University of Sopron
Alexandre Lamfalussy Faculty of Economics

Sustainable Leadership and Sustainability Performance of the Ready-made Garments (RMG) Industry in Bangladesh

Theses of the doctoral (PhD) dissertation

Written by:
Md. Sadrul Islam Sarker

Supervisor:
Dr. Istvan Janos Bartok

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Doctoral School: István Széchenyi Economics and Management Doctoral School

Head of the Doctoral School:
Prof. Dr. Csilla Obadovics, PhD

Programme:
…….

Supervisor: Dr. Istvan Janos Bartok

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Approval signature of supervisor

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1. INTRODUCTION

1.1 Background of the Study

Due to resource- and labor-intensive and highly polluting features of the Ready-made garment (RMG) manufacturing industry, sustainability performance has become imperative to survive in the changing market environment (Gomes et al., 2024; Sajjad et al., 2024). Despite a 2% contribution to the world's gross domestic product (GDP) and more than 300 million employment, the global textile and apparel industries account for 10% of the world's carbon footprint and 20% of global wastewater and unfair labor treatment (European Parliament, 2024; Sarker & Bartok, 2024; Shamsuzzaman et al., 2023). Threfore, the RMG companies must integrate social equity, economic efficiency, and environmental initiatives into their operations to achieve sustainable firm performance (Li, 2022) . In addition, global efforts such as the Paris Agreement, the European Green Deal, the UN 2030 agenda, national environmental regulation, and growing public awareness push apparel manufacturing companies to adopt sustainability practices to minimize the world's grand challenges (Zheng et al., 2022) .

However, a firm's sustainability performance depends on effective leadership that embeds sustainable practices into their organizations and communities while stimulating economic development (Burki et al., 2018; Foo et al., 2021). Numerous scholars have highlighted sustainable leadership as an effective

form of leadership to enhance sustainability performance of a company (Ahsan & Khawaja, 2024; Foo et al., 2021; Lim et al., 2022; Suriyankietkaew, 2023) . This sustainable leadership fosters a sense of connection and empathy, as it aims to balance between current profitability and future growth along with initiatives that uplift the overall wellbeing of all stakeholders (McCann & Sweet, 2014; Yadegaridehkordi et al., 2023). It integrates sustainability principles across individual, organizational, and societal spheres to enhance stakeholder relationships and facilitate sustainable organizational development (Avery & Bergsteiner, 2011; Baird et al., 2023).

However, past empirical research on the relationship between leadership and sustainability performance has not reached a consensus. Some studies have documented leadership practices' positive and significant impact on sustainability performance (Aman-Ullah et al., 2024; Borah et al., 2022; Esangbedo et al., 2024; Nasir et al., 2022). On the other hand, the studies conducted by Foo et al. (2021) and Hossain et al. (2024) revealed that leadership has a non-significant impact on the manufacturing industry's sustainability performance. Consequently, the researcher of this study contended that further research is necessary to comprehensively comprehend the concepts of sustainable leadership and sustainability performance and examine the relationship between them.

In addition, little is known about the mechanisms behind the relationship between sustainable leadership and sustainability performance. The undelying mechanisms through which sustainable leadership contributes to sustainability performance have not been extensively examined. Therefore, scholars (Baird et al., 2023; Iqbal et al., 2020; Tian & Wang, 2023) have suggested investigating the relationship between sustainable leadership and sustainability performance, considering the mediating effects. They have argued that sustainability performance of a firm can also be improved not only by employing leadership but also through other factors such as sustainability-oriented dynamic capabilities and Industry 4.0 technologies adoption (Borah et al., 2022; Khan et al., 2023; Saha et al., 2022).

Even though the existing studies have evidenced that green dynamic capabilities and I4.0 adoption can enhance different aspects of sustainability performance, the combined influence of leadership, green dynamics and Industry 4.0 on the complete sustainability performance still needs to be explored. Hence, this study incorporates green dynamic capability and Industry 4.0 adoption as the mechanisms combinely in the relationship between sustainable leadership and sustainability performance to fill the gap in the literature.

