

Smooth Transition of Bangladesh's RMG Sector: Post-LDC Graduation with Circular Economy Principles

Farjana Yasmin^{1*}

¹Climate Change and Environment Specialist, Ethical Trading Initiative (ETI) Bangladesh

*Corresponding Author

Keywords: RMG, Circular economy, LDC, MIC, International trade, MMF, Sustainability

Abstract

Bangladesh is towards to Developing Country from Least Developed Country (LDC) in November 2026. This upgradation refers that country meets economic vulnerability, per capita income and human resources. Significant economic development is indicated by this, but there are drawbacks to the shift as well, especially in terms of trade gains and the requirement for strategic planning. As Bangladesh's economy heavily depends on the ready-made garment (RMG) sector, this sector will have to contend with issues like declining trade preferences. This paper explores the potential way forward for RMG sector to cope up with post LDC graduation by Circular economy principles. At the same time, this paper aims to enhance the environmental sustainability by circular approach. After LDC graduation, maintaining export growth requires fostering domestic value addition, and fortifying backward linkage. The paper explains number of policy recommendation to support a circular, resilient RMG sector in the competitive global market.

1. Introduction

The ready-made garment (RMG) industry, which accounts for a sizable amount of Bangladesh's export revenue and it is also vital to the nation's economy, contributing 7.87% of the GDP in 2024 (Bangladesh Bank). The sector boasts a multifaceted structure encompassing cotton, synthetic textiles, ready-made garments (RMGs), and home textiles. In 2024, the industry's value reached an estimated \$38.48 billion and rising domestic and international demand for Bangladeshi RMG. For the past ten years, Bangladesh's garment industry has remained one of the top exporters in the world. Favorable international trade facilities, a large labor pool, and supportive national policies are the main drivers of this success story. Right now, as trade preferential scheme Bangladesh enjoying LDC criteria. Therefore, Bangladesh met certain criteria to graduate like Gross National Income (GNI), Human Assets Index (HAI) and the Economic Vulnerability Index (EVI) (Chaity et al., 2025). A nation's credit ratings and reputation are improved by graduation, and investors' perceptions in the public and private sectors are also improved (Sarker et al., 2020).

Currently, the traditional reliance on virgin materials in textile production comes to a concern for upcoming LDC graduation due to great loss of export opportunities. Leads to increasing large amount of manufacturing cost including export cost. Resulting Bangladesh will be more vulnerable to carry out its export competitiveness in the world at the same time possibility to potential buyer lose. Graduation is an irreversible track for Bangladesh (Sarker & Rahman, 2019). Bangladesh requires strong international support in terms of stirring necessary knowledge, technologies, and capacities (Sarker et al., 2020). Therefore, need domestic value addition by boosting the national backward linkage sector and at the same time reducing reliance on cotton using. For the smooth transition from Least Developed Country (LDC) to Middle Income Country (MIC), Bangladesh government should take necessary measures to cope with the changing economic scenario and some of them have been recommended. (Rahman et al., 2020) Implementing circular economy principles could be potential way by reducing MMF import and value addition of plastic. On the other hand, Bangladesh's plastic management could significantly mitigate the environmental threat posed by plastic pollution. Therefore, the most common understanding of the circular economy is one which designs out waste and pollution, keeps products and materials in use for as long as possible, and regenerates natural systems (Barrie & Schroder, 2021).

2. Literature review and Research gap

However, there are very few research studies on the concept of Circular economy (CE) in the context of poor nations, particularly Bangladesh (Kirchherr and van Santen, 2019). On the other hand, Kirchherr and van Santen (2019) emphasized the study of CE, especially for emerging and developing countries, as there are very few articles (only 5%) that focus on the concept of CE. Schroder et al. (2019) stated that, some of the SDG targets, including SDG-6 (Clean Water & Sanitization), SDG-7 (Affordable Clean Energy), SDG-12 (Reasonable Consumption & Production), and SDG-15 (Life on Land), can be linked to the circular economy approach. After careful review of relevant literature this paper provides a strategy for product design and business model innovation for a circular economy.

