

A Study on the Impact of Green Supply Chain Management on Financial and Environmental Outcomes in Restaurants

Prasun Das Gupta¹, Puja Rani Bormon¹, Prionti Dey¹, Tasnim Mahadi¹, Tazrin Rashid Pritha²

¹Jagannath University, ²Bangladesh University of Professionals

Abstract:

The aim of the investigation is to explore the link between Green Supply Chain Management (GSCM) and both monetary performance of eateries. The manufacturing sector has been widely explored in the context of Enter display a brief of the three kinds of tasseled toward the end of this section. GSCM has been rarely explored. The restaurant sector is represented by numerous key tests; one of the most prominent among them is the huge measure of food squander, energy utilization, and direct interest for sustainable practices from the clients. Consideration of GSCM prerequisites into the thinking of the purchaser has minimal consideration. The survey data were taken for 100 eateries which are picked arbitrarily, were utilized as a fundamental data assortment technique for this examination. Information analysis and informal survey strategy are utilized to date. The significant examination is Multiple Regression. The study interfaces the information from different eateries with the variables for both the conditions for monetary performance and the variables for natural performance.

Keywords: Green Supply Chain Management, Environmental Performance, Financial Performance, Restaurant Industry, Sustainability

Introduction:

Data reliance in current industries is extremely high for supply chains. According to research, to maximize productivity, reduce risks, and increase overall sustainability, an effective supply chain should feature reliable forecasting and decision-making based on data. (Year, Author(s)). There is a paradigm shift within the world hospitality sector as sustainability of the environment gains more popularity among consumers, business organizations, and governments. With energy consumption at a high level, extensive utilization of natural resources, and contribution to food wastage and packaging pollution, the restaurant industry is perhaps one of the most important sectors of the hospitality sector (FAO, 2013). Initiation of Green Supply Chain Management (GSCM) strategies has become a strategic approach towards environmental as well as financial goals in resolving these issues. GSCM incorporates environmental factors into supply chain functions such as waste management, transportation, purchasing, and end-of-life product disposal (Zhu & Sarkis, 2004). In addition to operational effectiveness, GSCM in restaurants is important. Consumers nowadays are prepared to pay more for eco-friendly eating experiences and place more value on companies that are doing their part to care for the environment (Han et al., 2011). By implementing

environmentally friendly strategies like the use of locally grown organic ingredients, minimizing food and energy wastage, and using eco-friendly packaging, restaurants can take advantage of this movement in consumer demand and become competitive (Wang et al., 2013). According to Zhu, Sarkis, and Lai (2012), restaurants that successfully employ GSCM are able to lower operating expenses, increase the customer happiness index, and improve their overall bottom line. "The supply chain is a complex system which goes through several steps, such as manufacturing, production, distribution, etc., before converting raw material into finished product or service. It is highly prone to disturbances and environmental fluctuations." (Paul Nahin, Mostan, and Dhar, 2024.) Customer loyalty and satisfaction are being more and more associated with efficient and sustainable operations in the restaurant industry. According to past research, supply chain management is important to improve customer retention and satisfaction since it leads to effectiveness, responsiveness, and dependability (Author(s), Year).

Although GSCM has been extensively explored in manufacturing and industrial settings (Zhu & Sarkis, 2007; Sarkis, 2011), its adoption in the restaurant sector is still not well explored. Given how customer-driven the restaurant business is and how ready it is to influence sustainable purchasing habits and environmental awareness, this represents a very significant study gap. Few empirical works exist that specifically investigate the impact of GSCM on restaurant financial performance (FP) and environmental performance (EP) when, as existing literature has implied, green initiatives improve environmental performance (DiPietro, Gregory, & Jackson, 2013). Moreover, there has been a lack of research on the possible connection between financial and environmental performance in this industry.

Inciting the imperative for this research, this paper suggests a conceptual model connecting FP, EP, and GSCM to address this gap.

This study conjectures that GSCM positively impacts environmental performance (H2) and subsequently financial performance (H1). In addition, it holds that financial performance has a positive effect on environmental performance (H3), and thus a virtuous circle exists between profitability and sustainability. This is in line with the increasing awareness that green business also spells long-term company success.

Three goals are under study in this research:

to examine how GSCM practices influence the financial performance of restaurants.

to evaluate how GSCM impacts environmental performance in the restaurant sector.

to examine the interconnection of environmental and financial prosperity.

The study adds to sustainability literature in the service sector through its case of restaurants and offer empirical confirmation of how green supply chain practices may enhance financial and environmental performance at the same time. Findings indicate the double advantage of GSCM in promoting competitiveness and promoting environmental stewardship and, therefore, are valuable to researchers, policymakers, and restaurant managers.

