/document/download/74126c90-5cbf-46d0-ab6b-60878644b395_en?filename=COM_2022_141_1_EN_ACT_part1_v8.pdf

Countries like the US and Canada also prioritize environmental concerns, emphasizing traceability and circularity. In the US, the New York Fashion Sustainability and Social Accountability Act plans to hold major brands accountable for ESG impacts and supply chain traceability.[23] Similarly, The Responsible Textile Recovery Act of 2024 introduces a structured stewardship program in California, mandating that apparel and textile producers participate in a Producer Responsibility Organization (PRO). This organization will oversee the collection, repair, sorting, recycling, and proper management of textile products. By enforcing sustainable waste management practices, this legislation seeks to significantly reduce textile waste, lower environmental pollution, and foster a more sustainable approach within the fashion and textile industries.[24] Canada is also adopting circular policies through the National Zero Waste Council and local initiatives like the Vancouver circular textile hub. In the UK, the Green Claims Code aims to stem greenwashing, while China has committed to peaking carbon emissions before 2030 and become carbon neutral by 2060.[25] Legislations for selling sustainable products in major markets, with circular design and material usage, would apply to the Bangladesh RMG and will complicate market access to major market if the issues are not addressed on time.[26]

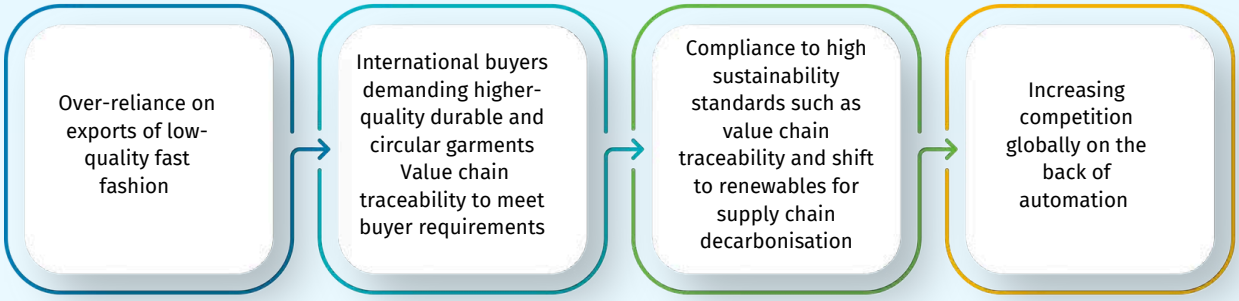
Besides regulatory requirements, changing dynamics and shifts in consumption pattern also calls for a fundamental change in Bangladesh's reliance on fast-fashion production. Shifting consumer preferences towards sustainability are driving fundamental changes in the fashion industry, challenging Bangladesh's reliance on traditional business models. Younger generations are increasingly concerned about environmental issues. In a GlobalData Consumer Survey, it was found 70% of all consumers agree that addressing climate change is more important now than ever, and shoppers feel guilty about buying fast fashion.[27] For Bangladesh, a major RMG exporter, adherence to sustainable practices is imperative for competitiveness. The global shift towards ethically produced garments offers Bangladesh an opportunity to distinguish itself on the global stage through timely adaptation of sustainability trends.

During the last decade, the sector has had a major overhaul and has worked towards a sustainable path. The tremendous bounce back since the Rana Plaza tragedy and continuous strides toward workers' safety, water, and energy sustainability have been highly appreciated globally. As of May 2024, Bangladesh has 218 Leadership in Energy and Environmental Design (LEED) green garment factories certified by the US Green Building Council— out of which 84 are platinum-rated, 120 gold-rated, and the rest silver-rated. Nine out of the world's top 10 green RMG factories are located in Bangladesh.[28] Additionally, 49 out of the top 100 LEED-certified green garment factories in the world are situated in Bangladesh.[29] More than 500 factories are in the pipeline to achieve the green factory status. For the remaining 3000 factories, it must be noted that in a highly cost-competitive environment, attaining LEED and other certifications such as ISO 14001 is quite challenging due to the level of financing required. These standards are much above the national requirements and the cost involved stands as a major barrier for most firms in the sector.

.

[23] The New York Fashion Act, https://www.thefashionact.org/
[24] Responsible Textile Recovery Act of 2024, https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202320240SB707
[25] UK Green Claims Code, https:// greenclaims.campaign.gov.uk/; "An Energy Sector Roadmap to Carbon Neutrality in China", IEA, September 2021, https://www.iea.org/reports/ an-energy-sector-roadmap-to-carbon neutrality-in-china
[26] International Circular Economy Policy Trends: Implications for Bangladesh. Switch to Circular Economy Value Chains. Available at: https://www.switchtocircular.eu/publication/international-circular-economy-policy-trends-implications-Bangladesh
[27] 2020 Fashion Resale Market and Trend Report | thredUP
[28] [1] Insights, T., Bangladesh adds 12 more LEED certified garment units in 2024 - Textile insights, Textile Insights - Delivering Inspiring Information. Available at: https://textileinsights.in/bangladesh-adds-12-more-leed-certified-garment-units-in-2024
[29] https://textilefocus.com/top-100-leed-green-factories-number-country-based/

Figure 6: Bangladesh is Facing Several Broad Challenges to Remain Competitive



2.2. Environmental and Social Impacts of the Linear Economy Model

The prevailing linear economy model in the global fashion industry has brought about profound environmental and social repercussions. This model, characterized by the take-make-dispose approach, exerts a staggering toll on our planet.

Figure 7: RMG and Textile Waste harming the Environment

Source: United Nations, World Bank, Ellen MacArthur Foundation, Textile Exchange, Bloomberg, BCG[30]

[30] Circular Strategies for a Garment's End-of-Life Moment. BCG. Available at: https://www.bcg.com/publications/2023/end-of-life-recycling-in-the-fashion-industry

The apparel sector ranks as a significant contributor to environmental degradation. It is responsible for a substantial portion of global greenhouse gas emissions, accounting for approximately 2-8% of these emissions . The sourcing phase, encompassing the preparation of raw materials, production, and processing, represents a major source of these emissions.[31] Moreover, the industry's reliance on non-renewable resources, such as fossil fuels, amounts to a staggering 98 million tonnes annually. This alarming figure is poised to surge in the coming years, given the escalating preference for man-made fibers, primarily polyester polymers, which now constitute a staggering 72% of global textile production. Traditional cotton textiles, accounting for the remaining 28%, have not dwindled in significance. Moreover, 92 million tonnes of textile waste is produced each year globally.

In Bangladesh, wet treatment and dyeing sections are highly water intensive. In a study in 2016, it was found that 217 million cubic meters of wastewater was generated in the production of 1.80 million metric tonnes of fabric. According to the IFC Partnership of Cleaner Textile (PaCT) wet processing consumes 300L of water to manufacture each KG of fabric every year annually. The huge consumption of water has already begun causing depletion of groundwater. A study on groundwater level data between 1980-2012, showed that in Dhaka and Gazipur, groundwater level saw a steep decline in 2003 (with the mushrooming growth of textile industries in these areas)[32].

The fashion industry is also a relentless generator of textile waste. In Bangladesh, the industry churns out approximately 830,000 tonnes each year, a considerable portion of which meets an ignominious end in landfills or incinerators[33]. A Bangladeshi RMG factory on average generates around 700-750 kg of waste fabric (Jhut) daily, with varying prices based on quality and size, ranging from $0.1 to $3 per kilogram[34]. Notably, these fabric scraps find use in making children's clothing, some of which is exported to India. Dhaka's bedding sector relies on recycled fabric and processed cotton for products like mattresses, pillows, cushions, and seat fillings in automobiles and rickshaws[35]. Alarmingly, over 87% of fibers utilized in production globally are destined for incineration or landfills, squandering a staggering USD 500 billion worth of potential value annually, which could have been unlocked through reuse or recycling.[36] This monumental waste production far surpasses the capabilities of our planet's natural systems.

Perhaps a graver concern is the unrelenting surge in textile consumption globally. Over the past two decades, global garment production has nearly doubled, escalating from 50 billion units. This alarming trend is reinforced by consumer behavior patterns, which now see the average consumer purchasing clothes at a rate 60% higher than in previous years. The increasing purchasing power, coupled with economic prosperity, has led to a culture of fast fashion, characterized by frequent and short-lived clothing purchases. To add to this, manufacturers design garments for shorter lifespans. If this consumption trajectory persists, global apparel consumption is poised to skyrocket to a staggering 102 billion units by 2030, equating to a 50% surge in greenhouse gas emissions, a harrowing projection outlined by the Ellen MacArthur Foundation.

[31] FASHION on CLIMATE, https://www.mckinsey.com/~/media/mckinsey/industries/retail/our%20insights/fashion%20on%20climate/fashion-on-climate-full-report.pdf
[32] Parvin, M. (2019) The Rate of Decline and Trend Line Analysis of Groundwater underneath Dhaka and Gazipur City. Journal of Water Resource and Protection.
[33] Reverse Resources 2024. Further elaborated in Section 2.4.
[34] The story of waste fabric (Jhoot): Positioning Bangladesh. Textile Today. Available at: https://www.textiletoday.com.bd/the-story-of-waste-fabric-jhoot-positioning-bangladesh
[35] The Apparel Story, BGMEA, https://www.bgmea.com.bd/uploads/newsletters/apparel-story-october-november-2021.pdf
[36] https://www.unep.org/news-and-stories/press-release/un-alliance-sustainable-fashion-addresses-damage-fast-fashion

2.3. Importance of transitioning to a Circular Economy for sustainability and economic competitiveness

In the face of environmental and social challenges, Bangladesh stands at a crossroads, compelled to explore innovative solutions to enhance its sustainability and economic competitiveness. The circular economy approach emerges as a promising solution, advocating for the circulation of materials within a closed-loop system to maximize resource efficiency and minimize waste generation. Embracing a circular economy holds the potential for transformative change. By shifting from the linear model of resource consumption to a circular approach, Bangladesh can promote resource efficiency and reduce waste. A shift towards circularity is not only environmentally responsible but also economically beneficial. For instance, recycling alone was reported to save Bangladesh around $100 million annually, with the informal sector recycling 4 to 15% of waste.[37]

Figure 8: Why Circular Economy is crucial for Bangladesh

[37] National 3R strategy for Waste Management Ministry of Environment and Forest Bangladesh. Available at: https://faolex.fao.org/docs/pdf/bgd190976.pdf

Responding to Global Policy Shifts:

Globally we are seeing a shift in policies pushing driving the fashion industry towards a reality check. Self-regulation of sustainability is drawing to a close by the end of 2024, as regulators are stepping in. With fashion responsible for significant emissions, pollution, and waste, regulators are set to require companies to both fix their operations and force higher standards in their supply chains. The regulations apply across key areas of activity, including product design, waste management, sourcing & production, sustainability reporting & traceability.[38] The EU is leading the charge as it pursues a vision for a climate-neutral, circular economy, with growth decoupled from the consumption of finite resources. The EU's textiles vision is encapsulated in its Strategy for Sustainable and Circular Textiles, passed in June 2023, which envisages an industry defined by products made with respect for the environment and social rights. Countries like Bangladesh, which are heavily reliant on EU exports, must comply with the EU's Waste Framework Directive, ESPR, ESDD, Corporate Sustainability Reporting Directive, and Corporate Sustainability Due Diligence Directive (CSDDD), which are already in effect. The CSDDD, introduced in March 2024, applies to major EU and non-EU companies operating within the EU, emphasizing ethical supply chains, and social and environmental responsibility.

Figure 9: EU countries among highest export destination for Bangladesh

Compliance with evolving regulations is critical for Bangladesh's export-dependent economy to sustain and grow trade relationships with the EU, the largest export destination for many nations. This entails rigorous due diligence processes to address potential human rights and environmental issues within supply chains. Bangladesh boasts a vast and skilled workforce, complemented by its strategic geographic location and robust government support, providing a solid foundation for continued growth. Burgeoning global demand for sustainable and ethically produced garments, offering Bangladesh an avenue to distinguish itself on the global stage, provided it makes timely transition in line with global trends, to sieve opportunities.

[38] BoF-McKinsey State of Fashion 2024

Broader Economic Benefits

Under the right enabling conditions, the circular economy could provide new opportunities for economic diversification, value creation, and skills development in Bangladesh – going beyond waste management and recycling. With enough investment, developing countries could leapfrog developed countries in digital and materials innovation aimed at sustainable production and consumption patterns[39]. There is a growing need for material, water, and renewable energy (e.g. solar, wind) because of both population growth and increased demand driven by infrastructure, industry, and consumers in developing countries. Circular economy activities have the potential to address a significant share of this need– dampening or, possibly, reversing the rise in resource use by developing countries, and in turn reducing resource depletion, climate change, and the pollution of natural areas.

Circularity isn't just about compliance; it's also an opportunity for robust economic growth. The transition to circular practices within the RMG sector holds the potential to catalyze significant economic advantages for Bangladesh. Beyond regulatory requirements, the adoption of circular principles can be a powerful driver of prosperity. One notable advantage is the formalization of jobs. The RMG sector in Bangladesh has traditionally involved a substantial informal labor force. Informal workers often endure poor working conditions and lack the benefits and protections afforded to formal employees. However, the circular economy's emphasis on resource efficiency, recycling, and sustainable practices requires a structured and organized approach. This shift necessitates a formalized workforce, which, in turn, can lead to improved labor conditions, access to social benefits, and job security for workers.

Moreover, circularity generates new employment opportunities. As Bangladesh establishes the infrastructure and practices required for recycling, waste management, and sustainable production, it creates openings for skilled and semi-skilled workers. These jobs span various sectors, from recycling facilities and waste management centers to research and development focused on sustainable materials and production processes. In this manner, the transition to circularity contributes not only to formalization but also to job creation, ultimately bolstering the country's economic landscape.

Figure 10: Economic Benefits of Circularity in Bangladesh

[39] Chatham House (2019) 'An Inclusive Circular Economy. Priorities for Developing Countries'

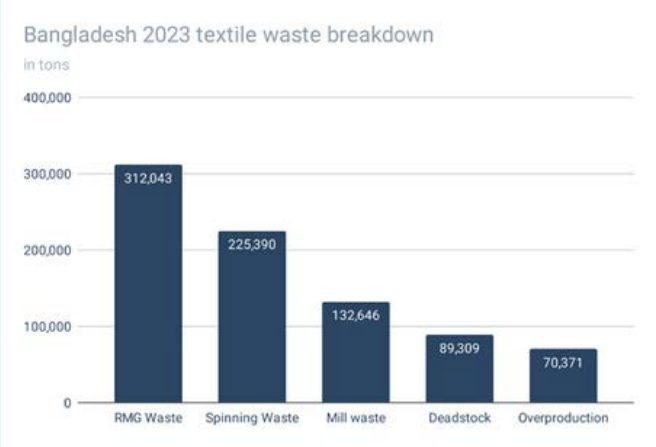
Recycling and reusing cotton waste locally can further boost the economy by conserving foreign exchange reserves. Traditionally, Bangladesh imports significant quantities of virgin cotton to meet the demands of its RMG industry. In FY 2022, Bangladesh imported raw cotton worth $4.4 billion[40], with the per kilogram price averaging $2.4. This value increased to $4.5 billion in FY 2023, with the per-kilogram price rising to $3.7.[41] According to a USDA report, Bangladesh imported 8.5 million and 6.3 million bales of raw cotton in 2022 and 2023 respectively. Raw cotton imports for 2024/25 are estimated to reach 8 million bales.[42] These imports consume valuable foreign exchange at a time when reserves are historically low. By adopting circular practices that prioritize the recycling and reuse of cotton waste, Bangladesh can substantially reduce its reliance on costly imports, retaining these reserves for broader economic development initiatives. This represents a fiscally prudent approach that not only strengthens the nation's economic stability but also aligns with sustainability goals by decreasing the environmental impact associated with cotton production and transportation.

2.4. Current state of Circularity in Bangladesh Textiles & RMG Sector

2.4.1. Waste Generation

Bangladesh's textile and RMG sector generates significant amounts of waste annually, presenting both a significant environmental challenge and an economic opportunity. This waste predominantly consists of cutting scraps, faulty fabrics, offcuts, fluff, and deadstock, and emerges from different stages of the production chain. The textile waste is managed through a combination of informal and formal channels.