Therefore, cost-effective sophisticated technologies are required to smoothen the transition (Khan & Ali, 2021; Serrano et al., 2021; Winterstetter et al., 2021). The developing countries, most of them lack and efficient structured approach to address climate objectives to their policy

decisions and overall development approaches (Serrano et al., 2021). Ahmed et al. (2022) shows that, In India the practice of CE though, making of paper out of elephant dung; collection of E-waste; collection of organic wastes, and turning them into compost fertilizer; bus service running on renewable biogas. In real scenario developing country like Bangladesh shifting circular economy is quite challenging due to lack of proper technological capability. A multifaceted, inclusive, and cooperative approach from stakeholders is required to address the difficulties of implementing CE practices. (Gunarathne et al., 2019; Mishra et al., 2019; Radelyuk et al., 2021).

3. Circular economy context

Circular Economy (CE) was probably first defined and conceptualized in the Ellen MacArthur Foundations report, as “an industrial system that is restorative or regenerative by intention and design”. This means pursuing and creating the opportunities for a shift from an “end-of-life” concept to Cradle-to-Cradle, from using unrenewable energy towards using renewable, from using toxic chemicals to their elimination, from much waste to eliminating waste through the superior design of materials, products, systems, and also business models. (Lewandowski, 2016).

Secondly, Scott provided a useful conceptualization of circular economy as “a concept used to describe a zero-waste industrial economy that profits from two types of material inputs: biological materials are those that can be reintroduced back into the biosphere in a restorative manner without harm or waste (i.e: they breakdown naturally); and, technical materials, which can be continuously re-used without harm or waste” (Lewandowski, 2016).

The European Commission prioritized the circular economy in its economic approach by introducing the Circular Economy Action Plan (CEAP) and subsequently updating it with CEAP 2.0. The European Parliament is advocating for further "science-based binding EU targets for the mid-term and long-term reduction of primary raw material usage and environmental effects". A number of multilateral partnerships, including the African Circular Economy Alliance, the Platform for Accelerating the Circular Economy (PACE), and the Global Alliance for Resource Efficiency and Circular Economy (GARECE), have been formed in recent years to hasten the shift to a circular economy on a regional and global level. Adopting a circular economy is seen at the national level as a way to improve economic competitiveness and reduce the risks brought on by erratic global supply networks. By 2030, for example, the Dutch government wants to reduce its resource use by 50%, and more than 33 national circular economy roadmaps have been unveiled throughout Europe. (Barrie & Schroder, 2021).

4. Aims of circular textiles economy

A circular economy is one in which natural systems are restored, waste is eliminated, and everything is utilized to its fullest potential for as long as feasible. The idea of circularity is very similar to nature, which has no waste because all materials are valuable and used in a variety of ways to support life. If we effectively deploy these strategies, we will require fewer materials to meet similar societal needs (Bocken et al., 2016).

The four strategies we can use to achieve these objectives, and in particular in the context of textiles, are:

4.1. Regenerate flows-Make clean

Regenerate ecosystems and safeguard health by using renewable resources (fibers, water and energy) from sustainably-managed environments, eliminating substances of concern in the production of textiles; addressing microfiber release from synthetic textiles and eliminating textile pollution and waste.

4.2. Narrow flows-Use less

Narrowing resource flows, aimed at using fewer resources per product. Narrowing loops is about reducing resource use associated with the product and production process. Reduce the size of the problem by reversing the overproduction and overconsumption of textiles and reducing demand for resources through resource efficiency in the production process.

4.3. Slow flows-Use longer

Slowing resource flows, through the design of long-life goods and product-life extension (i.e. service loops to extend a product's life, for instance through repair, remanufacturing), the utilization period of products is extended and/or intensified, resulting in a slowdown of the flow of resources. Furthermore, "slowing" is about prolonged use and reuse of goods over time, through design of long-life goods and product life extension. Make textiles last by designing products for longevity and durability, repairability and recyclability; by investing in new circular models for reuse and repair; and by engaging citizens to extend the lifetime of their textile products through, e.g., better care, maintenance and repair.

4.3.1 Design strategies to slow flows

4.3.1 (a) Designing long-life products

- Design for attachment and trust
- Design for reliability and durability

4.3.1 (b) Design for product-life extension

- Design for ease of maintenance and repair
- Design for upgradability and adaptability
- Design for standardization and compatibility
- Design for dis- and reassembly

4.4. Close flows-Use again

Closing resource flows, through recycling, the loop between post-use and production is closed, resulting in a circular flow of resources. These two approaches are distinct from a third approach toward reducing resource flows. In addition, closing loops is about reuse of materials through recycling. Bring textiles back into the loop by dealing with the legacy of the existing textile waste mountain and boosting textile recycling and markets for recycled fibers. (Bocken et al., 2016).

