Anonna_RP_senior_IARCO - Tasnuva Tabassum Anonna.pdf

by Sanaul Haque

Research Proposal

on

Designing a Factory-Level Roadmap for Circular Transition in Bangladesh's RMG Sector: A Mixed-Methods Approach.

Full Legal Name	Tasnuva Tabassum Anonna
Institution	Bangladesh University of Textiles
Category	Senior
Class/Grade/Year	BSc
Country	Bangladesh
Major (if senior)	STEM
Submission Date	September 30, 2025
Registered Email Address	tasnuvatabassumanonna@gmail.com

Research Aim: To pilot and conceptually design a roadmap for transitioning from linear to circular models in Bangladesh's RMG industry by integrating SSCM and CE practices using a mixed-methods approach.

Research Questions: 1. How are selected Bangladeshi garment factories currently implementing circular practices within their supply chains? 2. What are the key enablers and barriers to moving from linear to circular models in these factories? 3. How do quantitative measures of sustainability performance relate to qualitative perceptions of CE practices at the factory level?

Introduction:

1. **Environmental consequences of the linear model in fashion:** The global fashion industry operates on a largely linear "take–make–dispose" model that consumes vast amounts of water, energy and raw materials and generates enormous textile waste and pollution. In Bangladesh, the ready-made garment (RMG) sector—the world's second-largest apparel exporter employing over 4 million people—has been identified as a major source of these impacts [1], [2]. Although Circular Economy (CE) practices such as recycling, reuse, and eco-design have emerged worldwide to cut resource use and pollution [3], their adoption in Bangladesh's garment sector remains limited.

2. **Current initiatives in Bangladesh's RMG sector:** Some isolated initiatives have appeared, such as Reverse Resources' digital waste marketplace and Filotex Ltd.'s closed-loop production, but most CE practices are still fragmented and largely confined to recycling [4]. Sustainable Supply Chain Management (SSCM) offers an operational backbone for implementing CE by embedding environmental and social criteria into sourcing, production, and distribution decisions, yet evidence of how SSCM and CE interact inside Bangladeshi factories is scarce [1].

3. **Importance of the research**: Understanding how SSCM and CE practices function within actual factories is critical because it directly affects environmental performance, cost efficiency, and compliance with global buyers [1], [3]. Identifying enablers and barriers at the factory level can inform more effective policies, supplier training, and technology investments [4]. In the long term, such knowledge can help Bangladesh strengthen its competitiveness, meet Sustainable Development Goals (SDGs), and serve as a model for other developing countries transitioning to circular fashion [2], [3].

4. **Research goals:** However, previous studies either examine SSCM and CE separately or rely mainly on single-method surveys. No published research integrates quantitative and qualitative data from actual garment factories to develop a practice-based roadmap for CE transition in Bangladesh's RMG sector. This study addresses that gap by piloting a mixed-methods case study approach to design such a roadmap.

Literature Review:

1. **Recent Research on SSCM and CE Practices in Bangladesh's Garment Sector**: Research has established that Sustainable Supply Chain Management (SSCM) practices such as green sourcing, supplier collaboration, and waste minimisation can drive Circular Economy (CE) adoption and improve environmental and social performance in Bangladeshi manufacturing. Moktadir et al. used a quantitative survey to show significant positive links between SSCM practices and CE outcomes in green garment firms [1]. The ICMIEE22-191 study extended this to the clothing industry by outlining

seven CE principles—including eco-design, sustainable purchasing and industrial ecology—and documenting barriers such as high costs, technological limitations and lack of skilled labour that hinder their implementation [4]. Ahmed et al. mapped CE practices across multiple sectors in Bangladesh and found that initiatives remain fragmented and largely recycling-focused, with weak policy support and uneven enforcement [3]. Additional qualitative case studies of composite garment firms have reported further obstacles such as weak management support, limited technology and low awareness, but without a quantitative component to generalise findings, while recent quantitative surveys of over 300 managers have modelled SSCM–CE–performance relationships but lacked qualitative factory observations or in-depth case narratives [5], [6].

2. **Gaps in Prior Research:** There is an evident lack of mixed-methods research at factory level that integrates measured relationships with qualitative insights. Existing work either uses surveys or interviews alone and often treats SSCM and CE separately.

3. **Implications for Research Design and Focus:** This literature gap informs the focus of the present study on developing a conceptual, practice-based roadmap by piloting a mixed-methods case study approach. By examining both measurable SSCM–CE relationships and contextual enablers and barriers inside real factories, the research aims to provide actionable insights for managers and policymakers seeking to accelerate the transition from linear to circular models in Bangladesh's ready-made garment industry.

Proposed Methodology:

This study combines a pragmatic philosophy—recognising both measurable patterns and rich contextual insights—to answer "what works" for CE transition in real garment factories.