Figure 11: Post-industrial textile waste breakdown, Bangladesh, 2023 (in metric tonnes)

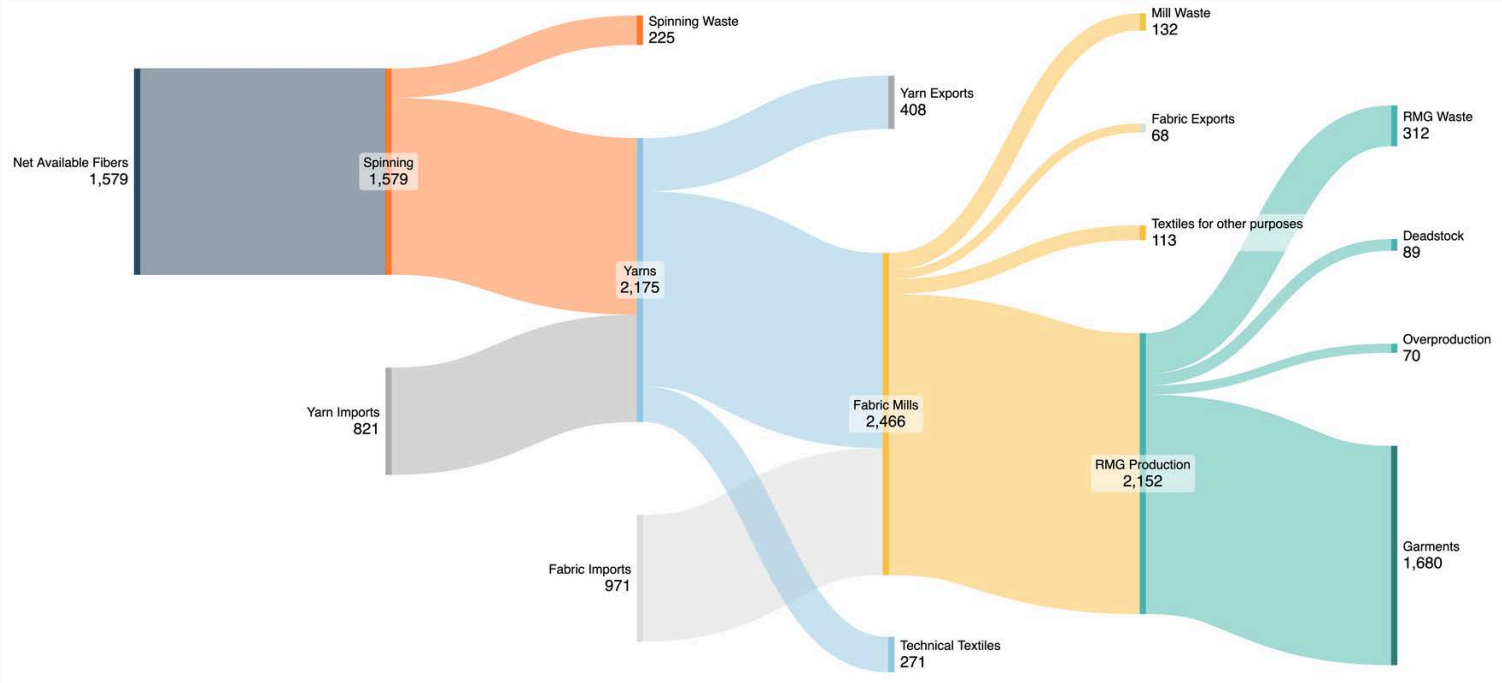


Source: Reverse Resources, 2024

[40] 397,441 million BDT in FY22 & 437,410 million BDT in FY23
[41] FOREIGN TRADE STATISTICS of BANGLADESH 2022-23 BANGLADESH BUREAU of STATISTICS (BBS) STATISTICS, https://bbs.portal.gov.bd/sites/default/files/files/bbs.portal.gov.bd/page/8643ec8b_27a3_41cd_bbd9_9be3479f578e/2024-05-12-07-34-e579cd4a68742f5c4e7184120cb9d08b.pdf
[42] Cotton and Products Annual Bangladesh, https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Cotton%20and%20Products%20Annual_Dhaka_Bangladesh_BG2024-0003.pdf

Reverse Resources (RR), a Software-as-a-Service platform collaborating with brands and recyclers globally to match textile waste with the best possible recycling solutions, estimates around 830,000 tons of textile waste was generated in Bangladesh in 2023. The majority of the waste, around 38%, came from RMG factories, while around 27% were generated in the spinning process. Another 16% emerged from fabric mills when processing the yarns, and the remaining 19% of waste was in the form of deadstock and overproduction from RMG factories.

Figure 12: Post-industrial textile waste flows, Bangladesh, 2023 (in 000 metric Tonnes)



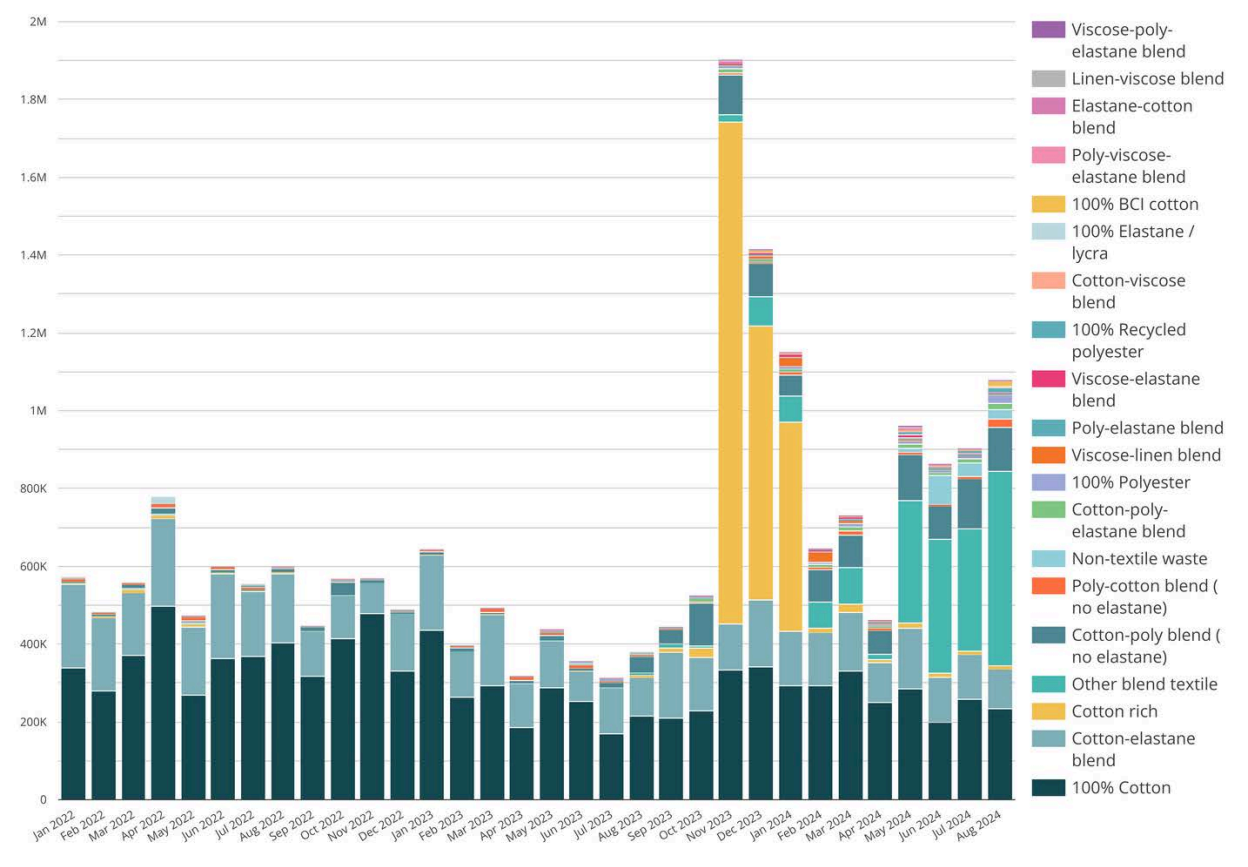
Source: Reverse Resources, 2024

The Sankey diagram above illustrates the flow of textile materials and waste across various stages of the textile and RMG production process in Bangladesh in 2023, as estimated by RR. It begins with 1,579 Kilotonnes of net available fibers entering the spinning phase to produce 1,354 Kilotonnes of yarns, generating 225 Kilotonnes of spinning waste in the process. A portion of the yarn, amounting to 408 Kilotonnes, is exported directly, and the remaining and futher imported yarns (821 Kilotonnes) is directed to fabric mills, resulting in a total input of 2,466 Kilotonnes for fabric production.

In the fabric mills stage, 132 Kilotonnes of mill waste are produced. After processing, 68 Kilotonnes of fabric are exported, and 113 Kilotonnes are diverted to other sectors. The remaining bulk of 2,152 Kilotonnes continues to the RMG production phase. The RMG production process, however, results in further 312 Kilotonnes of waste. Additionally, 89 Kilotonnes remain as deadstock, and 70 Kilotonnes are categorized as overproduction, representing further inefficiencies and material losses. The final output of the RMG production is 1,680 Kilotonnes of finished garments.

RR's estimation of the flow and volume of industrial textile waste in Bangladesh in 2023 highlights inefficiencies in current resource utilization and production, pointing to potential opportunities for improving sustainability within the textile and RMG sectors by better managing resources and reducing overproduction, while also enhancing circularity by utilizing the wastes efficiently.

Figure 13: Compositions of waste registered on the RR Platform by month, Bangladesh (in kg)



Source: Reverse Resources, 2024

The bar graph above illustrates the monthly distribution of textile waste, categorized by material composition, registered on the Reverse Resources platform from January 2022 to August 2024. A total volume of 21,170,642 kgs (21,170 tonnes) was reported from Bangladesh facilities over that period. The bars represent monthly waste generation, with significant fluctuations observed over the period. Notably, there is a sharp spike in November 2022, where the volume exceeds 1.8 million kgs, which is considerably higher compared to other months. This spike could indicate a seasonal surge in production, large-scale disposal, or improved data reporting during that period.

The material composition of the waste is diverse, with 100% cotton and cotton-elastane blend dominating the waste stream, followed by cotton-poly blend and other blend textiles, reflecting a variety of materials used in the production processes. Other compositions, including elastane blends, viscose, and non-textile waste, represent smaller portions of the total waste. Throughout the analyzed period, the trend shows consistent waste generation, with a few months exhibiting noticeable peaks and troughs. Since August 2023, on average, there appears to be a steady growth in waste registered on the platform, with more facilities being included in RR's platform.

2.4.2 Managing the Waste

The textile and RMG sector in Bangladesh is gradually adopting circular practices to manage the large volumes of waste it generates. The implementation of circularity with the waste generated varies significantly across the industry— reflecting a mix of informal practices, emerging sustainable partnerships, and vertically integrated systems.

1. Informal Recycling Practices: A considerable portion of textile waste, locally known as "jhut," is managed through informal practices that lack transparency and formal documentation. Factories often sell their waste at minimal prices to local businesses controlled by powerful local entities, including politically and economically empowered groups. These businesses take on the responsibility of cleaning, sorting, and aggregating the waste based on its composition and color. The sorted jhut is classified into categories such as 100% cotton white, cotton-rich white, and mixed compositions including polyester or viscose, among others.

This sorted waste is then sold to both domestic and international buyers. While some of it is repurposed locally into products like low-cost garments for the domestic market, a significant amount is exported to countries like Vietnam, India, China, and Finland for recycling. In these countries, the waste is processed into recycled fabric or yarn, which is often sold back to the Bangladeshi factories, creating a continuous loop. This informal system, however, operates without detailed records or formal oversight, posing challenges for sustainability and ethical practices within the industry.

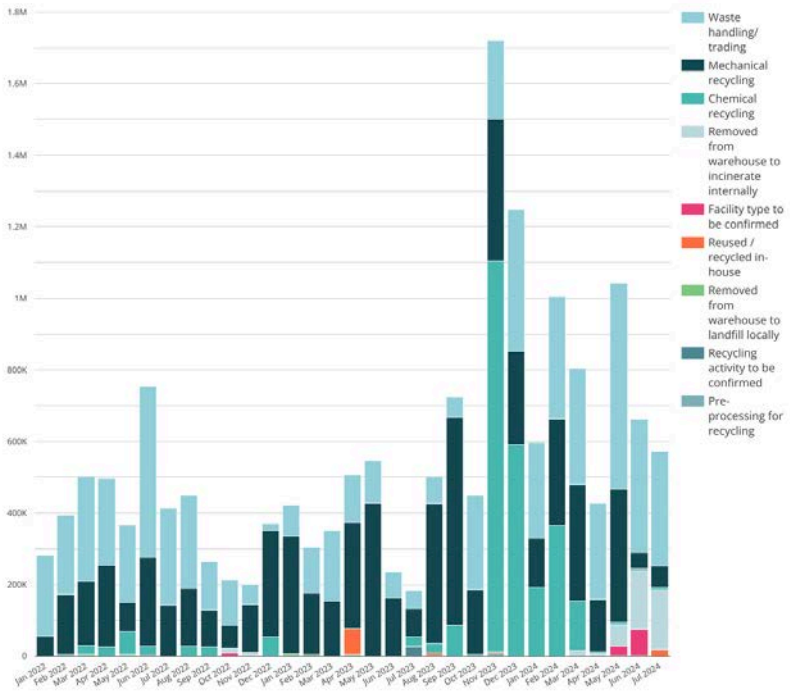
2. Sustainable Waste Management Partnerships: Some factories in Bangladesh have adopted a more sustainable approach by collaborating with organizations like Reverse Resources and CYCLO, as well as participating in global initiatives such as the Global Fashion Agenda (GFA) since 2019. In these cases, waste management begins within the factory premises, where waste is cleaned, segregated, and sorted according to its suitability for recycling. This pre-sorted jhut is then transferred to partner facilities, where it undergoes mechanical recycling processes to be transformed into fiber, yarn, or fabric.

The recycled materials are subsequently reintroduced into the production cycle, effectively closing the loop in a circular fashion model. These sustainable partnerships not only help factories meet their environmental targets but also contribute to the industry's broader goals of reducing waste and promoting responsible circularity. This approach reflects a growing trend towards formal, traceable recycling practices that enhance environmental stewardship and accountability.

3. In-house Recycling at Vertically Integrated Facilities: A select number of factories have taken their commitment to sustainability a step further by integrating recycling processes within their own operations. Approximately 10 to 15 vertically integrated facilities have adopted this model, where they recycle 20-30% of the cotton waste generated on-site[43]. These factories have established comprehensive recycling mechanisms, converting their waste into valuable raw materials like recycled yarn and fabric. The remaining waste is either sold to partner recycling facilities or to local vendors, ensuring that it remains within a responsible and traceable waste stream.

By combining internal recycling efforts with strategic partnerships, these vertically integrated factories are setting a benchmark for sustainable practices within the industry. However, certain types of waste, such as printed and mixed fabric, still pose challenges due to their complex composition and limited recyclability. Consequently, this waste often ends up in landfills, highlighting areas where further technological advancements and policy support are needed.

Figure 14: Waste shipments by destination registered on the RR Platform by month, Bangladesh (in kilograms)



Source: Reverse Resources, 2024

The figure above depicts the monthly waste transactions recorded on the Reverse Resources (RR) platform from January 2022 to July 2024, representing the movement of 16,330 tonnes of waste from facilities. The graph categorizes these transactions based on different waste destinations and processing methods. The predominant categories include "waste handling/trading," "mechanical recycling," and in recent times, other processes such as "chemical recycling," "internal incineration".

Throughout the observed period, the most significant volume of waste was directed towards "waste handling/trading" and "mechanical recycling," indicating an emphasis on material recovery. Notably, mechanical recycling saw fluctuations, with peaks in May 2023 and September 2023. The spike suggests periodic escalations in recycling activities, possibly due to increased production or targeted recycling initiatives, as well as increased reporting in that period.

[43] GIZ 2024. Study for a Regulatory Framework to Enable Recycling of Post-Industrial Waste (JHUT) for the RMG Industry in Bangladesh.

"Chemical recycling" also showed a significant increase in waste volumes, particularly from November 2023 onwards. This trend highlights an improvement in waste management infrastructure in Bangladesh for advanced recycling methods and larger investments being attracted in that sphere. Furthermore, a minor proportion of waste was "removed from warehouse to incinerate internally" reflecting inefficiencies or gaps in waste management practices of factories resorting to incineration for meet energy needs due to fluctuations in energy supply.

Bangladesh's textile & RMG waste, comprising mostly pre-consumer scraps and remnants, is currently underutilized despite its potential economic value. With approximately 830,000 tonnes of garment waste generated annually[44], only a small fraction, around 5%, is recycled into exportable products according to the Bangladesh Textile Mills Association (BTMA). Around 40 factories in Bangladesh are engaged in recycling textile waste into yarn and fabric, with major players like Simco Spinning & Textile Ltd, Square Textiles, and the Ha-Meem Group leading the way. The latter has recently expanded its recycling capacity, aiming to produce 16 tonnes of recycled cotton per day, and plans to double this capacity. Around 30-35% of the waste is repurposed to craft clothing for the domestic market and to make quilts, mattresses, and pillows for local consumptions.[45] The remainder is more commonly, exported or discarded in landfills, posing environmental risks and representing lost economic opportunities.

