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Eco-Friendly Retailing: A Case Study of Green Supply Chain Management by Superstores in Dhaka, Bangladesh

Mian Mohammad Rassel[1*], K. M. Tahsin Kabir[1], Md. Mortuza Ahmmed[2]
[1]Undergraduate Student, Department of Computer Science, American International University-Bangladesh
[2]Associate Professor, Department of Mathematics, American International University-Bangladesh
[*]*E-mail: 22-46992-1@student.aiub.edu*

Abstract

This study explores the technical application and outcomes of environmentally conscious retailing practices within the framework of green supply chain management (GSCM) in superstores across Dhaka, Bangladesh. As sustainability becomes more important in the retail industry, it is essential to understand the strategies used by these superstores. However, current research often overlooks the socioeconomic challenges and operational intricacies of emerging markets, leaving significant gaps in the effective integration of sustainability principles. To address these gaps, this study adopts a survey-based methodology, collecting data from 90 superstores to assess GSCM practices in sourcing, transportation, warehousing, and waste management. Correlation analysis reveals the relationships between sustainability initiatives and their outcomes, highlighting successful implementations such as sustainable packaging and optimized transportation routes while identifying key barriers including financial constraints, infrastructure challenges, and limited stakeholder awareness. The study also examines the motivations driving these efforts, such as increasing consumer demand for eco-friendly products, regulatory compliance, and corporate social responsibility (CSR) commitments. Despite facing challenges like inadequate infrastructure, financial limitations, and supplier readiness, the findings underscore the benefits of eco-friendly retailing, including enhanced brand reputation, cost savings, and a reduced environmental footprint. This research provides actionable insights for policymakers and retailers in emerging markets, offering a pathway to overcome challenges and advance sustainable practices in the retail sector.

Keywords: Correlation, supply chain, sustainability, logistics, GSCM.

1. Introduction

Environmental sustainability has become a global priority, driving businesses to integrate eco-friendly practices across industries. The retail sector, particularly superstores, plays a pivotal role in promoting sustainability due to its significant influence on supply chain operations and consumer behavior. Green Supply Chain Management (GSCM) incorporates environmental considerations at every stage of the supply chain, addressing challenges such as waste generation, energy consumption, and carbon emissions. In Dhaka, the rapidly expanding capital of Bangladesh, urbanization and economic growth have fueled the rise of superstores. However, this growth has also intensified environmental issues, including increased waste and energy usage. While superstores in Dhaka have begun adopting GSCM principles to mitigate these impacts, implementation remains inconsistent, hindered by financial limitations, inadequate infrastructure, and low stakeholder awareness.

This study examines the adoption of GSCM practices in Dhaka's superstores, focusing on areas such as sourcing, transportation, warehousing, and waste management. It investigates the challenges retailers face, including financial constraints and infrastructure gaps, while analyzing motivations like regulatory compliance, consumer demand for eco-friendly products, and corporate social responsibility (CSR) commitments. The research also highlights the potential benefits of GSCM, such as cost savings, enhanced brand reputation, and reduced environmental impact. Despite obstacles, GSCM presents a transformative opportunity for the retail sector, enabling superstores to align with global sustainability goals while addressing local environmental challenges effectively.

The contributions of this study are to:

1. Assess the current state of GSCM practices in Dhaka's superstores.
2. Identify barriers to effective GSCM implementation.
3. Analyze the motivations and benefits driving sustainability efforts.
4. Provide actionable insights for policymakers and corporate leaders to advance sustainable retailing.

This study offers valuable recommendations for fostering environmentally conscious retailing in emerging markets like Bangladesh.