1. **Data Collection & Preprocessing**: 3–4 sustainability-oriented garment factories in Dhaka/Narayanganj will be purposively selected to represent varying sizes and buyer profiles. Within each, about 10–15 managers and sustainability officers will be surveyed (total ~40–50 respondents) and 8–10 interviewed. A structured online/onsite survey will collect quantitative data on SSCM and CE practices, costs, and performance indicators. In parallel, semi-structured interviews with managers and floor supervisors will gather qualitative data on barriers, enablers, and perceptions. All responses will be anonymised, coded, and cleaned for consistency.

2. **Quantitative Analysis:** Quantitative data will be analysed using descriptive statistics and exploratory PLS-SEM to identify relationships between SSCM practices, CE practices and performance.

3. **Qualitative Analysis:** Qualitative data thematically coded to extract recurring enablers, barriers and contextual factors. Findings triangulated to develop a practice-based roadmap for CE transition.

4. **Triangulation and Roadmap Design:** Findings from the quantitative and qualitative phases will be triangulated to identify converging or diverging patterns. Based on this evidence and best practices from the literature, a practice-based roadmap for CE transition at factory level will be conceptually designed.

5. **Validation and Recommendations:** Draft roadmap elements will be validated through a small expert focus group (buyers, regulators, and industry associations).

Recommendations will then be refined to highlight practical steps, training needs, and policy levers to scale CE practices in Bangladesh's RMG sector.

Timeline:

- Month 1: finalize tools, ethics, and pilot
- Month 2: run surveys and interviews
- Month 3: clean, code, and analyse data
- Month 4: triangulate results, draft the roadmap.

Expected Outcome:

A pilot framework integrating SSCM and CE practices at factory level that identifies key enablers and barriers to circular transition in Bangladesh's RMG sector. It will identify key enablers and barriers to CE adoption, demonstrate measurable relationships between SSCM and CE practices, and provide actionable recommendations for managers, policymakers and industry associations to scale up circular fashion.

Potential Limitation:

Small sample size and limited access may reduce generalisability but still offer rich, context-specific insights.

Conclusion:

The study will fill a major research gap and deliver a practical roadmap to accelerate Bangladesh's shift from linear to circular apparel production.

Project Practicalities:

Four-month mixed-methods project requiring survey software, travel funds, transcription, and ethical approval for data collection.

Post-program Plan:

Share findings with participating factories, present at conferences, and submit for publication to guide larger follow-up studies

References:

[1] M. A. Moktadir, T. Rahman, and S. M. Ali, "Drivers to sustainable manufacturing practices and circular economy: A perspective of leather industries in Bangladesh," *J. Cleaner Prod.*, vol. 174, pp. 1366–1380, 2018, doi: 10.1016/j.jclepro.2017.11.063.

[2] K. Saha, P. K. Dey, and E. Papagiannaki, "Implementing circular economy in the textile and clothing industry," *Bus. Strategy Environ.*, vol. 30, no. 4, pp. 1497–1530, 2021, doi: 10.1002/bse.2670

[3] Z. Ahmed, S. Mahmud, and H. Acet, "Circular economy model for developing countries: Evidence from Bangladesh," *Heliyon*, vol. 8, e09530, 2022, doi: 10.1016/j.heliyon.2022.e09530

[4] K. R. Hossain, L. M. Baral, R. S. Ahmed, A. S. M. A. Rahman, and F. Shahriar, "Opportunities and Challenges for Bangladesh's Clothing Industry in the Circular Economy," in *Proc. 7th Int. Conf. Mechanical, Industrial and Energy Engineering (ICMIEE)* – Part II, SciEn Conf. Series: Engineering, vol. 2, pp. 65–70, Khulna, Bangladesh, Dec. 22–24, 2022, doi: 10.38032/scse.2025.2.14

[5] M. T. Islam and M. A. Jabber**,** "Challenges of establishing a circular economy: A case study of readymade garments sector in Bangladesh," *Dhaka Univ. J. Manage.*, Jun. 2022, doi: 10.57240/DUJMJUNE03.

[6] M. S. Islam, M. R. B. Rubel, N. N. Rimi, M. Bin Amin, and P. Quadir, "Attaining sustainable excellence: Investigating the impact of sustainable SCM and circular economy on green garment industry in Bangladesh," *Sustainable Futures*, vol. 8, 100234, Jun. 2024, doi: 10.1016/j.sftr.2024.100234

| 8 | aust.edu | <1% |
| | Internet Source | |

| 9 | link.springer.com | <1% |
| | Internet Source | |

| Exclude quotes | On | Exclude matches | Off |
| Exclude bibliography | Off | | |