Properly recycling this waste could not only alleviate the environmental burden but also substantially reduce the reliance on imported raw materials, particularly cotton. According to BTMA, by converting textile waste into recycled materials, the country could decrease cotton imports by 15%. In FY 23 alone, Bangladesh imported over 1.2 million tonnes of raw cotton, costing around $4.5 billion. Effective recycling could have saved the country about $700 million in the same year, highlighting the substantial economic benefit of waste recycling.

The potential revenue from recycling is immense. If garment waste recycling is fully optimized, the industry could generate an additional $5 to $6 billion annually through upcycling, according to BGMEA, in comparison to the $400 million currently generated from waste exports. This potential is currently untapped due to various policy barriers and challenges such as VAT of 7.5% and 15% applicable when purchasing and selling textile waste respectively, and the lack of policy support and incentives for scaling up recycling operations. Industry leaders advocate for policy reforms and more importantly reducing disincentives to bolster recycling efforts and establish a robust circular economy.

[44] Reverse Resources, 2024
[45] https://www.tbsnews.net/economy/rmg/how-recycling-rmg-waste-can-cut-15-cotton-imports-and-earn-billions-766438

3. Identifying Barriers to Transitioning to Circularity for Bangladesh Textiles Industry

Recycling pre-consumer waste within the apparel sector is a promising yet emerging endeavor in Bangladesh. While the textile and RMG industry is a powerhouse in the country, characterized by its substantial contributions to exports and employment, the recycling of pre-consumer waste remains in its early stages. This section focuses on the challenges for the adoption of circular economy principles, particularly recycling in the textiles industry.

One of the foremost challenges confronting Bangladesh's textile and RMG industry pertains to the fledgling state of pre-consumer waste recycling. Recycling of pre-consumer waste in the apparel sector is still in its nascent stages in Bangladesh. A substantial proportion of firms operating within this sector lack a comprehensive understanding of the significance and benefits of recycling within the circular economy context. This knowledge gap poses a formidable barrier, hindering their willingness to invest in recycling practices and transition away from the prevailing linear production model that dominates the industry.

Figure 15: Different challenges and barriers to circular economy transition

Informality of waste collection	• Network of collectors, sorters, and traders who engage in waste collection, sorting, and often export. • Involvement of political figures adds a layer of complexity to the sector's dynamics.
Lack of Quality of collected Post-Industrial Waste	• Waste materials collected from factories are susceptible to contamination if proper procedures are not followed. • Lack of data and traceability. Monitoring and documenting waste materials become indispensable to guarantee their proper recycling.
Limited Technological Capacity and Infrastructure	• Rudimentary technologies, and outdated infrastructure impede their ability to recycle a diverse range of materials efficiently.
Large investment needs:	• Recycling materials (cotton and beyond) demands expensive, specialized machinery.
Lack of Comprehensive Policy Framework	• The absence of an overarching, comprehensive policy framework governing waste management in Bangladesh's textile sector, leading to informality & insufficient investment.

3.1. Informality of Garment Waste Collection

One of the defining characteristics of the garment waste recycling industry in Bangladesh is the dominance of the informal sector. While some piecemeal legislation addresses aspects of industrial textile waste reduction and disposal and a handful of factories practicing sustainable waste management in collaboration with partners or at their facilities, the majority of jhut/waste management activities in the sector occur informally. This includes a network of collectors, sorters, and traders who engage in waste collection and sorting. The involvement of political figures adds a layer of complexity to the sector's dynamics. Local political workers, often with connections to political elites, are known to be involved in the collection of pre-consumer waste from factories.

This informal approach to waste management can result in inefficiencies, a lack of oversight, and inadequate working conditions for those involved in the process. The manual sorting of waste materials in unsuitable conditions not only affects the health and safety of workers but also hampers the quality of waste that is seldom damaged in rough weather conditions. Secondly, this informal collection system can lead to conflicts and disputes, including violent incidents. While clashes between political groups over business control & sharing have decreased, violence remains a concern.

High informality and the overall investment climate hinder investments in processing waste. Recycling waste materials requires substantial investments in advanced technologies and machinery, making it capital-intensive. While the large investment requirement can be a barrier to entry, especially for small firms, the presence of informality and uncertainty over return on investment can discourage potential investors from entering the industry. Challenges in Bangladesh's overall investment climate, coupled with informality and uncertainty, result in lower investor confidence. The lack of incentives for circular practices, both at the policy and industry levels, further discourages businesses from investing in waste recycling. This perceived lack of commercial viability plays a significant role in hindering technology investments in the circular economy sector. Addressing these challenges will necessitate a comprehensive approach involving government policies, industry initiatives, and international collaboration to promote a more sustainable and circular textile and RMG sector in Bangladesh.

Bridging the gap between informality and formality in the textile and RMG sector is a multifaceted endeavor. One of the primary goals is to systemize the informal sector to ensure a seamless transition toward circular practices. This means introducing formal regulations, standards, and oversight mechanisms. By doing so, the sector can achieve improved quality control, predictability in operations, interconnected supply chains, and enhanced traceability. However, it's crucial to acknowledge that this systemization process must be balanced with considerations of potential price increases and its impact on businesses, particularly those in the informal sector. Coordination efforts are essential to ensure that while moving toward formality, the overall cost of doing business doesn't rise significantly for informal sector participants. Moreover, it's vital to design this transition in a way that allows informal participants to share in the profits generated by more sustainable practices, thereby incentivizing their involvement in the circular economy.

Obtaining data on how much waste is being produced, or tracking the waste as to where it goes, is extremely difficult. While waste management throughout South Asia is highly shrouded and guarded sector by different interest groups, in Bangladesh, the level of vested interest and corruption is much higher than the rest. This means that obtaining data on how much waste is being produced, or tracking the waste as to where it goes, is extremely difficult. Showing a business case of how much manufacturers can earn if they begin to sort waste and sell it to recyclers can help but there is still much that needs to be done to understand the different routes that "jhut" takes following elimination from factories.

3.2. Lack of Quality of Collected Pre-Use Waste & Inefficiencies in Pre-Treatment

Poor standards in waste handling poses significant challenges in the textile and RMG industry in Bangladesh. When waste materials are collected from factories and handled without following proper procedures, they are susceptible to contamination. Brands and manufacturers often seek consistent and high-quality materials to meet their product standards. When recycled materials are of subpar quality, brands are less likely to incorporate them into their products, affecting the market for recycled yarn and other recycled textile materials. Contamination in post-industrial waste, especially for mixed fiber types, reduces output quality, limiting the recyclability of textiles. These factors demand a highly homogenous input stream, which is difficult to achieve in Bangladesh due to a lack of proper sorting and pre-treatment infrastructure.

Mixed and contaminated inputs like blended fibers or garments with coatings and elastane, requires more complex pre-treatment at higher costs. Inputs that include laminated and coated products are particularly problematic, as the coatings and adhesives maintain the integrity of the textile structure, making it challenging to separate the textiles into individual fibers. As a result, mechanical recycling cannot yield spinnable fibers from these materials. Additionally, textile waste containing 10% or more elastane by weight is also undesirable. This elastomeric fiber complicates the shredding and unraveling processes, requiring greater force to break down the fabric and retrieve individual fibers[46].

Several recyclers in Bangladesh have highlighted a scarcity of high-quality mono-stream waste, as poor sorting and pre-treatment methods lead to prevalence of mixed inputs that are seldom contaminated. High-quality and homogeneous inputs are crucial for effective textile recycling as they directly impact the efficiency and quality of the output. Ensuring a steady supply of high-quality, homogeneous textile waste is vital to improve the economic viability and environmental impact of recycling efforts. When recyclers receive well-sorted and uncontaminated textiles, machinery can operate more effectively, reducing the risk of damage and ensuring that fibers are not compromised during processing. Homogeneous inputs, such as textiles made from a single fiber type and similar color, lead to a higher yield of spinnable fibers, minimizing the need for blending with virgin materials.

Understanding the fate of post-industrial waste is crucial for improving waste management practices and fostering circularity within the textile and RMG industry. Gaining insight into the pathways and material flows of post-industrial waste is key for enhancing circular practices within the textile and RMG sector. Presently, there is a lack of data about the flows and handling of post-industrial waste within this industry.

[46] Tex-Med Alliances ,2023. A Study on technologies for recycling and re-use of textile scraps.

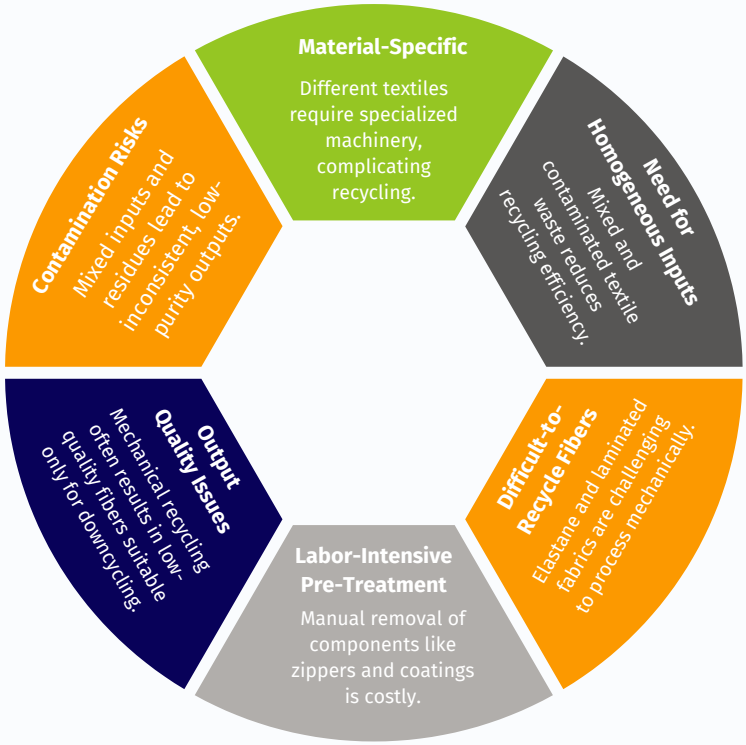
Establishing a transparent system for monitoring and documenting waste materials becomes indispensable to guarantee their proper recycling or environmentally responsible disposal. Such a system would grant individual recyclers the transparency they need concerning the source, quality, and potential contamination of waste materials. Currently, some recyclers resort to conducting laboratory tests on each batch of textile waste to assess its quality and check for potential contaminants. This practice introduces significant additional costs into the recycling process[47].

3.3. Limited Technological Capacity and Infrastructure:

The circular economy sector in Bangladesh faces constraints due to a lack of technological sophistication and capacity. The textile and RMG industry generate a wide array of materials, including various fabrics, blends, and accessories. Recycling such diverse materials necessitates advanced sorting and processing technologies capable of handling different textile types and compositions. However, recycling and processing facilities in Bangladesh, particularly in the informal sector, often operate with outdated or rudimentary technologies. Many recycling facilities also lack the essential equipment and expertise required to manage this complexity.

Mechanical recycling, which is the primary mode of recycling in Bangladesh due to its relatively low cost, requires different machinery settings to process the diverse textile materials such as natural, synthetic, and blended fibers effectively. The material type, in combination with the textile texture determines the required machinery and the potential output. Tightly woven fabrics, which are more resistant to tearing, present a challenge as they result in shorter, lower-quality fibers compared to loosely knitted textiles that are in general easily opened by tearing machines. This variety in material properties necessitates the use of advanced and versatile machinery, making mechanical recycling a complex operation.

Figure 16: Limitations in technology and related Infrastructure



[47] McKinsey & Company and Global Fashion Agenda, 2021. Scaling Circularity: Lessons learned from the Circular Fashion Partnership for building pre-competitive collaborations to scale upstream circular fashion systems.

Inefficient Sorting and Processing Systems: Automation in sorting textile waste and pre-treatment remains underdeveloped. Manual sorting of Jhut (fabric waste) is labor-intensive, inefficient, and prone to errors. This leads to lower recovery rates and reduces the quality of recycled materials. Inadequate quality control mechanisms and the absence of standardized processes can lead to inconsistencies in recycled materials, making it challenging for manufacturers to incorporate them into their production cycles. Proper mechanization or digitization of sorting processes could enhance efficiency and reduce contamination in the recycling stream.

The pre-treatment stage in mechanical recycling involves removing non-textile components such as buttons, zippers, and coatings, which is both labor-intensive and costly. Manual removal of these parts can lead to significant material loss, while automated systems require substantial investment. Metallic parts can damage machinery and even pose fire hazards, while coatings and prints can contaminate the final output. Additionally, heavily soiled textiles may need industrial washing or sanitation, adding further complexity and cost to the process.

Lack of Advanced Recycling Technologies: The absence of technologies that can handle mixed fabrics, especially those containing synthetic and non-cotton materials, is a significant barrier. Chemical recycling, which offers higher-quality outputs, is far more technologically complex and expensive. For processes like polymer pulping (used for recycling cotton) or depolymerization (for PET and nylon), precise chemical treatments are required to break down textile waste into reusable raw materials. Polycotton blends present a particular challenge, as separating the cellulose from cotton and the synthetic PET requires multi-step chemical treatments under specific conditions (e.g., high temperature and pressure), which are both energy-intensive and costly. Moreover, the presence of dyes, finishes, and other contaminants necessitates additional purification processes to ensure the quality of the recycled output. This raises both operational costs and environmental impact. Furthermore, these chemical processes are not widely implemented in Bangladesh due to the high initial investment in infrastructure, lack of technical expertise, and the need for consistent high-quality feedstock. Without advanced technology, most chemical recycling is not feasible, leaving Bangladesh to rely on less efficient methods or export textile waste for recycling abroad.

Lack of Capacity Building and R&D initiatives: A critical aspect of technological advancement in the circular economy sector is the training and capacity building of the workforce. Many workers in recycling and waste management lack the necessary skills and knowledge to operate modern machinery or employ sophisticated recycling techniques. The absence of comprehensive training facilities and programs exacerbates this issue. Additionally, the lack of research and development initiatives in this sector hinders the identification and implementation of innovative solutions. Upgrading and modernizing recycling facilities and implementing innovative technologies often require significant capital investments. Many businesses, especially those in the informal sector, face financial constraints that prevent them from making these necessary technological upgrades.

Lack of policy support to scale innovation: Innovative practices, particularly those involving renewable and biodegradable sources including hemp, bamboo, pineapple and banana leaves, are showing great potential in make a wide range of varied textile industry goods. These biodegradable textiles have fewer adverse effects on the environment than their non-biodegradable alternatives and can help

lessen the overall environmental footprint of Bangladesh's apparel sector while enhancing its image globally[48]. Although there are some sporadic developments taking place signaling its market potential, overall production and awareness are limited to a few firms. Bridging this gap in awareness & capacity necessitates support and collaboration, with the government playing a crucial role in creating a conducive environment for investment and the growth of startups focused on sustainable materials. There are also challenges in meeting high standards and price differential with traditional non-biodegradable alternatives, which require increased research, education, and cooperation among stakeholders. Lack of facilitative policies, targeted incentives, and necessary infrastructure impede the commercialization and widespread adoption of these innovations.

3.1.1. Access to Renewable Energy:

The transition to renewable energy is crucial for enhancing the sustainability and circularity of Bangladesh's apparel sector. As a key global player in the textile and RMG (Ready-Made Garments) industry, Bangladesh must reduce its reliance on non-renewable energy sources to align with the growing demand for sustainable practices from international buyers. Currently, renewable energy constitutes only 4.5 percent of the total installed power capacity in the country, amounting to 1,378.66 MW out of a total 30,869 MW[49]. This limited availability of clean energy options, combined with insufficient investment in the sector, poses a significant challenge to the growth of a circular economy within the industry.

Bangladesh has set an ambitious target to achieve 40% of its energy generation from renewable sources by 2041, as outlined in the Integrated Energy and Power Master Plan (IEPMP) 2023. According to IEPMP, Bangladesh aims to become a "Decarbonization-ready" country by 2050 and reach the eventual achievement of carbon neutrality in 2070. By 2041, the plan is to reduce fossil fuel dependency to below 60% in the power generation mix[50]. To meet this goal, the country must invest up to US$29.07 billion over the next 17 years. However, the current investment levels are far from adequate. In the fiscal year 2024, only 2.4 percent of the Annual Development Program (ADP) allocation for the power and energy sector was directed towards renewable energy. This underinvestment hinders Bangladesh's and apparel sector's ability to lower its carbon footprint.

The urgency of this transition is underscored by the sustainability commitments made by major international brands. Companies like H&M and Levi's have set ambitious targets to become climate-positive and net-zero by 2040 and 2050, respectively. For these goals to be realized, significant reductions in greenhouse gas emissions must occur in production countries, which accounts for 60% of these brands' emissions[51]. In Bangladesh, production processes continue to rely heavily on non-renewable energy sources, which undermine sustainability efforts despite the use of recycled materials. The industry must focus on process innovations that reduce energy, water, and chemical usage while simultaneously addressing the dependency on fossil fuels and an unstable energy grid. Without substantial changes to the energy ecosystem, Bangladesh risks losing its competitiveness in the global market as more buyers prioritize green and sustainable sourcing.