2. Literature review

As a crucial part of contemporary business operations, GSCM incorporates environmental factors into the supply chain at every stage, from product design to the ultimate consumer delivery. The idea came from the larger discipline of supply chain management, which is concerned with the smooth and efficient movement of resources, data, and funds along the supply chain [1]. The environmental component is added by GSCM, which emphasizes lowering environmental impact through waste reduction, resource optimization, and carbon emission reduction [2]. Academics have emphasized the significance of GSCM in attaining sustainable development, acknowledging that conventional supply chain methods frequently lead to notable environmental deterioration [3]. The retail industry is essential to the implementation of GSCM policies since it is a large consumer of goods and a major point of contact between producers and consumers. Because they act as middlemen, retailers have a significant impact on supply chains [4]. By requesting environmentally friendly products, cutting down on wasteful packaging, streamlining delivery, and skillfully handling reverse logistics, they can promote sustainability [5]. The potential influence of GSCM procedures is much greater in the setting of superstores, which deal with a large variety of products and enormous sales volumes. Research has demonstrated that, in addition to environmental advantages, the application of GSCM in commerce can result in cost savings, enhanced consumer loyalty, and improved brand image [6]. Superstores have adopted various GSCM practices to align with sustainability goals. Key practices include green procurement, where superstores prioritize purchasing products from suppliers that adhere to environmentally friendly standards [7]. They also implement waste reduction strategies, such as recycling programs and reducing packaging materials [8]. Energy-efficient practices, like using LED lighting and energy-efficient refrigeration, have been widely adopted to minimize energy consumption [9]. Additionally, some superstores have introduced eco-friendly product lines to cater to environmentally conscious consumers [10]. The adoption of these practices varies based on factors like regulatory requirements, consumer demand, and the company's commitment to sustainability [11].

Bangladesh's main city, Dhaka, has experienced tremendous economic and urban development, which has fueled the rise of the retail industry. But along with this expansion have come environmental problems, like resource depletion, air pollution, and increased waste production [12]. In the context of Dhaka's retail industry, the idea of GSCM is relatively new, but because of these environmental issues, its significance is becoming more and more apparent [13]. To lessen their negative environmental effects, superstores in Dhaka have begun investigating GSCM techniques. These strategies include adopting energy-efficient technologies, putting waste management plans into place, and procuring locally produced goods to lower carbon footprints [14]. Despite these initiatives, obstacles include a lack of knowledge, a lack of funding, and poor infrastructure prevent GSCM approaches from being widely adopted [15]. Superstores have various obstacles to overcome when implementing GSCM procedures. The lack of knowledge and comprehension of GSCM among stakeholders, such as management, staff, and customers, is a significant obstacle [16]. Financial limitations are a major obstacle as well because implementing green practices and technologies sometimes necessitates large investments [17]. Furthermore, firms may be deterred from using GSCM techniques by a lack of government incentives and regulatory assistance [18]. Due to the deep embedded nature of old procedures in corporate operations, cultural considerations and resistance to change can potentially provide an obstacle to the successful implementation of GSCM [19]. The retail industry can reap numerous advantages from implementing GSCM, even with its limitations. Environmentally friendly behaviors improve the planet's overall health by minimizing greenhouse gas emissions, cutting down on energy use, and reducing waste [20]. By reducing waste and utilizing resources more effectively, GSCM can help firms save money [21]. Additionally, since consumers are valuing companies that show a commitment to sustainability, it can improve a company's reputation and brand image [22]. Moreover, GSCM procedures can enhance adherence to rules and guidelines, lowering the possibility of legal problems [23]. Superstores in Dhaka can gain a competitive edge in the market and contribute to environmental sustainability by using GSCM [24].

3. Methodology

This study's main goal is to evaluate how much superstores in Dhaka, Bangladesh, are implementing GSCM techniques. It will pay particular attention to environmental regulations, sustainability concerns, and the adoption of eco-friendly initiatives. Based on information gathered from a sample of 90 superstores in the city of Dhaka, analytical conclusions were made. A standardized questionnaire created especially for this study was used to collect data. A variety of questions intended to evaluate different facets of green supply chain management were included in the questionnaire. The observance of environmental laws and regulations, the confirmation of certificates relevant to environmental management systems, and the knowledge of environmental legislation concerning the supply and storage of goods were among the important topics discussed. The questionnaire also looked at the frequency and setup of workshops and seminars intended to teach suppliers about sustainable

practices, participation in tree planting campaigns, and the regularity of meetings by various branches or outlets to talk about environmental issues. All the variables investigated in the study are qualitative. For analytical purposes, these variables were measured using nominal scales.