4.5. Design strategies to close loops

- Design for a technological cycle
- Design for a biological cycle
- Design for dis- and reassembly

Note: Design for dis- and reassembly fit both strategies for closing and slowing loops.

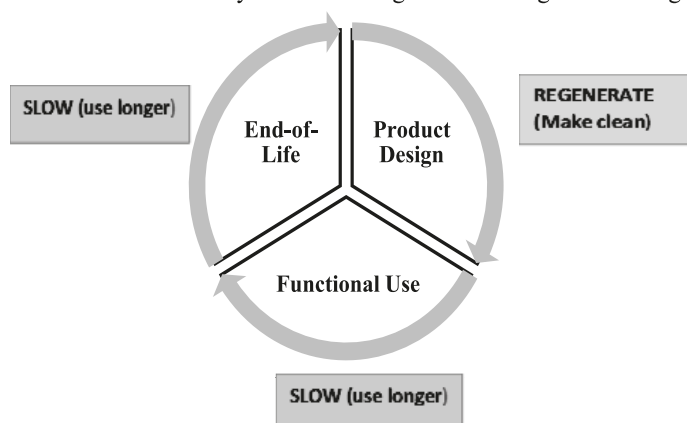


Figure-1: Circular textile Economy

5. Upcoming challenges associated with LDC graduation

Upgradation of country status enhance economic stability as like draw more foreign investment and development. However, Bangladesh is not fully prepared to become Developing Country in terms of post LDC criteria. Furthermore, as Developing Country to qualify for GSP Plus in the EU (the proposed import ceiling for the single market will need to be increased), and to secure enhanced preferences in the UK (the new rules of origin will necessitate double transformation in both spinning and weaving), it will be essential to significantly reinforce the backward and forward linkages within the apparel industry. (Rahman, 2024). Below the table shows the EU GSP arrangement and provisions as per eligibility criteria-

Table 1: EU GSP arrangement and provisions

Preference scheme	Eligibility criteria	Non-sensitive goods	Sensitive goods	Rules of origin (important provisions only)
Standard GSP	Low or lower-middle income countries	Duty reduction for around 66% of all EU tariff lines.	Duty reduction: 30%-up to 3.5 percentage points	Double transformation for textile and clothing items. For all other products, a minimum local value added of 50%

Preference scheme	Eligibility criteria	Non-sensitive goods	Sensitive goods	Rules of origin (important provisions only)
GSP+	Vulnerable (for export diversification, export and import volumes) Standard GSP beneficiaries that have ratified the 27 GSP+ relevant international convention	Duty suspension for around 66% of all EU tariff lines, including textile and clothing items.	Duty suspension	Double transformation for textile and clothing items. For all other products, a minimum local value added of 50%
EBA	LDCs	Duty suspension for all goods except for arms and ammunition.	Duty suspension	Single transformation for textile and clothing items. For all other products, a minimum local value added of 30%

Source: European Commission website (2022)

Above table explains that- after LDC graduation as per rules of origin we must comply double transformation for textile and clothing items. For all other products, a minimum local value added of 50%. So, it is clear we need to strengthening backward linkages industries. In this transition Man Made Fiber can elevate domestic value addition in exports by strengthening backward linkages with transformation of plastic to textile. In addition, reducing reliance on foreign imports support to meet the double transformation criteria for post LDC graduation.

After graduation, the country will need to incur costs that are more indirect, it may rise from the opportunity loss for export divergence or entrance into the new market. In addition, LDC-specific support measures including financial assistance, international trade, and other general support measures will be withdrawn. RMG sector fall at great risk without the current facilities. At the same time reduction of access to external financing may cause balance-of-payments problems, which could put at risk the continuance of the progress (Rahman & Rahman, 2020).

6. Opportunities of Post LDC graduation with Man Made Fiber (MMF)

Now a days, world fashion demand is moving to circularity method with regenerate, narrow and slow concept. The relative significance of cotton in RMG has seen a decline over the past decade. While cotton apparel exports, in absolute terms, saw an increase from \$127 billion in 2005 to \$219 billion in 2021, MMF (Man Made Fiber)-based apparel more than doubled from \$126 billion to \$271 billion during the same time frame. Where Bangladesh's MMF and blended apparel exports remain around 25%. However, recycling plastic to textile could be a potential initiative to face the post LDC graduation challenges.