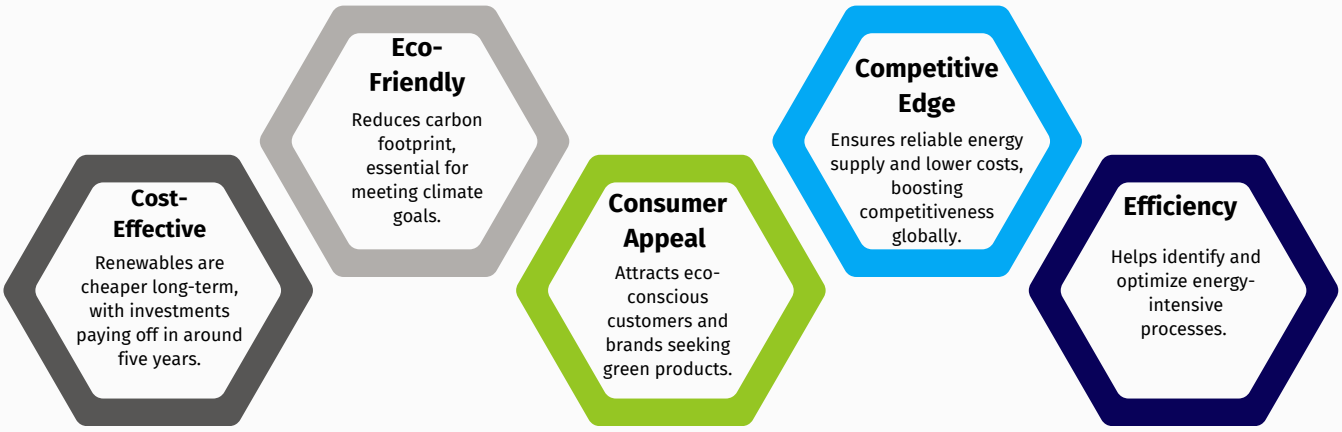
[48] Textile Focus, 2024. Available at: https://textilefocus.com/biodegradable-textile-and-bangladesh-an-eco-friendly-alternative-for-the-textile-industry/
[49] Electricity Generation Mix | National Database of Renewable Energy.
[50] Integrated Energy and Power Master Plan (IEPMP) 2023.
[51] Lightcastle Partners, 20024. The Renewable Energy Imperative in Bangladesh: An Apparel Industry Perspective.

Despite these challenges, there are promising developments and initiatives within the sector. The government has recognized the potential of solar energy and is prioritizing it for the long term. Given the constraints in securing land for large-scale solar parks, there is a shift towards rooftop solar systems and decentralized renewable energy solutions, such as net metering and floating solar technologies. These innovations are still in their early stages, requiring further research and investment to reach their full potential. Additionally, the adoption of the "Net Metering Policy" in 2018 has encouraged the growth of captive power generation through solar energy in RMG factories, which allows excess energy to be fed back into the grid in exchange for credits on electricity bills. Firms with sustainable operations can also receive a 2% tax benefit.

Bangladesh's leading apparel manufacturers are leading the way by investing heavily in renewable energy, particularly rooftop solar. Plummy Fashions, with its LEED Platinum-certified facility, is integrating solar panels that supply 13% of the factory's total energy needs and implementing energy-saving measures that cut power consumption by 50%[52]. DBL Group has also implemented roof-top solar energy to reduce fuel consumption and GHG emissions. Till the end of 2023, DBL had managed to install 5.03 MW of solar panels which reduced diesel consumption by over 1 million liters per year and prevented 6,090 tons of CO2 emissions annually.

DBL Group has also introduced various industry-level innovations that led to energy and cost savings which other RMG and textile producers can replicate. Their condensed water recovery system at diesel and gas boilers has saved over 1 million liters of diesel and around 500,000 cubic meters of gas respectively, besides preventing 3,765 tons of GHG emission and saving around $900,000 annually. Heat and hot water recovery systems have also saved tremendous amounts of energy— 6.27 million MJ of energy was saved annually from the heat recovery in stenter machines through Eco Booster besides $416,000 saved, while over 1 million Liters of diesel and $854,100 was saved from hot water recovery. These efforts, combined with the increasing interest of RMG producers in adopting green production methods, indicate a positive trend toward sustainability. However, the sector needs to scale up these practices and overcome barriers such as the limited space for solar installations in vertically expanding factories and the need for more efficient solar technologies.

Figure 17: Benefits of shifting to renewable energy sources

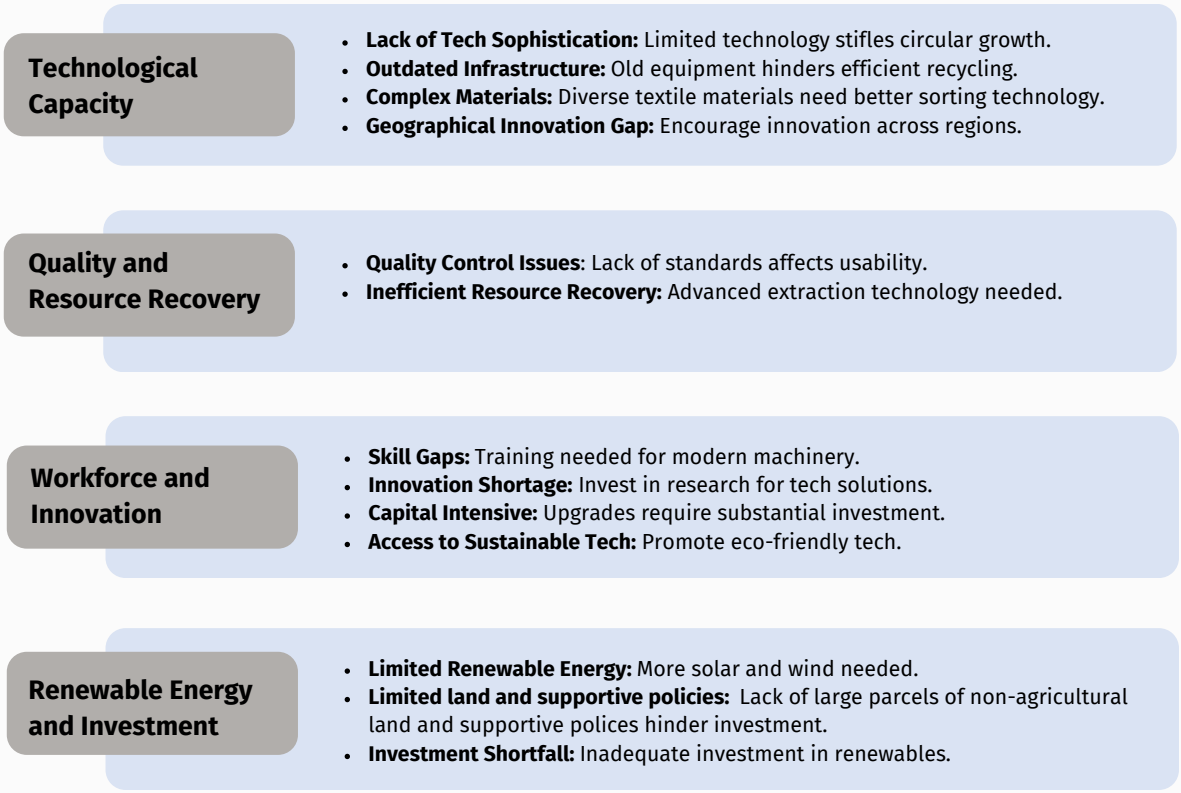


[52] Adam Smith International, 2018. Environmental Compliance Opportunities in the Bangladeshi Ready Made Garments Industry: Lessons from the Green High Achievers. Available at: https://www.greenpolicyplatform.org/sites/default/files/downloads/resource/EDGG+Paper+8+Green+Compliance+in+RMGdf

Bangladesh, however, still faces several complex challenges in its transition to renewable energy, particularly in the textile and RMG sectors. One of the primary hurdles is the limited availability of land, which restricts the establishment of large-scale solar parks and wind farms. As a result, the focus has shifted to rooftop solar systems and decentralized renewable energy solutions, yet these alternatives also require significant investment in advanced technology and infrastructure. The substantial financial requirements for developing renewable energy infrastructure are daunting both at country and firm level, since most of the textile & RMG producers that operate sub-contractually, lack technological capacity and awareness of advantages and financing mechanisms available.

In addition to financial and land constraints, additional challenges are hindering the transition to renewable energy. The existing meter standards in Bangladesh require revision to accommodate evolving net-metering requirements and to enhance data security. Addressing the risks associated with meter manipulation is crucial to maintaining the integrity of energy data and ensuring the effectiveness of renewable energy systems. Policy actions must be strategically aligned with the national vision outlined in the Integrated Energy and Power Master Plan from 2023[53] and other key frameworks to support a cohesive approach towards energy transition. Furthermore, there is a pressing need for consensus on standardizing definitions, methodologies, and metrics for renewable energy and sustainability efforts across the industry. Such alignment would enable better coordination among stakeholders, facilitate investment, and ensure that initiatives are consistent with the country's long-term sustainability goals. Overcoming these multifaceted challenges will be essential for Bangladesh to fully realize the potential of renewable energy and maintain its competitiveness in the global apparel market.

Figure 18: Challenges related to technology and infrastructure



[53] Integrated Energy and Power Master Plan (IEPMP) 2023
https://powerdivision.portal.gov.bd/sites/default/files/files/powerdivision.portal.gov.bd/page/4f81bf4d_1180_4c53_b27c_8fa0eb11e2c1/IEPMP%202023.pdf

3.4 Large Investments Required for Non-Cotton and Post-Use Recycling

Recycling waste materials demands significant investments in advanced technologies and machinery, rendering it a capital-intensive undertaking. While this substantial financial requirement can serve as a deterrent, especially for smaller enterprises, the coexistence of informality and uncertainties regarding return on investment can further dissuade prospective investors from venturing into the industry. The broader investment climate challenges in Bangladesh, compounded by informality and ambiguity, contribute to a decrease in investor confidence. Additionally, the absence of incentives that promote circular practices, both at the policy and industry levels, acts as an additional disincentive for businesses to engage in waste recycling. This perceived lack of commercial viability plays a pivotal role in impeding technology investments within the circular economy sector.

- **Capital-Intensive Machinery and Limited Access to Financing:** Recycling materials beyond cotton demands expensive, specialized machinery. Securing financing for such machinery is often a major hurdle for recycling facilities, particularly startups. Limited access to loans and funding hinders their ability to invest in sustainable practices.

- **High Research and Development (R&D) Costs and Technical Expertise:** Developing innovative recycling technologies for non-cotton materials, such as synthetic fibers or blended fabrics, can incur substantial R&D expenses. This financial burden is often beyond the means of smaller recycling firms. Additionally, operating and maintaining such machinery requires specialized technical knowledge, posing recruitment and training challenges.

- **Efficiency and Environmental Compliance:** Achieving high levels of efficiency in the recycling process, especially for non-cotton materials, can be resource-intensive. Continuous improvements and optimization efforts demand ongoing investments. Moreover, meeting stringent environmental standards for non-cotton recycling often requires additional investments in pollution control and waste management systems.

- **R&D for Sustainable Alternatives and Infrastructure Development:** As the industry seeks sustainable alternatives to synthetic fibers, investing in R&D for new materials can be costly and uncertain. Simultaneously, developing the necessary infrastructure, including transportation and storage facilities for collected waste, can require substantial upfront investments. For instance, Jinnat Knitwears Limited, a subsidiary of DBL Group had invested around $ 2,395,240 as part of Partnership for Cleaner Textile (PaCT), an initiative of IFC supported by the Governments of Denmark, Australia, and the Netherlands. The investments were centered around cleaner energy (solar) and energy-efficient technologies (Hot water/ heat recovery), as well as recycling technologies and yarn innovations, which combined brought down their water, energy, and chemical consumption per kg of fabric.

- **The assessment and grading of sustainable investments and approaches in the textile and RMG sectors remain unclear, creating challenges for businesses and investors.** There is a significant lack of clarity regarding how to evaluate and grade sustainable investments and manufacturing practices. Establishing clear and standardized criteria for sustainability assessments can guide businesses and investors in making informed decisions. Brands and manufacturers should be willing to take calculated risks by piloting newer materials and sustainable technologies. Embracing innovation and supporting innovators are essential steps toward achieving scalability in circular practices.

3.5 Political Economy Issues

Recyclers in Bangladesh face a pressing challenge related to the scarcity of recyclable cotton waste. This scarcity is primarily driven by the export of such waste to foreign countries, resulting in significant resource depletion within the nation and missed opportunities for sustainable recycling. Currently, an estimated 300 traders actively engage in the export of waste materials to various international destinations in pursuit of higher profits. This export-oriented practice not only contributes to the outflow of valuable resources from Bangladesh but also underscores the urgent need for a more organized, structured, and formal approach to waste management. The informal nature of the existing waste management system poses considerable difficulties for recyclers across the country. It's worth noting that waste management practices in South Asia often operate within a somewhat opaque and protected environment influenced by vested interests. In this context, recyclers find themselves compelled to establish political affiliations to secure their positions within this challenging landscape. This reliance on political connections unfortunately becomes a necessary requirement for recyclers to sustain their operations.

The involvement of local political figures in the garments waste recycling sector adds a layer of complexity. While this involvement can provide a degree of organization to the informal sector, it also introduces political pressures and influence into the business. Any formalization or regulation of this sector should carefully address these political dynamics to ensure a smooth transition toward circular practices.

Additional political economy issues around exporting waste materials reflect the complexity of the circular textile and RMG sector. There are vested interests that oppose the discontinuation of waste exports, fearing the potential consequences, such as a fall in prices. When waste exports cease, larger companies may take advantage of the situation, potentially leaving SMEs behind. To ensure the sector's sustainability, all firms must transition to circular practices gradually. Achieving this transition requires a market-driven approach, where incentives align the interests of businesses, buyers, and policymakers. While some advocate for a complete ban on the export of garment waste to preserve raw materials and mitigate pollution concerns, this approach may not be justifiable, as Bangladeshi recyclers often lack the capacity and technical know-how to process complex waste types. Banning exports could inadvertently lead to more than half of non-cotton waste ending up in landfills, which is far from an ideal solution. A market-driven, gradual transition toward circularity is essential for sustainable and equitable progress in the sector.

3.6 Lack of Comprehensive Policy Framework

The absence of an overarching, comprehensive policy framework governing waste management in Bangladesh's textile sector presents a critical barrier to transitioning towards circularity. Currently, the country lacks a cohesive national strategy that effectively addresses the management of post-industrial textile waste, commonly referred to as jhut. Although there are existing pieces of legislation such as the Environment Conservation Act of 1995 and the Solid Waste Management Rules, these are fragmented and fail to provide the comprehensive approach needed to regulate and promote circular waste practices within the sector.

One of the primary consequences of this regulatory gap is the dominance of the informal sector in textile waste management. Without a clear framework defining and governing the circular use of waste resources—such as reducing, reusing, recycling, upcycling, and recovering—informal actors continue to operate with limited oversight, often managing waste through inefficient or environmentally harmful practices. Informality further complicates efforts to enforce sustainable waste practices, as it often leads to unsafe working conditions, inconsistent waste handling standards, and limited traceability of waste materials. The absence of a clear legal and policy structure exacerbates these challenges, making it difficult to formalize the sector and integrate it into the broader circular economy framework. As a result, industries and brands are left to navigate a confusing mix of regulations, which often results in inconsistent practices in waste management and circularity.

Moreover, the lack of a comprehensive policy framework also stifles investment in the circular economy. Investors are hesitant to finance recycling infrastructure, waste management technologies, or circular business models due to the unclear regulatory environment. In contrast to countries with robust and comprehensive circular economy guidelines & policies such as Thailand & Cambodia[54], Bangladesh's fragmented policy landscape does not offer the same level of certainty or incentive, thus creating a barrier to the large-scale investments needed to develop the necessary infrastructure for circular textile practices.

[54] International Circular Economy Policy Trends: Implications for Bangladesh. Switch to Circular Economy Value Chains. Available at: https://www.switchtocircular.eu/publication/international-circular-economy-policy-trends-implications-Bangladesh

4. Current state of Policies in Bangladesh Textile & RMG Sector

4.1. Overview of the Policy Environment in Bangladesh

Bangladesh has established several policies and legal frameworks to address environmental concerns and waste management, even though they may not be entirely tailored to circularity.

4.1.1. Environmental Conservation Act 1995

Bangladesh's commitment to environmental protection dates back to the adoption of the Environment Policy and Environment Action Plan in 1992. Consequently, the Environmental Conservation Act of 1995 (ECA)[55] serves as a key legislative framework concerning environmental protection. Amended in 2000, 2002, and in 2010, it encompasses guidelines for vehicle emissions, environmental clearance for industrial projects, regulations for industries and improvement actions, discharge permits, quality standards for air, water, noise, and soil, and measures for waste discharge and emissions control. This act grants the Department of Environment the authority to shut down activities deemed harmful to human life or the environment.