The purpose of this study is to comprehensively understand sustainable leadership and sustainability performance from the managerial perspectives and experiences and develop a structural

model of sustainable leadership, green dynamic capabilities, Industry 4.0 adoption and sustainable organizational performance that can hypothesize cause and effect and the mediating relationships in the context of Ready-made garments (RMG) industry in Bangladesh, which owns the significant growth in the world.The study focuses on a specific context, namely the Bangladeshi RMG manufacturing industry because Bangladesh emerged as the second-largest global exporter of ready-made garments (RMG) in 2019, capturing 6.8% of the international apparel market (WTO, 2021) and owning the highest number of green clothing factories around the world (BGMEA, 2023; Sarker et al., 2023). The RMG industry plays a substantial role in the socio-economic development of the country, employing around 4.1 million employees and generating 84.58 percent of the total export earnings of the nation (BGMEA, 2023; Habib et al., 2022; Khairul Akter et al., 2022). Despite their achievements, RMG factories in Bangladesh are often criticized for issues such as unsafe working conditions, violations of workers' rights, wage discrimination, environmental pollution, and overall poor health and safety of workers (Karanikas & Hasan, 2022; Nabi et al., 2023) . As an export-driven sector, the RMG industry in Bangladesh heavily relies on foreign buyers. At the same time, most buyers, especially the leading apparel brands H&M, Zara, Marks & Spencer, and so forth, underscore the necessity for garment suppliers to adhere to environmental and social compliance (Uddin et al., 2023).

Therefore, it is necessary to develop a sustainable performance framework for the RMG industry in Bangladesh to remain competitive and resilient in the global apparel market.

1.2 Problem Statement

The central problem addressed in this study was the issue of sustainability performance in the RMG industry. Sustainability performance has become a significant concern in the RMG manufacturing industry as it causes serious environmental and social problems such as wastewater, carbon footprint, pollution, unfair labour treatments, occupational health and safety, and unsafe working conditions (Cai & Choi, 2020; Shumon & Rahman, 2022). As a result, the clothing sector is required by regulatory agency and stakeholders to take a leading role in adopting sustainabilty initiatives into the operations.

Though sustainability practices have a transformative impact on global economies, Bangladesh's ready-made garments (RMG) industry experiences challenges in adopting these practices (Nabi et al., 2023). The integration of sustainability into the operations and business decision-making of the RMG industry is still questionable.Therefore, this sector generates adverse outcomes in terms of environmental, social, and economic indicators such as carbon footprint, labour unrest, and downward market competitiveness (Islam, 2021; Kravchenko et al., 2019; Shamsuzzaman et al., 2021; Shaw et al., 2023). However, reducing textiles' negative impacts while generating business opportunities

and safe and just employment highlighted the urgent need for sustainable practices and leaders who could foster sustainable practices and enhance sustainability performance (Eikelenboom & de Jong, 2019; Yuan & Cao, 2022). Sustainable leadership has emerged as a potential solution to address sustainability challenges and promote sustainability performance (Ahsan & Khawaja, 2024; Al-Zawahreh et al., 2019; Suriyankietkaew & Kungwanpongpun, 2022). Sustainable leaders can integrate sustainability into organizational environments and enhance stakeholder relationships, thereby promoting sustainable development (Baird et al., 2023) .

Although the empirical studies (Iqbal & Ahmad, 2021; Xin et al., 2024) have well-documented the positive relationship between sustainable leadership and sustainability performance in different context, existing literature ignored to the unique issues specific industries face, particularly the RMG industry (Nguyen et al., 2021; Hossain et al. 2024).

To the best knowledge of the researcher, no empirical study has yet been conducted to identify and measure sustainable leadership and sustainability performance, as well as investigate their relationship with green dynamic capabilities and Industry 4.0 adoption. This study attempted to address the significant environmental, social, and economic sustainability performance issues identified as a foundation of this research by adopting an exploratory sequential mixed method.