$$Correlation = \frac{\mathrm{SP}(V1*V2)}{\sqrt{\mathrm{SS}(V1)\ \mathrm{SS}(V2)}} \quad (1)$$

$$\mathrm{SS}(V1) = \sum V1^2 - \frac{(\sum V1)^2}{N}\ , \mathrm{SS}(V2) = \sum V2^2 - \frac{(\sum V2)^2}{N}, \mathrm{SP}(V1 * V2) = \sum V1 * V2 - \frac{\sum V1 \sum V2}{N}$$

In Equation (1), ***V1*** and ***V2*** represent variables such as adherence to environmental rules and participation in tree-planting events, respectively, summed over ***N***, the total observations. ***SS (V)*** and ***SP (V1, V2)*** denote the sum of squares and covariance, capturing the variability and relationship between the variables. Summation Σ indices span all data points in the sample, ensuring consistency.

An essential statistical technique for this research is correlation analysis, which offers a way to quantify and comprehend the connections between different GSCM strategies and how they affect superstores in Dhaka, Bangladesh. This analysis helps determine which factors are most closely associated with the successful implementation of GSCM practices by looking at the correlation between various variables, such as business performance, employee awareness levels, compliance with environmental regulations, and participation in eco-friendly activities. It is essential to comprehend these interactions because they enable the study to identify the main forces behind sustainable practices and evaluate how well they work to improve company performance and environmental results. If a robust positive link is discovered between GSCM compliance and environmental awareness training, this would emphasize the significance of educational programs in encouraging sustainable practices. Furthermore, by establishing a connection between GSCM operations and measurements of business success, such profitability and customer happiness, the research can offer factual proof of the financial advantages of sustainability, which in turn will motivate more companies to implement green practices. Policymakers and corporate executives can benefit greatly from these insights, which provide data-driven suggestions for strategic choices and policy development targeted at advancing sustainability in the retail industry. The research hypotheses are validated by correlation analysis, which also aids in the derivation of significant conclusions that might direct superstores in Dhaka toward the more effective and efficient implementation of green supply chain management techniques.

4. Results and Discussion

The frequency distribution of superstore locations in the study is illustrated in Figure 1, divided into four groups: Shopno, Agora, MeenaBazar, and Others. The bar graph presents the number of outlets from each category in Dhaka, Bangladesh. Shopno, represented by the tallest bar on the left, has the highest number of outlets, totaling 32. This indicates Shopno's significant presence in the retail sector, making its Green Supply Chain Management (GSCM) policies crucial to the study's findings. Agora, represented by the second bar, has 28 outlets, positioning it as the second most-represented superstore chain. Although slightly smaller than Shopno's, Agora's participation highlights its pivotal role in Dhaka's retail industry and its potential influence on GSCM insights derived from the study. MeenaBazar, represented by the third bar, accounts for 19 outlets. While its presence is smaller than that of Shopno and Agora, MeenaBazar's inclusion provides valuable information on how medium-sized superstore chains implement GSCM strategies. The final category, "Others," represented by the shortest bar, has 11 outlets. This group comprises smaller superstore chains or independent stores. Despite their smaller representation, they offer essential perspectives on GSCM practices across diverse retail businesses beyond the larger chains. The study's findings will largely reflect the practices of the most represented superstores, particularly Shopno and Agora, while also incorporating insights from medium and smaller chains, creating a comprehensive understanding of GSCM in Dhaka's retail sector.