Despite being Bangladesh's principal legislation for environmental protection and pollution control, ECA's provisions have not yet been specifically applied to the jhut or textile waste sector. Governed by the Ministry of Environment and Forest (MoEF), the Act focuses on environmental conservation, enhancing environmental standards, and addressing environmental degradation. The Act defines "waste" as any solid, liquid, gaseous, or radioactive substance whose discharge, disposal, or dumping could harm the environment. This definition would encompass mismanaged jhut waste. Additionally, the Act mandates that environmental factors must be considered before the establishment of any industrial operation (Section 12).

Key elements of ECA that could influence jhut management include: the requirement for prior environmental clearance, regulation of industrial waste, setting waste discharge and emission standards, and mechanisms to enforce environmental justice. It also includes provisions for remedial actions for damage caused to ecosystems and outlines penalties for companies that violate its provisions (Section 16). Lastly, the Act grants the government the authority to create regulations (Section 20) concerning industrial activities, which could be extended to cover jhut collection, recycling, and processing activities within the textile sector[56].

4.1.2. National Environmental Policy 2018

The National Environmental Policy 2018 marks a key step forward in aligning Bangladesh with international legal standards for waste management, environmental protection, and sustainable development. The policy focuses on addressing climate change, enhancing environmental preservation, and promoting the circular economy and Sustainable Development Goals (SDGs) within the country's context. It provides a supportive framework for integrating circularity into garment manufacturing and Jhut waste management, following the principles of a circular economy.

[55] https://bangladeshbiosafety.org/wpcontent/uploads/2017/05/Bangladesh_Environmental_Conservation_Act_1995.pdf
[56] GIZ, 2024. Study for a Regulatory Framework to Enable Recycling of Post-Industrial Waste (JHUT) for the RMG Industry in Bangladesh.

4.1.3. Environmental Conservation Rules 2023

Additionally, the Environmental Conservation Rules 2023 provide specific standards for waste disposal, primarily focusing on industrial waste. These standards encompass various aspects of industrial from textile-related facilities, to minimize environmental impacts and ensure responsible waste management. According to these rules, *jhut* processing and recycling industries are required to obtain an Environmental Clearance Certificate (ECC) from the Department of Environment (DoE) prior to operation, which applies to all categories of industrial establishments. For industries categorized as "Orange" (moderately polluting) and "Red" (highly polluting), the submission of an Environmental Management Plan (EMP) is mandatory as part of this certification process.

Figure 19: Bangladesh's Circular Policy Snapshot

While small-scale jhut processing enterprises, run by family members with investments up to BDT 5 lakh, are exempt from obtaining an ECC, larger and more formal operations face stricter requirements. Red category industries, identified as posing serious risks to public health and the environment, must conduct an Environmental Impact Assessment (EIA) before establishment. Industries producing recycled fiber are exempt from the EIA requirement, as they fall under the Orange category. However, there is ambiguity in the law regarding whether jhut enterprises specifically need to carry out EIAs, as the legislation does not explicitly mandate it for them. The unclear nature of these provisions, particularly concerning the handling, processing, and disposal of hazardous jhut waste, raises concerns about whether appropriate environmental safeguards are being applied to the jhut supply chain, which remains largely informal, unorganized, and unregulated.

4.1.4 .Bangladesh Labor Act, 2006 (Amended in 2023)

The Labour Act can support decent working conditions in jhut management. The Bangladesh Labour Act 2006 is a key piece of domestic legislation aimed at protecting workers' rights. With amendments approved in November 2023, the law now aligns more closely with International Labour Organization (ILO) standards. Regarding textile waste management, the law mandates that every garment factory must implement proper waste disposal mechanisms for jhut and other industrial effluents, subject to approval by the relevant government authorities, such as the Department of Environment (Sections 54, 351). It also requires that jhut traders and recyclers maintain cleanliness (Section 51) and prevent harmful dust and fumes during the sorting, processing, and segregation of waste materials (Section 53).

Despite its potential, enforcement of its provisions related to textile waste management, particularly jhut (fabric waste), remains weak. In theory, these provisions could reduce the environmental impact of textile waste, but in practice, they are not adequately enforced. The law also encourages factories to form Participation Committees, which can play a role in reducing waste through collaboration between employers and workers (Section 206). However, without proper implementation and enforcement, these legal requirements fail to deliver their intended environmental and social benefits, leaving waste management in the textile sector largely unregulated and informal.

Table 1: Additional provisions relevant to circularity in textiles:

Provision	Description
Protection for Young Workers	Section 34 of the Bangladesh Labour Act 2006 prohibits employment of children and adolescents without a medical fitness certificate. Exceptions for apprenticeships and training.
General Occupational Safety and Health (OSH) Measures	Chapter V outlines health and hygiene requirements, including Section 51 (Cleanliness), Section 53 (Prevention of Dust and Fumes), and Section 54 (Disposal of Wastes and Effluents).
Social Security for Young Workers	Section 41 regulates working hours for adolescent workers, limiting shifts to two per day (max 7.5 hours each) and capping weekly hours. Overtime restrictions and mandatory holidays.
Prohibition of Hazardous Work for Minors	Section 39 prohibits adolescents from hazardous work, with specific emphasis on preventing their involvement in risky fabric waste management tasks in informal sectors.

Source: GIZ (2024) Study for a Regulatory Framework to Enable Recycling of Post-Industrial Waste (JHUT) for the RMG Industry in Bangladesh.

The concept of waste management in Bangladesh has evolved over time, aligning with international principles such as the 3R (Reduce, Reuse, Recycle) approach. The 3R initiative aims to advance these principles globally, focusing on reducing waste generation as the top priority, followed by reuse and recycling.

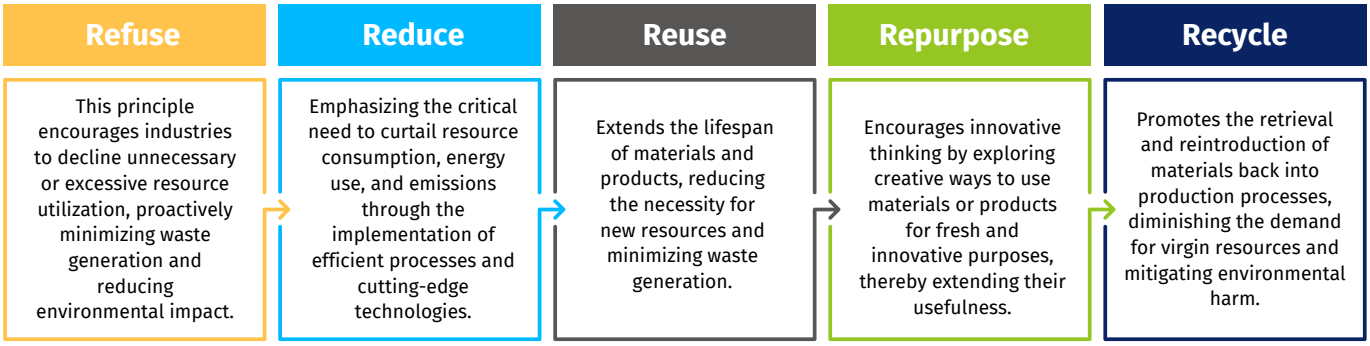
4.1.5 The 5R Approach in Industrial Policy

The National Industrial Policy 2016 reinforces the importance of eco-friendly industrial waste management and emphasizes conducting Environmental Impact Assessments, promoting awareness, establishing Effluent Treatment Plants (ETP), and encouraging the 3R (Reduce, Reuse, Recycle) strategy among industrial entrepreneurs.

The 2022 industrial policy of Bangladesh presents a framework that supports recycling and circularity initiatives within the country's industrial landscape. It outlines several key provisions aimed at promoting sustainability and environmental responsibility. These provisions include incentives for setting up Effluent Treatment Plants (ETPs) and Common Effluent Treatment Plants (CETPs), the establishment of dumping yards for solid waste, and encouragement for entrepreneurs to adopt the 5Rs strategy (Refuse, Reduce, Reuse, Repurpose, and Recycle) in their businesses. The policy also supports the import of eco-friendly machinery and technology while promoting the export of eco-friendly products.

Aligned with the overarching theme of fostering environmentally responsible industrial practices and effective waste management, the Industrial Policy of 2022 introduces a pivotal strategy: the "5R" approach. This strategy calls upon industrial entrepreneurs to embrace the comprehensive principles of Refuse, Reduce, Reuse, Repurpose, and Recycle.

Figure 20: 5R's in Industrial Policy



By actively endorsing the adoption of the 5R strategy, the Industrial Policy of 2022 aligns industrial activities with principles of sustainability and environmental responsibility. This strategic framework not only safeguards the environment but also bolsters long-term economic viability and cultivates harmonious industrial growth. While these measures represent a positive step toward circularity and waste management, further enhancements could be made to provide more specific and targeted support for the textile and apparel sector, which plays a significant role in Bangladesh's economy, to accelerate its transition towards circular and sustainable practices.

Informal sector in the industrial policy

The National Industrial Policy 2022 of Bangladesh includes provisions for the informal sector, aiming to integrate it into the formal economy. It proposes creating a national database and a five-year action plan (2022-2027) to develop the sector, covering activities like domestic work, street vending, and waste picking. Informal entrepreneurs registered in this database will receive Micro, Small & Medium Enterprise (MSME) certification following online training. While the action plan is yet to be developed, its inclusion into the industrial policy provides a solid ground for its development and implementation. The policy also emphasizes enhancing productivity through training programs and offers tax incentives to attract investment in underdeveloped areas, promoting sustainable and compliant industry practices.

4.1.6. Solid Waste Management Rules 2021

Solid Waste Management Rules 2021 discusses various regulations related to the management of solid waste, including guidelines for recycling and circularity in the textile and RMG sectors. It covers waste segregation, collection, transportation, treatment, and disposal, emphasizing the importance of recycling and reuse to minimize landfill waste. Specific rules specify that waste segregation at the source should be sorted into recyclable and non-recyclable categories. It encourages the use of recycling facilities for industrial waste, highlighting that businesses should prioritize recycling to minimize environmental impact and details restrictions on landfill disposal, stating that recyclable materials, including textile waste, should not be disposed of in landfills unless all recycling options are exhausted.

4.1.7. Green Banking Guidelines

Bangladesh has made significant strides in promoting environmentally responsible banking practices, with Bangladesh Bank taking the lead. The journey began with the issuance of the Green Banking Policy Guideline for Banks in 2012, which was subsequently extended to cover Financial Institutions (FIs) in 2013. These guidelines established a structured reporting system for all banks and FIs.

Bangladesh Bank's growing commitment to sustainability and environmental responsibility reflected in its proactive policy-making. To accelerate the integration of green practices, Bangladesh Bank introduced a minimum target for direct green finance, set at 5% of the total funded loan disbursement or investment for all banks and FIs, effective from January 2016. This mandate has compelled financial institutions to allocate a substantial portion of their resources to green initiatives, which encompass a wide range of environmentally friendly projects. Furthermore, Bangladesh Bank instructed all banks and FIs to establish Sustainable Finance Units and Sustainable Finance Committees, replacing the earlier Green Banking and Corporate Social Responsibility (CSR) units. This organizational restructuring reflects the growing commitment to sustainability and reinforces the importance of environmental responsibility in financial decision-making.

Bangladesh Bank's risk management tools have empowered banks and FIs to evaluate environmental and social risks associated with investments, including the apparel sector. Recognizing the need to address environmental risk comprehensively, Bangladesh Bank issued Environmental Risk Management (ERM) Guidelines in 2011. These guidelines were updated in 2017 with the issuance of Environmental and Social Risk Management (ESRM) Guidelines, accompanied by a Risk Rating Model that became enforceable from January 1, 2018. Bangladesh Bank's ESRM Guidelines aim to integrate sustainability into the credit management practices of banks and financial institutions. Issued in February 2017 and updated in 2022, these guidelines expand upon earlier Environmental Risk Management protocols by incorporating social risk parameters alongside environmental assessments. They offer a structured framework, including guidance notes for ten specific sectors, including the Textile and Apparel Sector, to enhance the objectivity and effectiveness of risk evaluations. The guidance note mentions that solid and liquid wastes generated in textile industries should be effectively recycled or reused within the process or external activities (e.g. waste fibers, cuttings, and trimmings can be recycled as a feedstock for other operations, including low-grade products non-woven, insulation etc.).

4.2. Existing and Emerging Gaps in Policy Landscape for Embracing Circularity

Despite having multiple environmental conservation laws with directives on waste, Bangladesh faces issue in implementing them. Local governments and industries, although willing to align with these policies, face significant challenges. The scarcity of suitable land for sanitary landfill sites in densely populated urban areas poses a considerable problem. Furthermore, the absence of a secure landfill for hazardous industrial waste and a lack of facilities for its treatment and recycling compound environmental challenges. While some laws and policies, such as the Environment Conservation Act of 1995, include provisions for the reduction and control of waste emissions, they do not provide a comprehensive national strategy for addressing waste disposal. Incentives or support for Cleaner Production (CP) practices and guidelines for municipal solid waste management are also currently absent. This deficiency, coupled with factors like a lack of motivation, awareness, suitable technology, and financial support, has resulted in a substantial portion of waste not being properly stored, collected, or disposed of in designated areas.

While Bangladesh has made strides in environmental protection and waste management, circular economy principles remain less emphasized in its policies. Currently, Bangladesh lacks an overarching circular economy strategy and action plan, despite the pressing need for such measures. Recycling apparel waste and plastic waste can not only boost competitiveness but also reduce the reliance on raw material imports and create job opportunities. However, the success of transitioning to circular economy in Bangladesh hinges on unwavering government commitment and robust financial support. Delaying the conversion of waste into exportable products could result in future economic losses. While some South Asian countries have already embarked on the circular economy journey, Bangladesh must follow suit to remain competitive in the global trade landscape.

Figure 21: Challenges and Opportunities in Circular Policy Implementation

4.2.1. Lack of Clear and Overarching Policy Direction

A significant challenge in the transition to circular practices in the textile and RMG sector in Bangladesh is the absence of a clear policy direction and a centralized policy framework for circular economy activities. This lack of policy coherence creates uncertainty and confusion among stakeholders, hindering the development of a cohesive and coordinated approach to circularity. The lack of policy direction has several implications. It makes it difficult for industry players to align their strategies and investments with a unified vision for circular practices. In the absence of clear policies, there is uncertainty about which circular initiatives should be prioritized and how they should be implemented. This can lead to inefficiencies in resource allocation and a fragmented approach to circularity within the sector.

The absence of clear policy direction can slow down the adoption of circular practices. Without a coordinated and coherent policy framework, it becomes challenging to set specific goals and targets for circularity, which are essential for driving progress. Additionally, the lack of incentives and guidance from policies can make it less attractive for businesses to invest in circular initiatives.

To address this challenge, Bangladesh should develop a clear and comprehensive policy framework for circular economy activities within the textile and RMG sector. This framework should consolidate all policy initiatives and relevant stakeholders, with one ministry possibly taking charge of overarching coordination to streamline policy implementation and fostering coherence across various circularity programs. To facilitate this, it is essential to engage in public-private dialogues to sensitize the government about the importance of circularity and its potential benefits, such as reducing dependence on raw and recycled cotton imports, foreign exchange savings and formal green job creation. Alternative incentives, beyond tax incentives, should also be explored to encourage circular practices, and these discussions should pave the way for a more conducive circular economy environment in Bangladesh's textile and RMG sector.

4.2.2. Challenges in Regulatory Framework

Formalizing the Informal Waste Management Sector:

Bangladesh lacks specific regulations and incentives to formalize this informal waste management sector. The management of textile waste in Bangladesh relies on informal traders operating in inefficient networks. However, Bangladesh lacks specific regulations and incentives to formalize this informal waste management sector. There are no clear waste management standards, along with gaps in fair wages, and labor rights for workers in this sector. Additionally, there are no clear measures to ensure accountability and traceability of waste flows to improve circularity efforts. Manufacturers struggle to control their waste flows due to territorial and politically influenced informal traders. The informal handling of waste leads to convoluted routes and high contamination levels, rendering the waste unsuitable for emerging recycling technologies. Furthermore, the informal nature of this sector makes it difficult to ensure fair wages, labor rights, accountability, and traceability. Without formalization efforts supported by clear regulations, guidelines, and incentives, inefficiencies persist, disincentivizing investments and obstructing the transition to a circular economy.

Lack of recognition and guidelines for informal workers

The Labour Act 2006 in Bangladesh does not extend protections to informal workers, including those in textile waste management. Women and adolescent girls employed in informal Jhut processing are particularly vulnerable, as these enterprises lack formal recognition and compliance with national laws. The circular economy offers a pathway to formalizing this sector and creating jobs, aligning with the National Social Security Strategy (NSSS), the 8th Five-Year Plan, and the Bangladesh Labour Act 2006. However, all workers involved in the Jhut value chain must be covered by national labor laws for inclusivity.