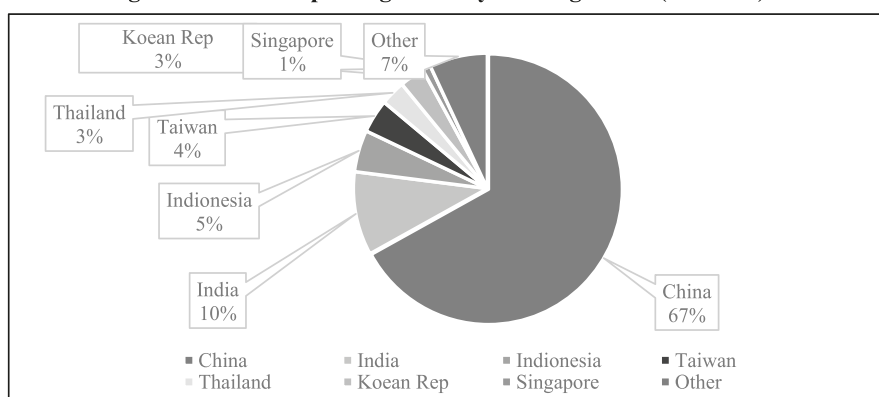
In Bangladesh most of the plastic products are made of thermos-plastic which can be recycles again and again (BPFMEA, 2024). In recent years due to lower costs, synthetic fibers have replaced natural fibers. Not only those synthetic fibers are durable and long lasting then cotton

fibers. This has made plastic materials one of the most important sources of the textile sector. Implementing circular economy principles in Bangladesh's plastic management could significantly mitigate the environmental threat posed by plastic pollution. Plastic could be reuse as circular way to made synthetic fiber and accessories for RMG sector. On the other hand, it brings economic sustainability by reducing import of Man-Made Fiber (MMF) and accessories resulting increase the domestic value addition by plastic recycling in addition fostering double transformation of RMG sector. It has been observed that global apparel products are dominated by MMF products, not only that it has been projected that cotton apparel market are become narrow in future. A contrasting export composition- World vs Bangladesh shows that, almost half of all global apparel exports are man-made fiber products, while 42% are cotton-based where 72% of Bangladesh's garment exports are cotton based apparel besides that 24% are man-made fibre based. Over the past ten years from 2010 to 2019 it has been observed that U.S. MMF apparel imports grew from \$23 billion to \$40.5 billion (average annual growth 6.5 %) and Cotton apparel imports during the same time declined by 1.2% annually. At the same time EU MMF apparel imports rose from \$45 billion to \$74 billion (average annual growth was 6.2%) and Cotton apparel growth was 1.3%.

7. LDC graduation with circularity

Rules of origin are an essential prerequisite for the utilization of trade preferences. Each preference scheme has its own set of rules of origin, be it an LDC-specific scheme, a general GSP or an RTA. In practice, rules of impact of LDC Graduation on the Textiles and Clothing Sector – 13 origin entail compliance with three components: (i) specific rules prescribing the realization of minimum manufacturing processes, local value addition or change of tariff classification (e.g. minimum 40% regional value content); (ii) specific requirements to prove that such rules have been met (e.g. certificates of origin); and (iii) the non-alteration of the goods during their transit to its preferential destination (i.e. direct consignment or non-alteration). If a good complies with the specific preferential origin requirements, it will be eligible for preferential treatment under the respective trade preferences. If it does not comply, it may still be imported but MFN duties will apply. (WTO, 2020). According to Rules of origin Bangladesh must meet the compliance by value addition by domestic material, specific certification of origin and non-alternate of goods during transit.

Figure 1: MMF importing Country of Bangladesh (FY 2021)

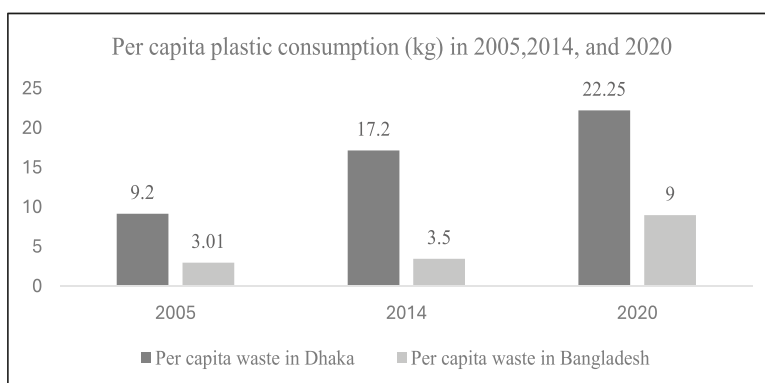


Source: ITC trade map (2024)