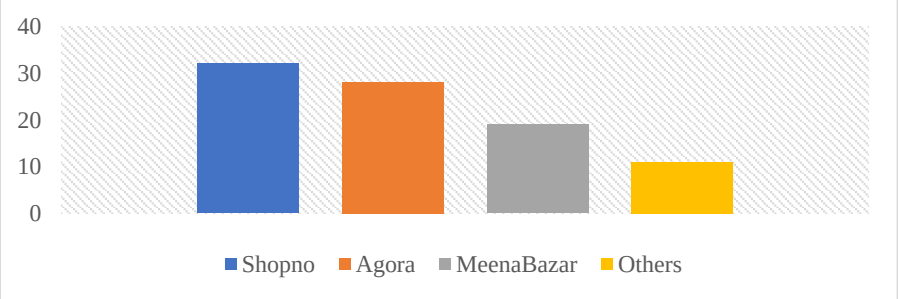


Figure 1: Frequency distribution of outlets

Figure 1's distribution illustrates the variety of superstore chains that took part in the research, with a greater presence of the bigger, more well-known chains like Shopno and Agora. A thorough examination of GSCM procedures at various operational scales is made possible by this release. While independent and smaller stores in the 'Others' category may have distinct chances and obstacles in implementing GSCM, larger chains such as Shopno and Agora, with their vast network of outlets, may have greater resources and established programs to do so. To effectively create methods and recommendations for GSCM implementation that may meet the needs of Dhaka's retail operations, whether large and small, it is important to understand these variances. The data visualization emphasizes how important it is to take market presence and store size into account when interpreting and extrapolating conclusions on eco-friendly retailing practices. The fact that Shopno and Agora have more stores than other categories could be a sign of their market dominance and/or a stronger influence on environmental sustainability in the retail industry. Conversely, the 'Others' category provides valuable insights into the diverse problems and strategies employed by smaller entities. This ensures that the study encompasses a broad range of approaches to green supply chain management within the retail business.

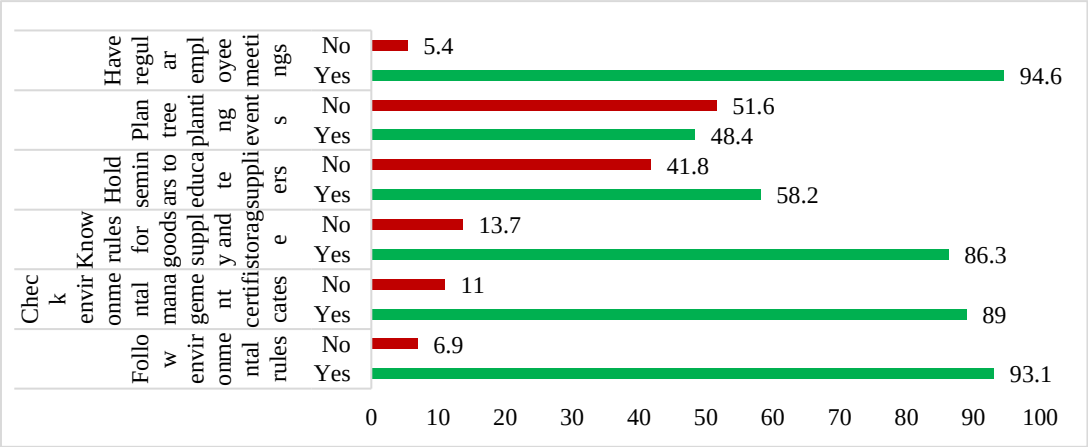


Figure 2: Frequency distribution of respondent responses

A graphic depiction of respondents' reactions to different environmental management techniques and organizational awareness is shown in Figure 2. Among the most striking findings is the high percentage of respondents (93.1%) indicating adherence to environmental regulations, highlighting the company's success in implementing policies to ensure compliance with environmental laws. This also reflects a strong commitment from staff members to support the organization's sustainability initiatives. Most respondents (86.3%) claimed to be aware of environmental management regulations, though only 58.2% reported holding regular staff meetings. This suggests a potential gap in formal training and communication, as understanding the basics of environmental laws is insufficient without consistent reinforcement through training sessions. Regular meetings could enhance best practice adoption, address specific challenges, and foster a deeper understanding of sustainability goals. Such gatherings can also cultivate a culture of environmental awareness and empower employees to take initiative in sustainability efforts. A significant majority of respondents (94.6%) stated that their company organizes seminars to train suppliers on environmental best practices, reflecting a proactive approach to supply chain sustainability. This indicates the organization's recognition of the importance of aligning supplier practices with its environmental objectives. Meanwhile, 48.4% of respondents reported participating in tree-planting events, showcasing the organization's dedication to community involvement and environmental preservation. However, it is essential to evaluate whether these activities align with broader sustainability objectives and explore opportunities for expansion. To enhance training and communication, the organization could implement interactive training programs, hold regular staff meetings, and integrate technology-based solutions. A comprehensive environmental management plan, greater community project participation, and the promotion of sustainable practices among employees can further strengthen the organization's commitment to sustainability. Additionally, supply chain engagement can be improved by conducting regular audits, offering incentives, and fostering collaboration to ensure supplier compliance with environmental regulations and alignment with sustainability goals.