Currently, no proper guidelines for workers in waste management sectors exist. As a result, companies working to sort out textile waste, have to instill their guidelines and look for ways to get certified. This ultimately means it is dependent on the owner's motivation, rather than push due to requirements, which means many can choose to not provide better working conditions for textile waste handlers. Moreover, because of the presence of multiple vested interest groups in the waste management sector, operating here is a major challenge with high-risk elements.

Establishing a Common Understanding of Waste and its Ownership:

Bangladesh's regulatory framework lacks clear criteria for when textile scraps, or Jhut, cease to be considered waste and become a valuable product. While Jhut is a waste in factories, its trajectory through traders and recycling mills shows it has a significant market value. The National Board of Revenue (NBR) views Jhut as waste, imposing a high VAT rate of 7.5% on its purchase and 15% when selling, while other government bodies consider it a product for recycling. This inconsistency leads to confusion over Jhut's legal status and hinders its potential in the emerging recycling sector.

The growing awareness of the value of textile waste has sparked discussions on waste ownership among manufacturers, brands, and recyclers. The issue of waste ownership in Bangladesh’s textile and RMG sector is complex and generates differing opinions among stakeholders. While BGMEA asserts

that international brands bear ownership of waste generated in production, suggesting that these brands should assume accountability and contribute financially to waste management and circular solutions. Brands, however, often maintain that their role ends with purchasing the finished product, distancing themselves from responsibility for production waste. This divergence in views creates ambiguity in ownership, complicating efforts to allocate responsibility, implement effective recycling practices, and invest in sustainable waste solutions across the sector.

Presently, there are no established policies or regulations defining waste ownership or criteria for successful circular commercial collaborations. The informality in Bangladesh's Jhut supply chain is largely due to the absence of formal contracts in the sale and transaction of Jhut materials. Transactions between garment manufacturers, collectors, and traders lack legal documentation under laws such as the Contract Act 1872 and the Sale of Goods Act 1930. The ownership of Jhut is retained by factory owners until disposal, but practices like landfill dumping raise issues of abandonment and transfer of ownership as per the principle of abandonment[57], the principle of accession [58] suggests that combined waste ownership could shift to the party that adds value to the materials. The absence of a common understanding of waste ownership and collaboration criteria poses challenges to fairly distributing value and accelerating circular initiatives. Without clear policies or guidelines, disputes may arise between stakeholders, hindering progress toward a circular economy[59].

Lack of incentives for recycling in Bangladesh:

The current regulatory framework in Bangladesh lacks sufficient incentives to promote waste recycling, with the imposition of a 7.5% VAT on the collection and sale of textile waste by spinning mills acting as a significant deterrent. While there are no legal barriers to selling Jhut from export-oriented RMG industries, VAT laws impose a burden on the Jhut recycling industry, with a combined VAT rate of 22.5% on Jhut transactions[60]. This tax burden not only increases the cost of recycled fibres but also contradicts government policies aimed at enhancing sustainability and circularity in the textile sector. While the government has considered withdrawing VAT to support the recycling industry, concrete steps are yet to be taken. While the government has reduced supplementary duty for silk wastes for specific few product categories[61], the total tax incidence for those products are still exuberantly high at 100%[62]. Customs tariff for cotton and other forms of fabric waste (except silk) ranges from 10% to 58.6%. The existing tax structure discourages investment in recycling, thereby impeding the development of a robust circular economy.

While the 2022 industrial policy of Bangladesh demonstrates a commitment to environmental responsibility and sustainability, there are notable gaps concerning circularity, especially in the context of the textile and apparel sector. The policy could benefit from a more sector-specific approach, providing tailored incentives and regulations to encourage circular practices in the textile industry. Specific measures, such as promoting the recycling of textile waste and establishing clear guidelines for incorporating circular principles, could be more explicitly outlined. Additionally, there is room for enhancing transparency and accountability mechanisms to track progress and ensure that circularity goals are met effectively. Overall, further detailing and prioritizing circular economy strategies within the industrial policy could significantly strengthen its impact on sustainability in Bangladesh's industrial sectors.

[57] The principle of abandonment connotes that an owner must take clear, decisive action that indicates he no longer wants his property. Any act indicating the owner's intention to relinquish property is sufficient to constitute abandonment provided the property is left free and open to anyone who comes along to claim it. See, Julia Kagan (2022),"Abandonment Clause: What It Means, How It Works",
[58] "Property Law Outline - Principle of Accession", OneLBriefs; URL: www.onelbriefs.com/outlines/property/accession.htm; Thomas Merrill (2009),"Accession and Original Ownership", Journal of Legal Analysis, Vol-1:2 (Summer), at pp: 462-463.
[59] GIZ, 2024. Study for a Regulatory Framework to Enable Recycling of Post-Industrial Waste (JHUT) for the RMG Industry in Bangladesh.
[60] GIZ, 2024. Study for a Regulatory Framework to Enable Recycling of Post-Industrial Waste (JHUT) for the RMG Industry in Bangladesh.
[61] Budget Speech 2024-25.
[62] NBR. National Customs Tariff. FY 2024-25. https://customs.gov.bd/files/TRF_2024_2025_06062024.pdf

Providing Green Energy Alternatives to Textile Waste Incineration:

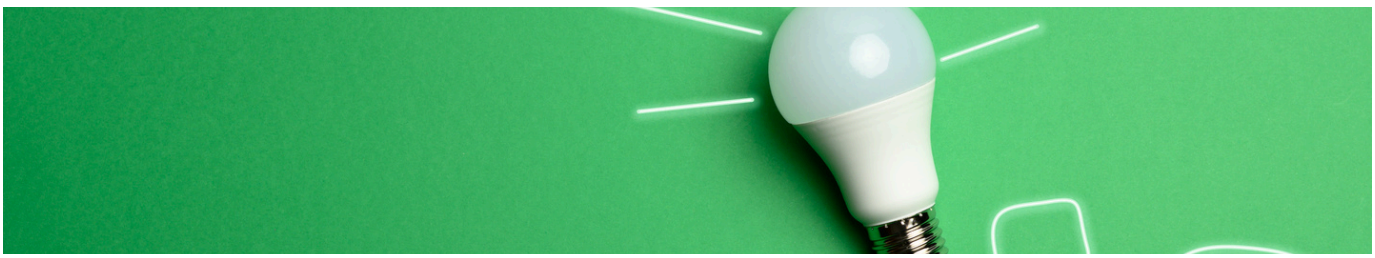
Many manufacturers in Bangladesh currently favor the incineration of textile waste as an energy source. Incineration of textile waste can release harmful emissions, including dioxins and furans, if not properly managed. Landfilling of textile waste, on the other hand, poses challenges due to its non-biodegradable nature, contributing to long-term environmental impacts. Bangladesh Standards and Guidelines for Sludge Management, 2015[63] emphasize strict environmental control measures when disposing of such wastes. For incineration, it is recommended to have proper facilities equipped with pollution control devices to prevent the release of harmful emissions like dioxins and furans. Monitoring of emissions and adherence to air quality standards is required. For landfilling, only non-hazardous textile waste should be disposed of in designated landfill sites. Proper segregation and treatment are recommended to reduce the environmental impact, and regular monitoring is necessary to ensure compliance with environmental standards.

There are no regulations promoting alternative, cleaner energy sources for textile waste, nor are there policies discouraging incineration. The preference for incinerating valuable textile waste as a cost-efficient energy source hinders recycling efforts and contradicts the fashion industry's circular economy goals. To shift incentives toward recycling and away from incineration, access to affordable, clean alternative fuels should be developed. Long-term considerations such as banning incineration or imposing taxes on it should be explored through energy and infrastructure investments and policy directives.

Cumbersome Regulatory Hurdles for Waste Material Import and Export

The presence of regulatory barriers can significantly impede the transition toward circular practices. Importing wastes for recycling faces several barriers, including lengthy processing times and the need for additional approvals from the National Board of Revenue (NBR). Circular economy principles rely on the efficient use of resources and waste reduction, both of which are hindered when waste materials cannot be traded and processed on time. These hurdles can deter investors from investing in circularity initiatives and disrupt the development of a more sustainable production and waste management ecosystem.

The new Import Policy Order for 2021-2024 in Bangladesh introduces several changes aimed at streamlining import procedures and promoting business-friendly practices. While the policy simplifies the import of raw materials and packaging products, including the potential import of waste for recycling and export, it lacks explicit mention of circularity or recycled clothing. Additionally, the reduction in the allowable limit of old clothes may affect the reusability and second-hand market. Although the policy includes measures to protect the environment by prohibiting certain plastic items, there is a missed opportunity to explicitly address circular economy principles and incentivize the import of recycled textiles or materials. [64]



[63] Bangladesh Standards and Guidelines for Sludge Management. Department of Environment. 2015.
[64] Ferdaus Ara Begum, 2022. Import Policy Order 2021-2024: An analysis. Available at: https://businesspostbd.com/opinion/import-policy-order-2021-2024-an-analysis-2022-07-23

To address this challenge, there is a need for streamlining trade processes for waste materials in the textile and RMG sector. This could involve creating a more efficient and standardized regulatory framework for waste material exports. Additionally, authorities should consider granting permissions for waste material through a more systematic and less time-consuming process. For a more comprehensive and sustainable import policy, incorporating circularity as a central element could contribute significantly to Bangladesh's environmental goals and economic growth in the textile industry.

Figure 22: Specific Regulatory issues in Circularity Transition

Formalizing Waste Management:	• **Informal Waste Networks:** Textile waste management relies on inefficient informal networks. • **Lack of Regulation:** Bangladesh lacks clear waste management standards, fair wages, and accountability. • **Territorial Issues:** Political influence creates convoluted waste routes. • **Quality & Traceability:** Informal waste handling leads to contamination and lack of accountability.
Green Energy Alternatives	• **Incineration Preference:** Manufacturers favor textile waste incineration. • **No Incentives:** Lack of regulations discourages cleaner energy sources. • **Need for Alternatives:** Developing cleaner, affordable energy sources is essential.
Formalizing Waste Management	• **Informal Waste Networks:** Textile waste management relies on inefficient informal networks. • **Lack of Regulation:** Bangladesh lacks clear waste management standards, fair wages, and accountability. • **Territorial Issues:** Political influence creates convoluted waste routes. • **Quality & Traceability:** Informal waste handling leads to contamination and lack of accountability.
Waste Ownership & Traceability	• **Ownership Confusion:** Lack of policies on waste ownership hinders circular collaborations. • **Traceability Absent:** No guidelines for traceability; recycling is inefficient and costly.
Regulatory Hurdles	• **Complex Exports:** Exporting waste materials faces regulatory challenges. • **Missed Opportunities:** The policy lacks explicit support for circularity and recycled textiles. • **Streamlining Needed:** Streamline export processes for waste materials.
Worker Guidelines & EIAs:	• **Missing Worker Guidelines: Lack of guidelines for waste management sector workers.** • **Inconsistent EIAs:** No standardized Environmental Impact Assessments. • **ETP Enforcement:** Inconsistent enforcement of Effluent Treatment Plant (ETP) regulations. • **Import Tariffs:** High import tariffs on recycling machinery hinder circular investment.

4.2.3. Issues in Financing

Access to finance remains a formidable barrier to the transition to circularity and investment in recycling technologies within Bangladesh. The financial landscape in the country presents several challenges, including a preference among financial institutions for short-term financing over long-term loans. Accessing foreign funding sources often involves cumbersome approval processes, leading to significant delays. Moreover, the cost of financing has traditionally been high in Bangladesh compared to neighboring countries, primarily due to the limited depth of the financial system. Bangladesh's financial sector is constrained by the absence of a bond market and the modest size of the stock market, forcing enterprises to rely heavily on banks for financing, despite the inherent tenor mismatch between deposits and long-term investment needs.

Limited financial products and access to green bonds: Many financial institutions in Bangladesh do not offer specialized financial products tailored to the needs of circular economy businesses. These enterprises often require unique financing structures, such as revenue-sharing agreements or performance-based lending, which may not be readily available.

Bangladesh Bank's green financing products are integral to its Sustainable Finance Policy, which ensures that a portion of all bank lending supports environmentally sustainable initiatives. This policy requires each commercial bank to allocate at least 5% of total financing toward green and sustainable projects, with compliance monitored quarterly.[65] Central to this framework is the Green Transformation Fund (GTF), which facilitates financing in multiple currencies (Euro, USD, and BDT) for projects that promote environmental standards, focusing primarily on renewable energy and resource efficiency. Additionally, Bangladesh Bank mandates the Environmental and Social Risk Rating (ESRR) system, which obligates banks to assess and manage environmental risks associated with financed projects, particularly in high-impact sectors like textiles and energy. Although Bangladesh Bank mandates green financing for commercial banks, uptake has been limited, partly due to a shortage of proposals given the high documentation needs and complex requirements.

Complementing these efforts, the Government of Bangladesh established the Bangladesh Climate Change Trust Fund (BCCTF) to address gaps in climate financing from international sources. BCCTF aims to support climate change mitigation and adaptation, and by the 2023-24 fiscal year, a total allocation of Tk. 4,055 crore had been made from both governmental and non-governmental sources. As of December 2023, 961 projects had been approved under BCCTF, with 908 implemented by various ministries and divisions and an additional 61 managed by NGOs under the oversight of the Palli Karma-Sahayak Foundation (PKSF)[66]. However, the extent to which the financed projects follow sustainability guidelines remains unclear, as there is an inherent lack of transparency and accountability.

Bangladesh's first sustainability-linked bond issuance, valued at BDT 1.5 billion, aims to mobilize capital for climate initiatives amid challenging market conditions. The bond, issued by PRAN Agro Limited, encourages corporate participation in sustainability by linking funding costs to various UN Sustainable Development Goals and highlights the importance of private sector involvement in achieving national climate targets[67].

[65]Bangladesh bank Quarterly. Available at: https://www.bb.org.bd/pub/quaterly/greenbanking/qrrsf_apr_jun2023.pdf
[66] Climate Financing for Sustainable Development Budget Report 2024-25. Available at: https://mof.portal.gov.bd/sites/default/files/files/mof.portal.gov.bd/page/b1a52827_25d9_4854_8d82_a6f61921cfc2/Climate_English-Final-%2805-06-2024%29-compressed.pdf
[67] Standard Chartered Bank Limited. Dawn of a new era: The story behind Bangladesh's first green bond.

The collaboration with the financial sector exemplifies innovative financing structures, which can be replicated for recycling and circularity initiatives to provide a sustainable source of financing.

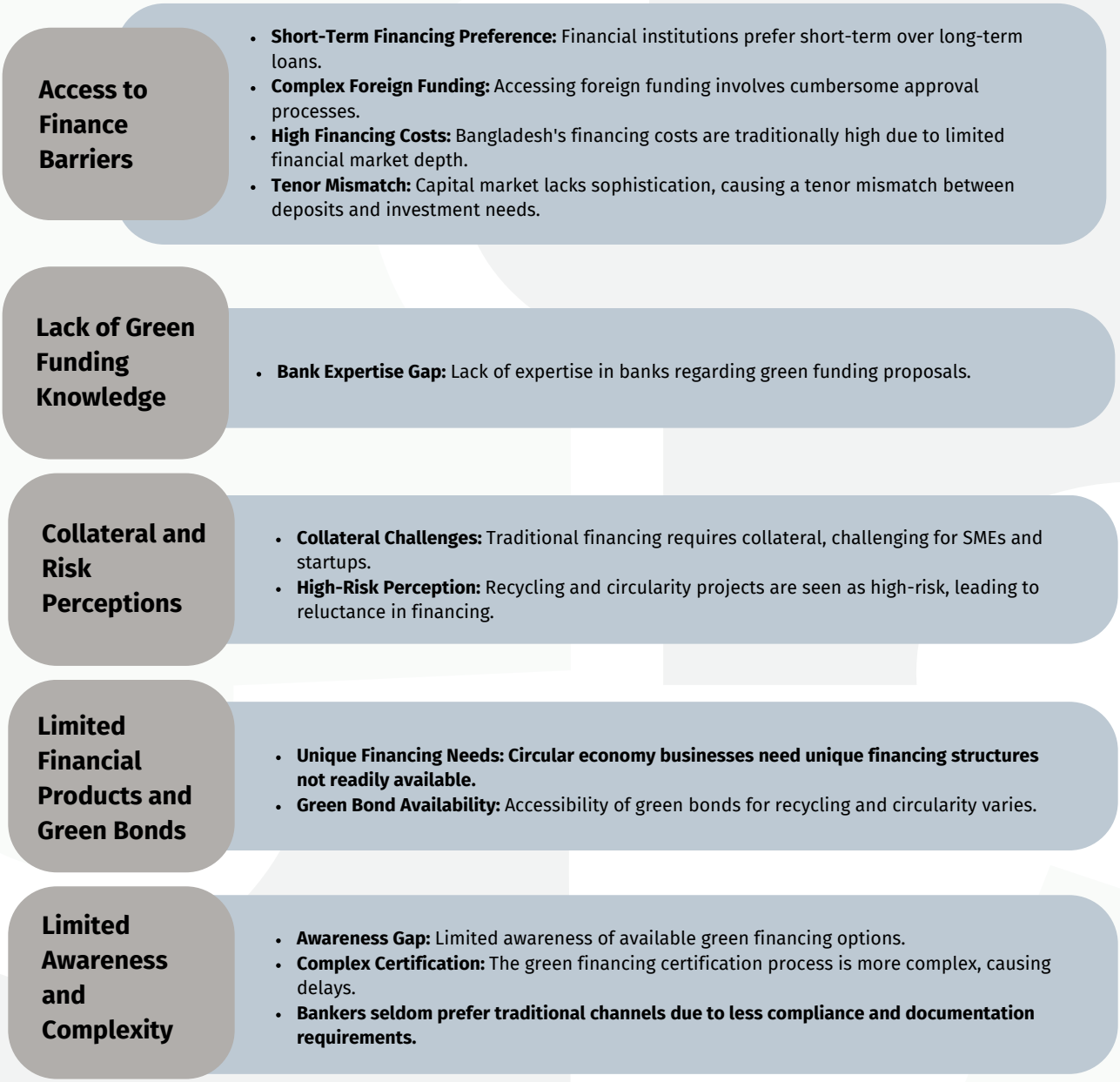
Limited Awareness and Complexity of Green Financing: Despite the availability of various funds like the GTF and low-cost financing options, there is often limited awareness among stakeholders. The process of obtaining certifications for green initiatives is more complex than traditional loans, causing delays in accessing financing and initiating circular projects. While this process has been streamlined, entrepreneurs often lack the sophistication and awareness of various available funds. Bankers may prefer sticking to normal channels due to lower documentation needs, rather than opting for green finance. Although the margin for banks in green channels has been increased to 4%, which should incentivize them, entrepreneurs and borrowers need to actively push for these financing options to successfully avail them. Given that investments are critical to remain competitive in a post-LDC graduation scenario and under pressure from buyers for sustainability, it is necessary for investors to come forward with bankable projects and make use of unutilized funds.