However, part of post LDC graduation preparedness specifically for (i) where clearly stated - realization of minimum manufacturing processes, local value addition by minimum 40% regional value content. Bangladesh could adopt circular approach by plastic to synthetic fiber (e.g. Man-Made Fiber) manufacturing. The chart (1) shows that currently Bangladesh importing Man Made Fiber from neighbor country. If Bangladesh going for domestic value addition by using own Man-Made Fiber, that supports to meet the Rules of Origin criteria of Post LDC graduation.

Bangladesh needs to adopt strategy to reduce reliance on MMF import and strengthening backward linkages industry and implement circular economy approach. This means reducing reliance on foreign imports, thus enhancing fibre security. On the other hand, Bangladesh has a lot of promise in the plastic to textile industry. Bangladesh's plastic pollution issue is made worse by a lack of efficient recycling programs and low public awareness. Plastics that are single-use are common, yet there is little infrastructure in place to collect, sift, and recycle them. Rivers are responsible for an estimated 2.8–18.6% of coastal plastic emissions, with Asian rivers accounting for 86% of the global inflow. (Lebreton et al., 2017). This is attributed to high-population density, high levels of waste mismanagement, and seasonal flood events (Hurley et al., 2018).

Figure 2: Per capita plastic consumption in Bangladesh



Source: World Bank (2021)

Only 2.2% of respondents considered other factors as challenges to attract FDI as Not trying for FDI, Indifference of the government to ensure policy and legal support to increase the rate of foreign investment in small and medium enterprises, Indifference of the government to the overall development of the jute sector, Inefficient and mismanaged Ministry of Finance, Bangladesh Bank and Banking Sector, Doing whatever the unscrupulous big business wants and with no accountability, Legal complexities in the field of TAX & VAT, Reliability issue. Scarcity of quality materials of construction materials.

In response to this growing environmental threat, the concept of circularity has gained attention as a potential way for plastic waste management. Where waste turns into resources. With an emphasis on waste reduction, product life cycle extension, and resource efficiency, circularity entails rethinking the production, use, and management of plastic. By embracing circularity, the current plastic pollution crisis can be mitigated. Circularity concept stands on 4 principle –

durability, recycling, reusing, and repurposing Fortunately, a global shift towards using recycled plastic for clothing offers a promising solution. Consumers, particularly in Western markets, are increasingly demanding eco-friendly garments made from recycled yarn. This trend presents a significant opportunity for Bangladesh to leverage its existing textile expertise and contribute to a more sustainable future. Now global fashion trend is more competitive and environmental conservation approach. Where plastic to textile concept brings an acceptance solution to reduce environmental pollution on the other hand business viability. Bangladesh needs to grab the opportunity to become a sustainable manufacturer by less harm to earth and step forward to global competitiveness.

Table 2: Top 10 MMF & blended apparels of Bangladesh and its share in total-apparel export

HS Code	Product	20-21 (Million BDT)	21-22 (Million BDT)	22-23 (Million BDT)	MMF Share (%) in total Apparel in 20-21	MMF Share (%) in total Apparel in 21-22	MMF Share (%) in total Apparel in 22-23
611030	Jerseys, pullovers and cardigans	1,298.57	1,968.02	1895.12	8.12	9.20	4.032
620343	Men's or boys' trousers	1,012.77	1,589.28	1,496.99	6.34	7.43	3.18
620193	Men's or boys; anoraks	553.93	713.08	40.93	3.46	3.33	0.087
620293	Women's or girls; anoraks	465.69	487.00	20.82	2.91	2.28	0.04
620640	Women's or girls' blouses	189.44	228.18	278.21	1.18	1.07	0.59
620463	Women's or girls' trousers excluding knitted or crocheted	181.24	377.87	538.64	1.13	1.77	1.14
610463	Women's or girls' trousers knitted or crocheted	154.75	267.02	283.29	0.97	1.25	0.60
620530	Men's or Boys' shirts	151.99	237.77	418.64	0.95	1.11	0.89
621040	Men's or Boys' garments of textile fabrics	148.46	231.13	243.69	0.93	1.08	0.52
621050	Women's or girls' garments of textile fabrics.	180.27	199.44	197.51	1.13	0.93	0.42

Source: Author owns calculation based on ITC trade map data (2024)

Above data shows that, in Fiscal Year 2021-2022 MMF blended apparel export increased with significant amount compared to previous year. Notably in Fiscal year in 2022-23 the export has been declined. So there need a proper nurturing for this sector to figure out the actual potentiality.