1.3 Research Objectives

The specific research objectives are as under:

RO1: To explore the factors influencing sustainable leadership and sustainability performance in the context of the RMG industry in Bangladesh.

RO2: To examine the effect of sustainable leadership on the sustainability performance of the RMG industry in Bangladesh.

RO3: To assess the influence of green dynamic capabilities on the sustainability performance of the RMG industry in Bangladesh.

RO4: To investigate the impact of Industry 4.0 adoption on the sustainability performance of the RMG industry in Bangladesh.

RO5: To determine the mediating role of green dynamic capabilities and Industry 4.0 adoption on the relationship between sustainable leadership and sustainability performance of the RMG industry in Bangladesh.

1.4 Hypothesis Development

H_1: Sustainable leadership positively affects sustainability performance.

H_2: Sustainable leadership positively affects green dynamic capabilities.

H_3: Sustainable leadership positively affects Industry 4.0 adoption.

H_4: Green dynamic capabilities positively affect sustainability performance.

H_5: Industry 4.0 adoption positively affects sustainability performance.

H_6: Green dynamic capabilities positively affect the relationship between sustainable leadership and sustainability performance.

H_7: Industry 4.0 adoption positively affects the relationship between sustainable leadership and sustainability performance.

2. RESEARCH METHODOLOGY

The research adopted sequential exploratory mixed-method research to fulfil the study's objective. As sustainable leadership and sustainability performance constructs were context-specific, this study's construct dimensions and indicators were identified from the literature and contextualized and validated by a qualitative field study with senior managerial professionals in the RMG sector in Bangladesh. Data obtained from the semi-structured interview were analysed through thematic analysis techniques with the support of the NVivo 14 software package. Subsequently, the findings from the thematic analysis of the qualitative field study were compared with the content analysis of the existing literature, and the researcher developed a second-order hierarchical research model, which was empirically validated using a quantitative research approach. Moreover, the study's target population was the RMG industry in Bnagladesh, and the unit of analysis included individual garment companies in Bnagladesh. The study adopted purposive sampling for qualitative field study and simple random sampling for quantitative survey. In the quantitative phase, 355 usable survey responses were obtained using a self-administered questionnaire. A point Likert scale was used to obtain the

respondents' perceptions of study variables. Collected survey data were analyzed using the partial least square (PLS)--based structural equation modeling (SEM) technique to test the hypothesized relationship in the proposed model.

3. RESULTS

The qualitative study of this research helps fulfill the first research objective by identifying the factors and indicators of sustainable leadership and sustainability performance in the RMG industry in Bangladesh. Besides, this study's qualitative field study result supported the literature review findings for the contextual validity of the study variables. As a result, the study developed a research model. The research model is presented in Figure 1 :

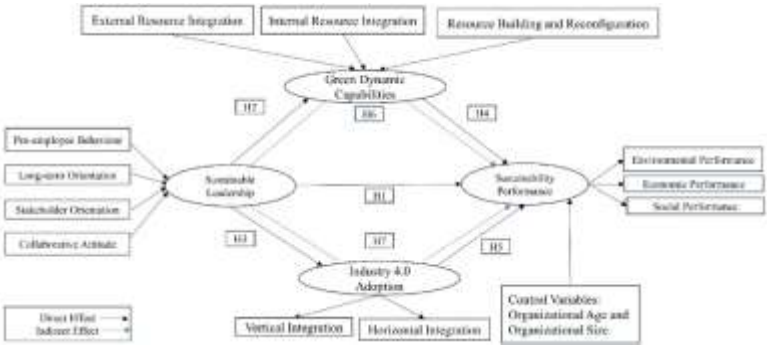

Figure 1: Proposed research model

Source: Researcher's construction

The quantitaive study revealed the hypothesized relationship in the proposed research model.

Hypothesis H1: Sustainable leadership has a positive and significant impact on sustainability performance

The statistical result of this study indicated that sustainable leadership positively and significantly influence the sustainability performance of RMG companies in Bangladesh with beta-value 0.258, t-value 5.294 and p-value 0.000, and proving the theoretical relationship that SL represented by pro-employee behaviour, long-term orientation, stakeholder orientation and collaborative culture is crucial for enhancing environmental, economic and social performance.