Table 1 presents a correlation matrix examining the relationships between six environmental management variables within an organization: V1 (Follow environmental rules), V2 (Check environmental management certificates), V3 (Know rules for goods supply and storage), V4 (Hold seminars to educate suppliers), V5 (Plan tree planting events), and V6 (Have regular employee meetings). Correlation coefficients range from -0.19 to 0.36,

indicating varying degrees of positive and negative relationships. A positive correlation suggests that as one variable increases, the other tends to do the same, while a negative correlation implies the opposite. Notably, there is a robust positive association between V5 and V4, indicating that organizations prioritizing supplier education on environmental issues also show higher participation in tree-planting events. This points to a broader commitment to sustainability, focusing on both internal and external efforts. Additionally, the somewhat positive association between V5 and V3 suggests that organizations with a solid understanding of supply and storage environmental management are more likely to engage in tree-planting activities, emphasizing the importance of comprehensive management. While V1 and V2 do not significantly correlate, both are essential for effective environmental management, as organizations may adhere to regulations without verifying certificates or vice versa. A robust system would incorporate both practices. V6's low correlations with other variables suggest that while regular staff meetings could promote environmental awareness, they might not be strongly linked to other practices. This highlights the potential for staff meetings to better align with broader environmental initiatives through targeted improvements.

Table 1: Correlation matrix

	V1	V2	V3	V4	V5	V6
V1	1					
V2	-.09	1				
V3	.06	.19	1			
V4	.08	-.05	.07	1		
V5	-.06	-.19	.12	.36**	1	
V6	-.06	-.08	.08	-.05	-.05	1

** Correlation is significant at the 0.01 level

The government can play a pivotal role in promoting environmentally responsible retail in Dhaka, Bangladesh, through comprehensive policies and programs. Tax incentives and subsidies can alleviate the financial burden of green initiatives, encouraging superstores to adopt sustainable practices. Strict environmental regulations, including mandatory standards and labeling systems, can ensure compliance. Public campaigns and integrating environmental education into school curricula can raise consumer awareness. Strong supplier partnerships, supported by certification requirements and collaborative efforts, can foster sustainable supply chains and reduce product-related environmental impacts. Investment in infrastructure, such as waste management facilities and public transportation, can create a supportive environment for eco-friendly retailing. Additionally, funding for research and development and policy coordination can drive the growth and adoption of sustainable practices. These measures can establish a sustainable retail landscape in Dhaka, enhancing the city’s environmental health and residents’ well-being.

5. Conclusion

This study provides insightful information about how green practices are currently being implemented in Dhaka's retail industry. The results reveal how superstores are becoming more conscious of and committed to eco-friendly activities due to a variety of causes, including consumer demand, regulatory pressures, and corporate social responsibility. The study's originality comes from its emphasis on the circumstances of Dhaka, Bangladesh, where fast economic expansion and urbanization have created serious environmental problems. This study's importance goes beyond the immediate area; it offers insightful guidance to other developing cities dealing with comparable environmental challenges. The results underscore the significance of governmental regulations, consumer consciousness, and supplier alliances in endorsing environmentally conscious commerce. The study has various drawbacks even though it offers a thorough grasp of the green supply chain management techniques used in Dhaka's superstores. The study largely examines large-scale superstores; additional research is required to examine how smaller merchants and traditional markets are implementing green practices. Further studies could explore the social and economic advantages of eco-friendly shopping in Dhaka, such as enhanced public health, energy savings, and employment generation. It would also be beneficial to look into how sustainable green practices are over the long run in light of shifting market dynamics and financial circumstances. Future studies can advance our understanding of the function of environmentally friendly shopping in sustainable urban development by tackling these issues.

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