Literature review:

Sustainability has been a key concern for many industries over the last few years, especially restaurants and hospitality. Globalization, greater awareness of the environmental problem, and more stringent regulations have pushed organizations towards sustainability. Green Supply Chain Management (GSCM) practices not only enhance sustainability but also lead to improved financial performance and competitiveness in the industry," stressed Hasan Fahim, Hossen, (Sakib, Shakil, and Haque 2024). One of the extensively studied approaches is Green Supply Chain Management (GSCM), which embeds environmental concerns into operations like procurement, manufacturing, distribution, and waste disposal (Sarkis, 2003). The supply chain is a sophisticated system that passes through different phases such as production, manufacturing, and distribution, and so on, before the raw material is transformed into a product or service. The supply chain is very prone to disruptions and variability in the environment." (Paul Nahin, Mostan, and Dhar, 2024.) Even though the majority of the GSCM literature has focused on manufacturing, its application in the restaurant industry is gaining interest since it has unique features such as high consumption of resources, high food waste generation, and direct customer contact with environmentally conscious customers. This study examines the impact of GSCM on environmental performance (EP) and financial performance (FP) of restaurants. The majority of research on sustainable supply chain strategies, particularly those conducted in Bangladesh, has mostly ignored the financial and economic aspects in favor of concentrating on how they affect environmental performance (Helal et al., 2024). It also considers the connection between FP and EP, with the purpose of raising understanding of sustainable outcomes in the restaurant business. According to Mahmud, Rouf, and Mahin (2024). Inefficiencies in the supply chain, from production to distribution, often result in significant post-harvest losses and lower profitability for farmers" (p. 3).

Supply Chain Insider

Volume 17, Issue 01, 1-8. 10-10-25 ISSN: 2617-7420 (Print), 2617-7420 (Online)

supplychaininsider.org | 2 | Page

Restaurants Using Green Supply Chain Management

GSCM involves considering environmental factors at various points, from product design to sourcing, procurement, manufacturing, distribution, and end-of-life management (Zhu & Sarkis, 2004). For restaurants, it means operations like buying locally produced, organic, and sustainable produce, or "green purchasing." It further includes environmentally friendly operations that focus on recycling, energy and water conservation, and waste minimization. Sustainable logistics mean locally sourced transportation to reduce transportation footprint. Employing biodegradable or reusable packaging is "green packaging." Studies indicate that GSCM not only minimizes adverse environmental impacts but also allows organizations to achieve competitive advantage (Walker et al., 2008). Implementing environmentally friendly practices in the restaurant business can enhance customer satisfaction, reduce waste-related costs, and enhance operational efficiency, both positively affecting financial outcomes and the environment.

GSCM and Financial Performance (H1)

The first hypothesis is that GSCM positively affects FP. Present research strongly justifies this assumption. Research suggests that adopting green practices saves operational expenses by reducing energy and water consumption and waste disposal costs (Porter & van der Linde, 1995). For instance, restaurants can greatly minimize expenses by using water-saving appliances, waste monitoring equipment, and energy-efficient cooking devices. Customer behavior is a primary driver; contemporary customers are more environmentally aware and prefer to dine at restaurants that are focused on sustainability (Han et al., 2011). Restaurants can establish their reputation, attract environmentally conscious customers, and even price green menu choices differently in order to benefit from GSCM. Such "green differentiation" enhances sales and loyalty.

Compliance as well as risk mitigation also generates cost savings. Internationally, regulations for food wastage disposal, carbon output, and single-use plastics are being tightened. Restaurants that embrace GSCM in advance will be rewarded with government incentives and tax relief as well as being exempt from penalties. Moreover, most stakeholders and investors also like companies that have sustainable environmental practices, which enhances long-term financial performance (Zailani et al., 2012). Hence, there is ample support that GSCM enhances financial performance through cost reduction, efficiency, enhanced brand reputation, and compliance with regulations.

Environmental Performance and GSCM (H2)

The second hypothesis reflects that GSCM positively impacts environmental performance (EP). The goal of GSCM practices is to support sustainability performance and alleviate environmental pressure. Restaurants are a major contributor to food wastage, excessive water usage, and greenhouse gases (FAO, 2013). They address these challenges with GSCM by reducing waste by efficient inventory and portion control and recycling and composting to continue to limit landfill inputs. They conserve water and energy by utilizing water-conserving fixtures and energy-efficient products. Procuring locally from local agriculture and organic farming promotes biodiversity with fewer transport emissions. Environmentally friendly delivery and biodegradable packaging reduce carbon footprints. Research has shown that firms using GSCM have favorable environmental performance, such as reduced emissions, lower energy usage, and reduced waste (Zhu et al., 2008). In restaurants, these benefits accrue to the environment as well as the reputation of the restaurant as a socially responsible business.

Finally, GSCM practice improves environmental performance through lowering environmental harm and promoting resource use efficiency.

Performance of the Environment and Finances (H3)

The third hypothesis is one in which financial performance positively influences environmental performance. This is two-pronged. First, profitable operations provide companies with the resources with which they can invest in environmentally friendly technologies and sustainable technologies. The sustainability literature has long explored this "virtuous cycle" and established a strong correlation between financial and environmental outcomes (Orlitzky et al., 2003).