Lack of specialized knowledge within banks on green and circular funding proposals: Despite the availability of finance, the lack of specialized knowledge within banks and the complexities surrounding green finance proposals hinders the adoption of green finance. Many officials lack the expertise to assess green funding proposals comprehensively, while others prefer to push traditional loans due to the complexities and additional due diligence requirements.

Lack of collateral and high risk perceptions: Traditional financing models often require borrowers to provide collateral, which can be challenging for SMEs and startups in the recycling and circularity space. These businesses may not have valuable assets to pledge as collateral, making it difficult for them to secure loans. Recycling and circularity projects, especially innovative ones, are sometimes perceived as high-risk by financial institutions. This perception can result in higher interest rates or a reluctance to finance such projects, discouraging investment in sustainable practices. Furthermore, informal waste collectors and sorters who do not have formal registration will not have access to formal channels of finance.

Addressing these financing challenges necessitates creative solutions and policy changes. The expansion of the Export Development Fund (EDF) and the Green Transformation Fund (GTF) could improve access to finance for circularity initiatives by overall expanding the pool of available finance and linking some of those to recycling initiatives in the textile sector. To make these funds more attractive, operational modalities can be enhanced, eligibility conditions reviewed, and staff trained in circular lending. Collaboration between small green entrepreneurs in coalition schemes may improve their access to green funds. Additionally, further liberalizing capital account transactions and incentivizing banks through sustainability rankings and reduced interest rates could boost investments in environmentally sustainable projects.

Figure 23: Various challenges in Financing



Discussion with Banking Regulation and Policy Department, and other concerned stakeholders will be necessary, as to what other incentives may be considered for banks and financial institutions that deserve to be recognized. It will also be necessary to sit with the concerned agencies such as NBR and Ministry of Environment Forest and Climate Change in collaboration with Bangladesh Bank. It would also be desirable to approach the NBR to make a distinction in terms of import duty structure for projects financed under GTF, and projects under sustainability financing arrangements compared to others. If such incentive structures are established for green investment, financial institutions and investors/borrowers would opt for the products based on the highest incentives.

4.2.4. Unwillingness to Invest due to overall Negative Business Climate

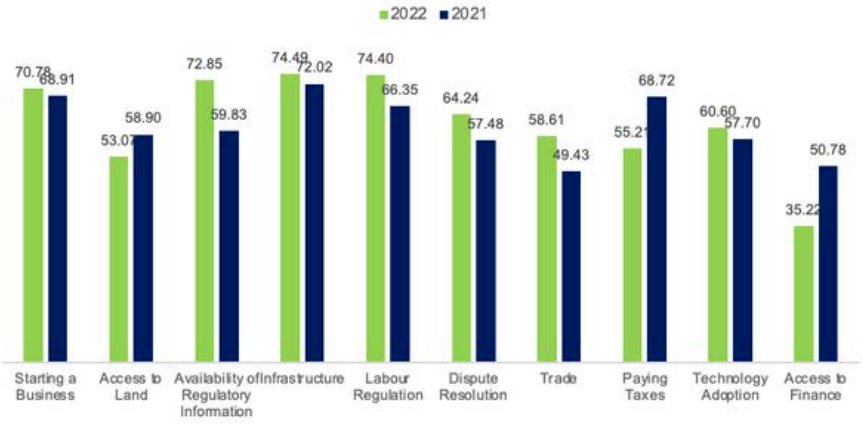
A complex and fragmented regulatory landscape necessitates numerous approvals and clearances, exacerbating costs and timelines for investors.

Regulatory uncertainty dampens investor confidence and trust in the policy landscape. Bangladesh's business landscape is marred by elevated levels of regulatory ambiguity, a factor that significantly dissuades foreign investors from establishing a presence within its borders. In selecting suitable investment destinations, prospective investors meticulously evaluate the lucidity of prevailing policies, the credibility of government authorities, and the degree of adherence to established norms. Unfortunately, Bangladesh frequently falls short of delivering on its commitments, underscoring a deficiency in coordinated efforts due to entangled bureaucratic processes. This prevailing scenario undeniably dampens investor enthusiasm and trust, perpetuating an environment where the perceived risks of engagement outweigh the potential gains. This presents a compelling case for Bangladesh to streamline its administrative mechanisms and policy implementations, fostering an environment of certainty and reliability that can attract foreign investment and promote sustained economic growth.

Inefficiencies stemming from deficient coordination and centralized structures within the governmental apparatus contribute to the compromised attractiveness and competitiveness of the nation's business environment. The regulatory landscape in Bangladesh is intricate, composed of a labyrinthine network of 23 distinct government agencies responsible for catering to investor needs. Aspiring investors are compelled to navigate this intricate landscape, often encountering the requirement to secure up to 150 approvals, registrations, certificates, or clearances from a multitude of entities, such as the Bangladesh Investment Development Authority (BIDA), Registrar of Joint Stock Companies and Firms (RJSC), Bangladesh Bank (BB), and the National Board of Revenue (NBR), among others. This extensive, non-cohesive system results in duplicated requisites, intensifying costs and elongating the timeline for obtaining approvals, consequently impeding the growth of private investment.

According to Bangladesh Business Climate Index (BBX) 2022-23, access to digitally enabled regulatory transparency varies significantly between central and local level regulatory service delivery agencies. A 23.63-point difference between the highest and the lowest performing divisions in access to regulatory information implies that there is a huge disparity in the availability of regulatory information across divisions. This not only reflects a gap in access to the Internet across divisions but a disparity in the availability of information regarding rules and regulations by the local government such as municipal corporations.

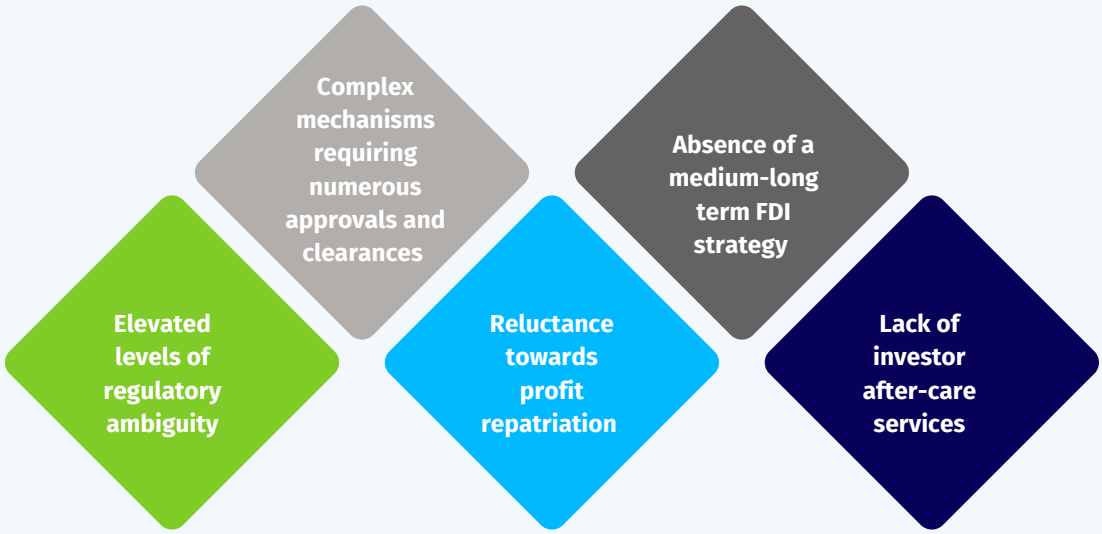
Figure 24: Comparison of BBX Pillar Scores between 2022 and 2021



The strength of robust laws and regulations is severely compromised due to non-systematic and non-inclusive changes in the regulatory framework creating regulatory unpredictability. About 71 percent of respondents mentioned that the government often changed or modified regulations that affected their businesses. Several elements lead to high-level constraints for the proliferation of private sector investment and significantly hinder business dynamism in Bangladesh. This is characterized by over-regulation, weakness in regulatory service delivery, and challenges in transparency and accountability which are detrimental to the regulatory environment and make the process more costly both in terms of time and money.

Restriction and the conservative mindset of the bureaucracy against profit repatriation deter FDI inflow. *Bangladesh Bank frequently introduces obstacles to profit repatriation, a vital requirement for FDI, thereby impeding FDI inflow. Foreign investors encounter challenges in retrieving earnings and dividends. In contrast, neighboring countries like India, Vietnam, and Indonesia have streamlined investment regulations to attract FDI. Bangladesh should consider adopting a comparable strategy to enhance its investment allure.*

Figure 25: Issues in the regulatory framework that dampens Investor Confidence



Inefficiencies in Bangladesh's trade logistics and infrastructure, such as inadequate transport networks, congested ports, and cumbersome customs processes, hinder both competitiveness and circular economy efforts. It raises operational costs and deter potential investors.

Inefficiencies in logistics infrastructure hamper trade facilitation efforts and in turn, investments. The availability of transport logistics services is often neutralized by the high cost and efficiency of such support factors. A World Bank report suggests that logistics costs comprise between 4.5 to 47.9 % of total sales. As the economy slowly expands to facilitate more business sectors, the current transport services are not well suited for sectors in need of specialized logistics systems. The BBX[68] reports that firms from the construction sector found it challenging to find transportation as the sector requires a special set of transport services/vehicles to carry their raw materials and products which are heavy-weighted.

[68] Policy Exchange 2024. Bangladesh Business Climate Index 2023-24

The textile sector, particularly with reverse logistics — a critical element of circularity — faces challenges due to high logistics costs and inefficiencies. Reverse logistics plays a crucial role in transitioning to circularity by facilitating the return of products from consumers to a consolidation point for refurbishing, reusing, or recycling[69]. However, it requires specialized infrastructure for collection, sorting, and redistribution. Bangladesh's outdated infrastructure, lack of specialized transport for reverse logistics, and inadequate recycling facilities create significant barriers. For example, the current transport services, which are already insufficient for sectors needing specialized systems, are not suited for the textile industry's requirements for reverse logistics. Without improvements in logistics, including better road networks, optimized port functions, and seamless intermodal transport systems, both forward and reverse logistics are hindered. This affects not only the recycling industry but also the textile sector's competitiveness.

The costs of managing the entire reverse logistics process — such as transporting textile waste from factories to recycling centers — are also high, compounded by inefficiencies in the transport systems and inadequate waste processing infrastructure. Such challenges slow down efforts toward a circular economy, where the value of post-consumer textiles could otherwise be maximized through effective collection, sorting, and reintegration into the supply chain. Consequently, addressing these logistics shortcomings is essential for fostering sustainability in Bangladesh's textile industry.

Addressing low productivity is another pivotal concern. A skilled and technologically adept workforce is an essential asset for prospective investors, and Bangladesh must invest in these areas to remain competitive on the global stage.

In the context of Bangladesh's unique demographic composition and economic context, labor productivity and skill development emerge as pivotal components in shaping the country's developmental trajectory. The World Bank's publications and the Bangladesh Government's Vision 2041 document underscore the necessity for Bangladesh to capitalize on its demographic dividend – a burgeoning youth population that holds immense potential for economic growth. With its population of 170 million, a majority of whom are youth, Bangladesh's potential strength lies in its human capital. The influx of approximately 2.5 million new entrants into the workforce annually for the next 15 years provides a significant opportunity for growth. The country's historical growth has been propelled by the integration of workers into the labor force and the accumulation of capital. To fully exploit this demographic advantage, it is imperative for Bangladesh to strategically invest in human capital, elevate productivity, and create an enabling economic environment that generates quality employment opportunities

Addressing the multifaceted challenges of labor productivity and skill development demands robust investments in human development infrastructure. The education sector, while witnessing rising enrollment figures, grapples with quality issues. Similarly, access to healthcare remains inadequate, with 80 million people lacking sufficient coverage. This disconnect between demographic potential and development infrastructure is mirrored in cumulative public expenditure on education and healthcare, which stands at 2.5 % of GDP – significantly lower than the 10 % benchmark in upper-middle-income countries. Both Vision 2041 and the World Bank reports accentuate the urgency of bridging these gaps, emphasizing that investing in quality education, healthcare, and skill development is essential for harnessing the full potential of Bangladesh's demographic dividend and transitioning to a knowledge-based, inclusive economy.

[69] https://www.renewablematter.eu/en/reverse-logistics-the-circular-economy-weakest-link

4.2.5. Other Challenges

Inconsistent Enforcement of Effluent Treatment Plant (ETP) Regulations: Effluent Treatment Plants are critical for treating and managing industrial wastewater in the textile and RMG sector. However, the enforcement of ETP regulations is often inconsistent. Some factories may not adhere to ETP requirements, leading to the discharge of untreated or inadequately treated wastewater into the environment. Strengthening regulatory oversight and enforcement mechanisms for ETPs is essential to prevent environmental pollution and ensure that factories comply with wastewater treatment standards.

Adopting Traceability Tools to Present Waste Value and Flows: Recyclers receiving textile waste from informal waste networks lack access to background information about the sourced material. There are no quality control measures among informal traders, and there are no policies or regulations promoting traceability. The absence of traceability tools makes it easy to manipulate the quality of sourced textile waste, adding extra costs for recyclers who must test each batch for suitability. Traceability is crucial for recyclers to gather valuable data about feedstock and ensure circularity. Without policies encouraging traceability, the recycling process remains inefficient and costly.

Harnessing the Potential of Export Processing Zones in Bangladesh: While Export Processing Zones (EPZs) in Bangladesh regulate waste management, there are no clear regulations regarding transparency and traceability of waste flows once they leave these zones. Value-added-tax (VAT) implications for waste handling and movement are not assessed. The lack of visibility into waste flows outside EPZs hinders transparency and traceability. To foster industrialization within EPZs and encourage recycling, technology platforms should be utilized. Additionally, assessing VAT implications for waste handling is essential to ensure a conducive environment for circular practices.

5. Key areas for policy action

Bangladesh stands at a pivotal juncture where embracing a circular economy model within the textile and apparel industry can lead to transformative change. The government, industry, academia, and civil society must unite in this endeavor. Collaboration is the cornerstone of success, and public-private partnerships are instrumental in creating an enabling environment for circular initiatives. This journey requires a clear roadmap.

A holistic approach to advancing the circular economy in Bangladesh's textile and apparel industry involves several key factors. Firstly, government policies should be meticulously aligned with circular economy principles, effectively incentivizing sustainable practices and innovation. Concurrently, comprehensive educational programs and awareness campaigns should be launched, fostering a culture of sustainability and promoting active participation in circularity efforts. To equip stakeholders with the necessary skills and knowledge, specialized training programs should be instituted to navigate green financing and green certification processes adeptly. Encouraging research and development in circular textile processes and technologies is pivotal, as it propels innovation and bolsters competitiveness. Regulatory clarity is of utmost importance; thus, promoting transparency and comprehensibility in waste management regulations nurtures trust and accountability within the industry. To ensure the efficacy of circular practices, strict enforcement of environmental standards and waste processing regulations is essential. Lastly, positioning Bangladesh as a leader in circularity on the global stage is paramount, emphasizing its potential for self-sufficiency and sustainability in international markets.