Hypothesis H_2: Sustainable leadership positively affects green dynamic capabilities.

The study result statistically confirmed a significant positive effect of sustainable leadership on green dynamic capablities. The results (β=0.443, t=8.527, p=000) demonstrate that sustainable leadership is crucial in strengthening dynamic cabilities of a firm, and suggesting that green dynamic capablities depends significantly on sustainable leadership.

Hypothesis H_3: Sustainable leadership positively affects Industry 4.0 adoption.

The hypothesized relationship between sustainable leadership was validated statistically by the analysis of the findings (β=0.433, t=8.301, p=000). The findings align with Jayashree et al.(2022), who found that effective leadership can significantly shape

employee involvement and promote their participation in embracing digital technologies in the organization.

Hypothesis H_4: Green dynamic capabilities positively affect sustainability performance

This study affirmed a significant and positive relationship between green dynamic capabilities and sustainability performance. The results (β=0.117, t=2.653, p=0.008) validated green dynamic capabilities as a key antecedent for enhancing organizational sustainability.

Hypothesis H_5: Industry 4.0 adoption positively affects sustainability performance

The result of the study documented a significant link between I4.0A and SP (β=0.516, t=10.937, and p= 0.000) which produced evidence in support of the relationship between I4.0A and SP. It also states that the focus on I4.0A boosts sustainability performance.

Hypothesis H_6: Green dynamic capabilities positively affect the relationship between sustainable leadership and sustainability performance.

This study examined and confirmed the mediating role of GDC between SL and SP. The findings affirmed that a significant indirect effect of SL on SP through GDC ($\beta = 0.052$, $t = 2.437$, $p < 0.015$). In addition, it was observed that the total effect of SL on SP was significant ($\beta = 0.533$, $t = 10.999$, $p < 0.000$) with the

inclusion of the mediator GDC, the direct effect of SL on SP was still significant (β=0.258, t=5.294, p=000).

Hypothesis H_7: Industry 4.0 adoption positively affects the relationship between sustainable leadership and sustainability performance.

The result of this study revealed a significant indirect effect of SL on SP through I4.0A (β = 0. 222, t = 7.182, p < 0.000). The total effect of SL on SP was significant (β = 0.533, t = 10.999, p < 0.000) with the inclusion of the mediator I4.0A, the direct effect of SL on SP was still positive and significant (β=0.258, t=5.294, p=000). This result implies a complementary partial mediating role of I4.0A in the relationship between SL and SP. I4.0A as a mediating role was also aligned with previous studies (Kumar & Bhatia, 2021; Nasir et al., 2022).

3.1 New Scientific Results

1. This study developed and validated two hierarchical and multidimensional scales to measure sustainable leadership and sustainability performance. Besides, the study empirically confirmed that pro-employee behaviour, long-term orientation, stakeholder orientation and collaborative attitude are the four dimensions of sustainable leadership constructs while three dimensions of sustainability performance are environmental performance, economic performance and social performance.

2. The use of mixed method in leadership research is underdeveloped whereas this research employed qualitative and

quantitative approach to answer the research questions employing SEM analysis at the organisational level making novel methodological contribution in this field.

3. The present research is the first study that found a direct positive relationship between sustainable leadership and sustainability performance as hierarchical and composite variables. All the variables in this study are multidimensional, and the unique findings show that the relationship between all the variables is statistically significant.

4. The study found a complementary mediating impact of the green dynamic capabilities and Industry 4.0 adoption, two variables, a new addition to the existing research.

5. The study combined two theories: sustainable leadership theory and dynamic capability view theory to overcome the limitations of the theoretical perspectives of both theories, which facilitated to advance of the theory. This is also unique in the literature.

6. The study revealed contextual uniqueness by investigating the structural relationship between sustainable leadership, green dynamic capabilities, Industry 4.0 adoption and sustainability performance in the RMG manufacturing industry in Bangladesh.