8. Post LDC graduation preparation by explore MMF apparel export:

Considering the trend growth rate of the last decade, \$625 billion global apparel market by 2030. If Bangladesh can achieve 12% of MMF apparel market share and 20% cotton apparel market by 2030. \$95 billion exports of Bangladesh by 2030.

Below The Revealed Comparative Advantage (RCA) analysis identifies the top 20 promising cotton and MMF & blended apparel with high RCA values.

Table 3: Most promising products and their export potential (value in USD million)

HS Code	Type	EU	US	UK	Japan	South Korea	Canada	Total
610342	Cotton	179	22	30	4.8	0.939	3.4	240.1
610711	Cotton	328	35	NAP	10	0.685	6.3	379.9
610510	Cotton	290	98	37	22	5.1	14	466.1
611120	Cotton	295	141	90	10	2.6	14	552.6
610462	Cotton	511	219	28	21	3.8	28	810.8
620520	Cotton	749	NAP	73	49	13	15	899.0
620462	Cotton	1326	202	74	39	19	13	1673.0
611020	Cotton	1048	424	152	52	11	53	1740.0
610910	Cotton	1499	404	201	222	53	73	2452.0
620342	Cotton	2370	NAP	130	66	43	43	2652.0
620530	MMF & Blended	60	NAP	NAP	6.9	4.1	3.9	74.9
610463	MMF & Blended	125	34	6	2.4	0	9.9	177.3
620463	MMF & Blended	155	11	NAP	10	4.1	NAP	180.1
620640	MMF & Blended	160.3	38	8.7	10	3.9	5	225.9
621040	MMF & Blended	210	NAP	30	7	0.244	NAP	247.2
621050	MMF & Blended	197	17	27	6.2	NAP	13	248.5
620293	MMF & Blended	348	NAP	32	2.7	8	NAP	390.7
620343	MMF & Blended	427	NAP	19	25	10	2.6	483.6
620193	MMF & Blended	452	NAP	48	9.7	1.8	NAP	511.5
611030	MMF & Blended	983	371	117	15	NAP	39	1525

Note: NAP stands for No additional Potential.

Source: Up scaling the RMG report (2024)

In the category of MMF and blended apparel, HS611030 (including jerseys, pullovers, cardigans, waistcoats, and similar items made from synthetic fibers, knitted or crocheted) presents a significant opportunity valued at \$1,525 million. Meanwhile, HS620343 and HS620193 also indicate considerable potential figures of \$483.6 million and \$511.5 million, respectively. The

cumulative export potential for the top twenty products in MMF and cotton across major export markets is approximately \$16 billion, with cotton apparel comprising about \$12 billion and MMF & blended apparel making up the remaining \$4 billion.

9. Benefits of circular textile economy

Circular economy approach offers number of benefits for Economy, environment and social aspect.

9.1. *Economic benefit*

A plastic-to-textile (Polyester) value chain promotes circular economy principles by utilizing resources efficiently and ensure economic benefits as well.

Table 4: Water Requirement to produce fiber based on fiber types

Staple Fibre	Water Footprint (L/kg)
Cotton	4342-6902
Hemp (bast)	3108
MMCF	352-520
L-MMCF	290
Polyester	84-143

In addition, A key approach to reduce a product's ecological footprint is to enhance its longevity via intentional design (European Court of Auditors, 2023). This emphasizes the need for RMG manufacturers to investigate more resilient materials. To save economic wastages. Now a days companies are using recycled materials can leverage a positive brand image associated with grab potential buyer as well as economic sustainability.

9.2. *Environmental Benefit*

A circular textile economy enhances a long-term environmental benefit as well. When compared to utilizing virgin materials, the European Environment Agency claims that using recycled plastics can save anywhere from 30% to 80% of energy. Furthermore, according to the Carbon Trust, up to 1.5 tonnes less CO2 emissions can result from recycling plastics for every tonne of recycled plastic. (Ellen Macarther Foundation, July 15, 2024). Not only that, A major environmental concern associated with cotton farming is its tendency to lead to soil erosion and alter the composition of the soil. The extensive land area required for cotton growth presents another significant challenge. In 2016, cotton represented one-third of the world's fiber production, utilizing 27 percent of the land designated for its cultivation (CIRFS, 2017). In comparison, synthetic polymer MMF, which accounted for 68 percent of global fiber production, essentially eliminated the need for land use.