1. Develop a National Circular Economy Strategy/Policy for Textiles:

Create a centralized framework outlining a roadmap for circularity in the textile sector, integrating clear targets, milestones, and sector-specific approaches alongside other industries like plastics and construction. The strategy should harmonize existing environmental policies, streamline regulations, and ensure alignment among ministries for effective implementation. Clear incentives, including tax benefits, should be established to motivate businesses to adopt circular principles while promoting innovation in resource efficiency. This comprehensive approach will facilitate a smoother transition to a sustainable, circular economy in Bangladesh's textile industry. The strategy should be developed in consultation with the stakeholders and bring in relevant ministries, with one of the ministries leading coordination efforts and implementation.

2. Formalize the Informal Waste Sector through incentives, training and clear regulations:

Establish regulations and incentivize informal waste collectors to integrate into formal systems. This should include providing lucrative and affordable financing options as well as training programs to enhance their capacity to comply existing and future guidelines. Clear regulations should be put in place such as adhering to safety standards and ensuring fair wages, while also maintaining adequate hygiene and following proper sorting procedures. Capacity building programs should also aim to enhance their operational effectiveness, while ensuring traceability and accountability in waste flows, which will ultimately improve overall recycling efficiency and reduce contamination.

3. Clear Waste Ownership and Recycling Guidelines:

Establish explicit legal frameworks that define ownership of waste materials, criteria for their reuse, and recycling standards. The ambiguity around waste ownership in Bangladesh's textile and RMG sector has significant implications for accountability, investment in waste management, and the advancement of circular practices. Without clear ownership designation, the allocation of responsibilities remains fragmented, with brands and manufacturers each deferring liability. This lack of clarity hinders effective waste management policies, slows investment in recycling infrastructure, and complicates compliance with sustainability standards. Establishing a definitive ownership framework would promote shared accountability, streamline regulations, and encourage investment in sustainable waste solutions. This should include provisions for ensuring transparent transactions, legal documentation, and value sharing among stakeholders. Such regulations will facilitate market clarity, reduce disputes, and enhance the economic value derived from waste materials. Clear ownership rules can also enable better waste tracking, improve labor conditions in waste management, and foster partnerships to drive circularity across the sector.

4. Comprehensive Environmental Fiscal Reform to incentivize recycling:

- **Integrated Tax System Overhaul:** Implement a holistic redesign of the tax system that incorporates environmental costs into pricing structures. This should include a robust carbon pricing mechanism, resource taxes, and the removal of subsidies for environmentally harmful activities. For example, luxury taxes on high-impact goods (such as SUVs and fast fashion) could be introduced to discourage excessive consumption while generating revenue that can be redirected to fund sustainable initiatives. This revenue can be used to provide subsidies for low-impact activities, enhancing the attractiveness of green investments for the private sector and creating a clear economic incentive for businesses to transition towards circular practices.
- **Remove disincentives to Textile waste recycling:** Amend VAT and customs policies to reduce the financial burden on recycling industries, particularly textile and apparel recycling.
- **Provide further incentives to boost recycling of wastes:** Introduce financial mechanisms such as tax rebates, subsidies, or low-interest loans for businesses implementing recycling technologies and cleaner production methods. These incentives will promote sustainability and reduce reliance on imported raw materials, fostering the growth of circular industries.
- **Lower duty structures for Green Machineries:** It will be important for NBR to distinguish import duty structure for green projects and facilitate lower duties, to promote investments in sustainable areas such as textile recycling. Developing unique HS Codes for machineries that are eco-friendly and essential for recycling projects and broader sustainability purposes will help easily distinguish and enable lower duty structures, further incentivizing capital investments and streamlining import procedures.

- **Dynamic Adjustment Mechanisms:** Establish adaptive fiscal policies that allow for periodic reassessment of environmental taxes and subsidies based on market response and environmental outcomes. This would ensure that the economic incentives remain relevant and effective, encouraging continual investment in sustainable practices while also addressing inequalities by ensuring that proceeds from taxation are reinvested in communities disproportionately affected by environmental degradation

5. Strengthen Regulatory Enforcement for Circular Economy:

- **Standardized Environmental Impact Assessments (EIA):** Work with the Ministry of Environment to develop standardized EIAs for all industries, ensuring that they include specific criteria related to circular economy principles. This could encourage more uniform compliance with environmental regulations.
- **Enhanced Effluent Treatment Plant (ETP) Compliance:** Strengthen monitoring and enforcement of ETP regulations to ensure all factories treat wastewater according to standards. Introduce fines for non-compliance and financial incentives for firms adhering to best practices in wastewater management.
- **Implement Extended Producer Responsibility (EPR):** Mandate that manufacturers bear the responsibility for their products' entire lifecycle — from production to post-consumer disposal. This will ensure that businesses are accountable for recycling, reusing, or properly disposing of their products, promoting eco-friendly designs, and closing the loop in material use.
- **Legal waste management framework:** Establishing a waste management framework would enable firms to routinely keep track of how much waste they are generating. Such a common framework will improve data on the industry level, while also helping keep track of how the waste is being managed. This would greatly enhance transparency within the sector in terms of how much waste is generated and also help firms enhance their resource efficiency.

6. Improve Business Climate for Circular Investments:

- **Simplify Trade Regulations for Waste Materials:** Streamline regulatory procedures for the import and export of waste materials used in recycling. Simplified approval processes, alongside reduced customs duties on recycled goods, will encourage cross-border trade in waste materials, promoting circularity. This will also align Bangladesh with international standards and global sustainability efforts.
- **Streamline Regulatory Processes for clearances & permits:** Simplify the bureaucratic processes by establishing a one-stop digital platform that coordinates approvals for green and circular projects. Consolidate regulatory approvals across agencies (BIDA, BB, NBR) to shorten timelines for foreign direct investment and environmental clearance.
- **Transparent Regulatory Framework:** Reduce regulatory uncertainty by implementing clear, long-term policy guidelines on sustainability. Introduce consistent timelines for reviewing and revising environmental regulations, ensuring businesses have confidence in long-term investments.

7. Address Logistics and Infrastructure Gaps:

- **Strengthen Waste Management Infrastructure:** Invest in modern recycling facilities and secure landfill systems, particularly for hazardous waste. This should involve developing waste segregation practices at the source, bolstering municipal solid waste collection, and building designated areas for hazardous waste treatment. Incentivizing private-sector investment in advanced recycling technologies and waste-to-energy initiatives will be critical in achieving efficient waste management practices.
- **Create Green Energy Alternatives:** Support the transition from waste incineration to cleaner energy solutions by promoting the use of renewable energy in industrial processes. Provide financial incentives for industries adopting alternatives such as biomass, solar, or wind energy, and gradually introduce policies to phase out incineration. Tax breaks or subsidies can be offered for energy-efficient technologies, while long-term plans may include taxation or outright bans on incineration of recyclable waste.
- **Invest in Reverse Logistics Infrastructure:** To enhance textile circularity in Bangladesh, it is essential to invest in reverse logistics infrastructure. This involves designing products for easy recycling, and using reusable packaging that provides clear recycling information. Additionally, adopting alternative transport modes and leveraging digital technologies for tracking will streamline reverse logistics operations, ultimately promoting sustainability in the textile sector.

8. Partnership Frameworks for Circular Economy Initiatives:

- **Innovative Financing Models:** Develop a framework for public-private partnerships that encourages investment in circular economy projects through shared financial risks and rewards. This can include mechanisms such as blended finance, where public funds are used to de-risk private investment in circular initiatives. By leveraging public funds to guarantee returns or minimize risks, more private capital can be attracted to projects that promote sustainability, such as recycling facilities or renewable energy ventures.
- **Collaborative Innovation Hubs:** Establish innovation hubs that bring together government agencies, businesses, and educational institutions to foster collaboration on circular economy initiatives. These hubs would serve as incubators for new business models that align with circular principles, providing access to technical expertise, funding opportunities, and networks. The collaboration would also enable knowledge sharing and best practices, ultimately leading to more effective project implementation and scaling of successful initiatives.

9. Targeted Green Financial Instruments and Risk Mitigation:

To stimulate investment in the circular economy, the establishment of government-backed green bonds and a circularity fund can be helpful for long-term financing of recycling and sustainable projects. A public-private partnership risk-sharing mechanism can also help mitigate perceived investment risks by combining public and private capital to lower borrowing costs. Collaboration between small green entrepreneurs in coalition schemes may improve their access to green funds.

The size of the Export Development Fund, Green Transformation Fund and Climate Change Trust Fund can be further expanded to help transition to sustainable industrial practices. To make these funds more attractive, operational modalities can be enhanced and eligibility conditions reviewed. It would also be desirable to approach the NBR to make a distinction in terms of import duty structure for projects financed under GTF, and projects under sustainability financing arrangements compared to others. If such incentive structures are established for green investment, financial institutions and investors/borrowers would opt for the products based on the highest incentives.

It is imperative to bridge the knowledge gap among stakeholders and develop mechanisms for the efficient allocation of available funds. While these financing issues remain, it's imperative to bridge the knowledge gap among stakeholders and develop mechanisms for the efficient allocation of available funds. Proper training and technical assistance are essential to overcome capacity limitations. Additionally, incentives such as import duty distinctions for green investments could encourage financial institutions and borrowers to prioritize sustainability initiatives. Overall, addressing these financing-related hurdles is crucial to promote circularity and sustainable development in Bangladesh's industrial sectors.

10. Encourage Foreign Direct Investment (FDI) in Circular Economy

- **Profit Repatriation and Investment Reforms:** Reform profit repatriation rules to make Bangladesh more attractive for foreign investors. Implement clear policies for the repatriation of profits and dividends, and consider offering tax breaks or incentives for FDI in circular economy initiatives.
- **Investment aftercare:** Investor aftercare, a critical element in retaining and expanding existing FDI, always fell down the pecking order due to insufficient institutional capacity and a lack of strategic focus on holistically improving all elements of the investment climate. To develop a competitive investment climate, it will be important to prioritize nurturing and providing proactive support to existing investors.
- **Establish a predictable, transparent and efficient taxation system** that is competitive internationally and aligned with global principles, so that investors feel comfortable investing and do not face hurdles when complying and claiming benefits.

11. Comprehensive Awareness and Capacity-Building Programs:

Implement a nationwide green awareness campaign to educate businesses and financial institutions on the economic and environmental benefits of circular economy practices, featuring success stories from various sectors. Alongside this, provide technical assistance and capacity-building programs for SMEs and startups, offering workshops on project proposals, green certifications, and access to financing. Strengthen knowledge within financial institutions through national training programs for bankers and establish sustainability expertise hubs. Streamline access to funds like the Export Development Funds (EDF) and Green Transformation Funds (GTF) while liberalizing regulations for foreign capital to support circular economy initiatives.

12. Promote Consumer Awareness and Behavior Change:

Launch nationwide education campaigns targeting consumers, highlighting the benefits of circularity and sustainable consumption. Encourage the use of recycled, upcycled, and eco-friendly products through awareness programs, labeling schemes, and incentives for sustainable purchasing behavior. Such campaigns will drive demand for circular products, creating a market shift towards more responsible consumption.

Table 2: Summary of Recommendations

Recommendation	Description	Responsible Stakeholders	Timeline
1. Develop a National Circular Economy Strategy for Textiles	Create a centralized framework outlining a roadmap for circularity in textiles, integrating clear targets and incentives. The strategy should align with existing environmental policies indicating clear guidelines on roles and responsibilities of different stakeholders.	Ministry of Commerce (MoC), Ministry of Textiles and Jute, Ministry of Forest, Environment & Climate Change (MoEFCC), NBR, Ministry of Industries	Short Term
	Harmonize regulatory efforts among relevant ministries to streamline circularity initiatives and promote innovation in resource efficiency.	MoC, MoEFCC, Ministry of Industries, NBR	Medium Term

2. Formalize the Informal Waste Sector	Provide incentives such as affordable financing and trainings to help transition informal waste collectors into formal systems, ensuring they meet hygiene and safety standards.	Ministry of Labor and Employment, Ministry of Industries	Medium Term
	Implement clear regulations, including fair wages and sorting protocols, to enhance capacity and traceability in waste management, reducing contamination and improving recycling efficiency.	Ministry of Labor and Employment, Ministry of Industries	Medium Term
3. Clear Waste Ownership and Recycling Guidelines	Establish legal frameworks to define waste ownership, use criteria, and recycling standards, resolving ambiguity over accountability for waste management and recycling investments.	Ministry of Law, MoEFCC, MoC	Short Term
	Enforce ownership guidelines with transparent transactions, legal documentation, and value-sharing practices to enable market clarity, efficient waste tracking, and improved labor conditions in the waste sector.	MoEFCC, Ministry of Law, Ministry of Commerce	Medium Term
4. Comprehensive Environmental Fiscal Reform	Overhaul the tax system to integrate environmental costs, encourage recycling, and adjust environmental taxes based on evolving market and environmental responses.	Ministry of Finance, National Board of Revenue (NBR)	Long Term
	Remove VAT and customs policy barriers to textile recycling, and introduce incentives like tax rebates for adopting cleaner technologies.	NBR, Ministry of Finance	Short Term

	Introduce lower duties for eco-friendly machinery by developing specific HS Codes, thus encouraging investment in green projects.	NBR, Ministry of Commerce	Medium Term
5. Strengthen Regulatory Enforcement for Circular Economy	Update Environmental Impact Assessments (EIAs) to cover circular economy criteria across industries, ensuring compliance with environmental regulations.	Department of Environment, Ministry of Industries, MoC	Medium Term
	Implement and enforce Extended Producer Responsibility (EPR), mandating manufacturers' responsibility for the entire product lifecycle.	Department of Environment, Ministry of Industries	Long Term
	Establish a waste management framework for industry-level tracking of waste generation and management, enhancing resource efficiency and transparency.	Department of Environment, Ministry of Commerce	Short Term
6. Improve Business Climate for Circular Investments	Simplify trade regulations for importing/exporting recycled materials to promote cross-border circular economy trade in line with global standards.	Bangladesh Investment Development Authority (BIDA), NBR, MoC	Short Term
	Streamline Regulatory Processes for clearances & permits for green projects by creating a digital platform consolidating processes across agencies like BIDA, BB, and NBR.	BIDA, NBR, MoC	Medium Term
	Establish a predictable, transparent and efficient taxation system that is competitive internationally and aligned with global principles.	NBR, Ministry of FInance	Medium Term

7. Address Logistics and Infrastructure Gaps	Invest in recycling infrastructure, including modern facilities and landfill systems, to manage hazardous waste effectively and incentivize private-sector investment in advanced waste solutions.	Ministry of Local Government, Ministry of Energy	Medium Term
	Develop renewable energy alternatives and tax incentives for energy-efficient technologies to phase out incineration.	SREDA, Power Division, MoEFCC	Medium Term
	Enhance reverse logistics by investing in reusable packaging and tracking technologies, optimizing circularity in the textile sector.	Ministry of Planning, PPPA, Ministry of Commerce	Medium Term
8. Partnership Frameworks for Circular Economy Initiatives	Establish innovative financing models like blended finance to de-risk circular investments and promote sustainable ventures such as recycling and renewable energy projects.	Ministry of Planning, PPPA, Ministry of Commerce	Medium Term
	Set up collaborative innovation hubs linking government, businesses, and academia to support knowledge-sharing and new business models in circularity.	Ministry of Commerce, PPPA, Universities	Long Term
9. Targeted Green Financial Instruments	Further develop green bonds and local capital market, boost EDF/GTF and incentivize banks to push green financing.	Bangladesh Bank, Ministry of Finance, PPPA	Medium Term
	Simplify access to EDF and GTF and incentivize banks to prioritize green financing through simplified criteria and capacity building.	Bangladesh Bank, NBR	Medium Term

10. Encourage Foreign Direct Investment (FDI)	Improve investment climate to attract FDI in circular economy and ensure transparent and, predictable regulations.	Ministry of Finance, BIDA, NBR, Ministry of Foreign Affairs	Short term
	Strengthen investment aftercare by improving support for existing investors, fostering a business-friendly environment to retain FDI.	BIDA, Ministry of Commerce	Medium Term
11. Comprehensive Awareness and Capacity-Building Programs	Launch campaigns to educate businesses and financial institutions on the benefits of circularity, and provide SMEs with training on green certifications and project financing.	Ministry of Information, Ministry of Commerce	Short term
12. Promote Consumer Awareness and Behavior Change	Implement nationwide campaigns promoting circular products and sustainable consumption through labeling schemes and incentives, creating market demand for eco-friendly products.	Ministry of Information, MoEFCC	Long Term