4. CONCLUSIONS, RECOMMENDATIONS AND FUTURE RESEARCH DIRECTIONS

The current study aimed to explore the factors of sustainable leadership and sustainability performance in the context of the

RMG industry in Bangladesh and examine the proposed research model developed based on existing studies. The study first reviewed the relevant literature to identify the factors of sustainable leadership and sustainability performance and then conducted semi-structured interviews. Based on the literature and qualitative field study findings, a research model was developed and tested to validate the structural relationship by collecting cross-sectional survey data from 355 garment companies in Bangladesh. Specifically, the study examined the direct effects of sustainable leadership on green dynamic capabilities, Industry 4.0 adoption and sustainability performance, and the mediating effect of green dynamic capabilities and Industry 4.0 adoption on sustainability performance. As one of the initial studies, this research provides empirical evidence supporting the relationship among sustainable leadership, green dynamic capabilities, Industry 4.0 adoption and sustainability performance. The study findings uncovered that sustainable leadership positively and directly influences green dynamic capabilities, Industry 4.0 adoption and sustainability performance. The study also confirmed positive and significant indirect effects of sustainable leadership on sustainability performance through green dynamic capabilities and Industry 4.0 adoption. The findings of the study have several theoretical, practical and policy implications.

The researcher has proposed some recommendations for leaders, entrepreneurs, professionals, scholars , policymakers and

other agencies based on the findings and conclusions of this study. However, the study has some geniric limitations that can be minimised by conducting further studies. For example, the study focused only on the compositie impact the composite future researchers may conduct research on the dimensional impacts of newly developed sustainable leadership on triple-bottom-line dimensions. Other limitations are concerning limited mediators, absence of moderators, cross-sectional research design, sampling and data collection issues. The researcher suggested some directions for future studies considering the limitations of the present study.

5. SCIENTIFIC PUBLICATIONS

Sarker, M. S. I., & Bartok, I. (2024). Global trends of green manufacturing research in the textile industry using bibliometric analysis. Case Studies in Chemical and Environmental Engineering, 9, 100578. **D1**

Sarker, M. S. I., & Bartok, I. (2024). A Systematic Review of Green and Digital Transitional Factors in the Fashion Industry. Business Systems Research: International journal of the Society for Advancing Innovation and Research in Economy, 15(1), 1-21. **Q2**

Sinh, T. T. T., Nemeth, N., & **Sarker, M. S. I**. (2024). Digital marketing in community-based enterprises: A systematic literature review and research agenda. Journal of Open Innovation: Technology, Market, and Complexity, 100414. **Q1**

Sarker, M. S. I., & Bartók, I. J. (2023). A Bibliometric Review of Green Technology-Related Research in the Textile Industry. Textile and Leather Review, 6, 813-836. **Q3**

Sinh, T. T. T., Nemeth, N., & **Sarker, M. S. I.** (2024). Developing a perspective on the functions of marketing in the contents of sustainable tourism: a bibliometric analysis. Int. J. of Electronic Marketing and Retailing. **Q3 (Accepted for publication)**

Sarker, M. S. I., Hasan, K. M., & Bartók, I. J. (2023). Green Manufacturing Practices Towards Sustainable Development in the Ready-Made Garments (RMG) Industry of Bangladesh. **Conference proceedings**

Sarker, M. S. I., Bartok, I. & Sinh, T. T. T., (2024). Circular Economy Research Trends in the Textile and Apparel Industries: A Bibliometric Analysis. **Conference proceedings**

Sinh, T. T. T., Nemeth, N., **Sarker, M. S. I**., & Zhang Y. (2024). Community-Based Tourism in Southeast Asia **Conference proceedings**

Sinh, T. T. T., Nemeth, N., & **Sarker, M. S. I**. (2025). Past, Present, and Future Viewpoints on the Sustainability of Community-Based Tourism: A Bibliometric Study in Southeast Asia. **Conference proceedings**

Sarker, M. S. I (2024) Sustainability Management . **Book review**