9.3. Social Benefits:

Utilization of plastic into textile reduce environmental pollution as well as community pollution. Resulting healthy, safe and decent working environment for RMG employee and community people. Besides that, currently 4.1 million employees where 65% are female are working RMG sector and 1.5 million employees where 18% of female employees are involve this sector. There has a projection that if plastic to textile circularity works properly, it creates additional 3 million employment in this sector (BPGMEA).

10. Recommendation for transition of LDC though circular economy approach:

Bangladesh is the nation poised to graduate based on all three criteria of the CDP. To achieve sustainable graduation, Bangladesh must effectively and efficiently pinpoint the signs of graduation, potential consequences, and alternative scenarios. This research suggests the following strategy that the government should adopt for a seamless transition from LDC to MIC. Below given the possible recommendation on circular textile economy approach by plastic to textile transformation for policy makers to make this sector sustainable-

- Proactive efforts to secure favourable market access after LDC graduation can significantly enhance diversification prospects into MMF products while reinforcing the strength of cotton apparel.
- Encouraging the circular economy to improve the textile industry's sustainability through plastic to textile transition and less resource using mechanism is essential for industry readiness and preserving global competitiveness in a market that is becoming more and more environmentally sensitive.
- Government should create a separate technological fund for MMF entrepreneur to set up MMF industry.
- Proper mapping and required infrastructural support for plastic collection, segregation and plastic recycling is essential to foster the MMF production as well as reduction of environmental pollution.
- Government need reinforce in waste collection method where plastic waste could be collected in separate manner and send it to recycler.
- Government needs to take immediate implication and action on Extended Producer Responsibility (EPR) policy. Which aimed to control plastic pollution in Bangladesh.
- Take into account a two-pronged expansion plan for Bangladesh's garment industry: Increasing MMF apparel production and exports while solidifying market dominance in cotton apparel exports.
- Industries that concentrate on recycling PET bottles, flakes, plastic debris, and petrochemical processes ought to receive incentives. Additionally, it is necessary to examine the export of essential raw materials needed for the manufacturing of man-made fiber.
- Particularly attention should be paid to developing a fiber security plan for the apparel sector that diversifies the sources of both natural and synthetic fiber and increases domestic MMF capacity.

11. Conclusion:

Bangladesh's economy heavily depends on the ready-made garment (RMG) sector, which boosts both GDP and export revenue. The RMG sector will have to contend with issues like declining trade preferences resulting impose duty fee during export resulting growing production costs leads possibility of lose buyer. The export basket is highly concentrated in the RMG sector, meaning the implementation of tariffs can lead to a recession in garments, which is the largest source of employment in the industrial sector. Consequently, product diversification is essential, along with the improvement of strategies. So, it is necessary to developing effective policy and strategy to save this sector. There need to take initiative for strengthening backward linkage industries, national value addition by facilitating Man Made Fiber (MMF) manufacturing, product diversification by circular textile approach, market competitiveness to sustainable practice by production process, and explore new market access.

References

- Ahmed, Z., Mahmud, S., & Acet, H. (2022). Circular economy model for developing countries: Evidence from Bangladesh. *Heliyon*, 8(5), e09530. <https://doi.org/10.1016/j.heliyon.2022.e09530>
- Barrie, J., & Schroder, P. (2022). Circular economy and international trade: A systematic literature review. *Circular Economy and Sustainability*, 2(2), 447–471. <https://doi.org/10.1007/s43615-021-00119-9>
- Bocken, N. M., De Pauw, I., Bakker, C., & Van Der Grinten, B. (2016). Product design and business model strategies for a circular economy. *Journal of Industrial and Production Engineering*, 33(5), 308–320. <https://doi.org/10.1080/21681015.2016.1172124>
- Chaity, N. S., Islam, K. Z., Masud, A. A., Islam, M. F., Rahman, M. K. H., & Kabir, S. B. (2025). Sustainable pathways to circular economy adoption: Insights from the RMG sector of Bangladesh. *Business Strategy and the Environment*, 5857–5868. <https://doi.org/10.1002/bse.4274>
- CIRFS: World Production by Fibre. (2025, April 17). CIRFS – European Man-Made Fibres Association. <https://www.cirfs.org/statistics/key-statistics/world-production-fibre>
- European Court of Auditors. (2023, July 3). Special report 17/2023: Circular economy – Slow transition by member states despite EU action. <https://www.eca.europa.eu/en/publications?ref=SR-2023-17>
- Hossain, S., Rahman, M. A., Chowdhury, M. A., & Mohonta, S. K. (2021). Plastic pollution in Bangladesh: A review on current status emphasizing the impacts on environment and public health. *Environmental Engineering Research*, 26(6), 200535. <https://doi.org/10.4491/eer.2020.535>
- Islam, M. S. (2011). Prospects and challenges of plastic industries in Bangladesh. *Journal of Chemical Engineering*, 26(1), 16–21.
- Islam, T., Li, Y., Rob, M. M., & Cheng, H. (2022). Microplastic pollution in Bangladesh: Research and management needs. *Journal of Environmental Pollution*, 308, 119697. <https://doi.org/10.1016/j.envpol.2022.119697>

- Kirchherr, J., & van Santen, R. (2019). Research on the circular economy: A critique of the field. *Resources, Conservation and Recycling*, 151, 104480. <https://doi.org/10.1016/j.resconrec.2019.104480>
- Lawson, L., Degenstein, L. M., Bates, B., Chute, W., King, D., & Dolez, P. I. (2022). Cellulose textiles from hemp biomass: Opportunities and challenges. *Sustainability*, 14(22), 15337. <https://doi.org/10.3390/su142215337>
- Lewandowski, M. (2016). Designing the business models for circular economy—Towards the conceptual framework. *Sustainability*, 8(1), 43. <https://doi.org/10.3390/su8010043>
- LDC Graduation and the WTO: Assisting LDCs to Address the Trade-Related Implications of Graduation from LDC Status – Impact of LDC Graduation on the Textiles and Clothing Sector. (2021). United Nations Department of Economic and Social Affairs (UN DESA). <https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/Garment-Study-Trade-WTO.pdf>
- Rahman, M. (2024, February 27). Intra-RMG diversification: The next frontier. *The Daily Star*. <https://www.thedailystar.net/anniversary-supplement-2024/innovation-key-the-future/news/intra-rmg-diversification-the-next-frontier-3548301>
- Rahman, M. Z., Sony, M., Rubel, M. S. H., Alam, M., & Liza, R. A. (2020). Steps toward smooth graduation of Bangladesh from least developed countries. *Journal of Contemporary Research in Social Sciences*, 2(3), 57–67.
- Razzaque, M. (2022). Man-made fibres for moving up the apparel value chain in the context of LDC graduation. *RAPID*. https://www.rapidbd.org/wp-content/uploads/2022/11/2022-Man-made-fibres-apparel_Dr-Razzaque_4Oct22.pdf
- Razzaque, M. A., Akib, H., & Rahman, J. (2020). Bangladesh's graduation from the group of LDCs: Potential implications and issues for the private sector. *Navigating New Waters*, 53.
- Sarker, M. N. I., Wu, M., Alam, G. M., & Shouse, R. C. (2020). Administrative resilience in the face of natural disasters: Empirical evidence from Bangladesh. *Disasters*, 6(7), 1–13. <https://doi.org/10.1111/disa.12491>
- Sarker, M. N. I., Yang, B., Yang, L., Huq, M. E., & Kamruzzaman, M. M. (2020). Climate change adaptation and resilience through big data. *International Journal of Advanced Computer Science and Applications*, 11(3), 533–539. <https://doi.org/10.14569/IJACSA.2020.0110367>
- Schroeder, P., Anggraeni, K., & Weber, U. (2019). The relevance of circular economy practices to the sustainable development goals. *Journal of Industrial Ecology*, 23(1), 77–95. <https://doi.org/10.1111/jiec.12732>
- The World Bank. (2021, December 23). Meeting Bangladesh's plastic challenge through a multisectoral approach. <https://www.worldbank.org/en/news/feature/2021/12/23/meeting-bangladesh-s-plastic-challenge-through-a-multisectoral-approach>
- UNCTAD. (2025, July 31). Ending plastic pollution: Why trade matters. <https://unctad.org/news/ending-plastic-pollution-why-trade-matters>