Supply Chain Insider

Volume 17, Issue 01, 1-8. 10-10-25 ISSN: 2617-7420 (Print), 2617-7420 (Online)

supplychaininsider.org | 3 | Page

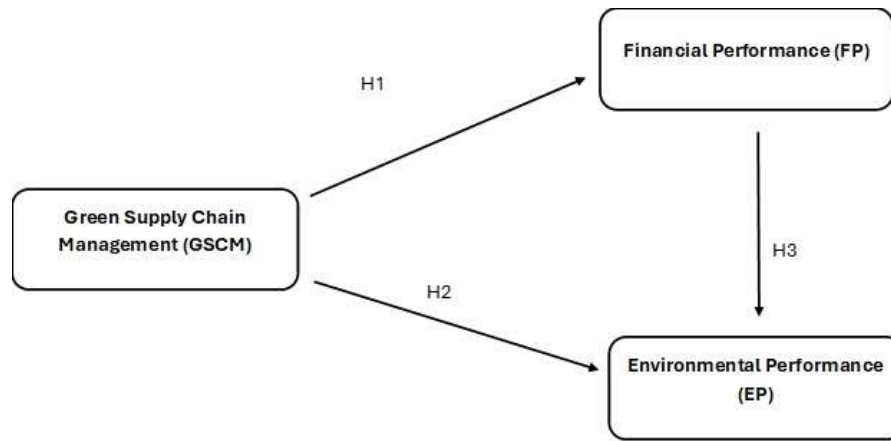
While good cost performance enables environmental improvements to become feasible, good environmental performance can also lead to positive financial performance, especially in customer industries like restaurants. Successful restaurants can afford to spend money on green employee education, sustainable building materials, and solar or wind power systems. These types of investments can require major outlays of resources, which well-funded companies can more readily absorb (Hart & Ahuja, 1996). Second, there is a reinforcement cycle that can be created when better environmental performance also means better financial performance. Restaurants with terrific environmental practices, for instance, can attract more customers, earn more revenues, and provide further investments in sustainability.

Relevance to the Restaurant Industry

While copious amounts of research have been conducted in manufacturing, applying GSCM to restaurants is relatively recent. Restaurants offer unique challenges by direct customer interaction, high levels of waste generation, and perishable inputs. They also possess great chances to improve sustainability by adopting waste management schemes, green menus, and local purchasing. Hospitality management studies conducted in the past indicate that restaurant customers are more and more choosing restaurants that reflect environmental responsibility (Kang et al., 2012). Thus, GSCM can help establish a competitive advantage as well as an economical means of reducing costs in the restaurant business. Furthermore, restaurants are central to achieving Sustainable Development Goals (SDGs) amid pressing global issues like climate change and food waste reduction.

By presenting empirical data from the restaurant environment, this study design combines GSCM, FP, and EP, thus closing a gap in existing research. The research concludes that Green Supply Chain Management (GSCM) significantly contributes to the economic and environmental performance of restaurants. GSCM enhances bottom lines through cost reduction, reputation enhancement, and better compliance with regulations. At the same time, it enhances environmental performance through reduced waste, improved resource efficiency, and lower carbon footprint. Further, financial and environmental performances have a connection: profitability facilitates investment in sustainability, while environment activities build long-term financial resilience.

In brief, the presumed assumptions (H1, H2, and H3) are adequately proven by past studies. However, there is a lack of empirical studies that focus on restaurants. Accordingly, this study aims to bridge the gap by exploring how GSCM influences FP and EP in the restaurant environment.



H1: GSCM positively influences FP

H2: GSCM positively influences EP

H3: FP positively influences EP

Methodology:

Design of Research

The impact of financial performance (FP) and environmental performance (EP) on the implementation of green supply chain management (GSCM) practices by restaurants is empirically analyzed in this study using a quantitative design. Since the main goal of the study is to apply quantifiable and statistically proven data to create cause-and-effect relationships between independent and dependent variables, the quantitative approach was chosen.

Data Gathering and Sample

One hundred restaurants participated in a standardized survey that was used to gather data. Restaurants were sampled by purposive sampling for the purpose of representing a variety of operating sizes and practices. To increase response validity and lower social desirability bias, the survey promised confidentiality.

Measurement and Variables

Three main constructs are emphasized in this study:

Dependent variable (DV), GSCM, or green supply chain management.

operationalized in terms of the extent to which a restaurant has embraced green supply chain processes.

Adopted (1) vs. Not Adopted (0) is a dichotomous variable.

Financial Performance (FP) is the first independent variable (IV1).

accounts for how financially healthy the restaurant is in terms of revenue growth, cost reduction, and profitability.

Categorical scales (Low = 1, Medium = 2, High = 3) were used to measure the responses.

Environmental Performance (EP) is the second independent variable (IV2).

accounts for how much effort the restaurant puts into being more environmentally friendly, minimizing waste, and using less energy.

Similarly, responses were also grouped into three: Low (1), Medium (2), and High (3).

To enable statistical analysis on Microsoft Excel, all responses were coded into figures.

Method of Data Analysis

With the support of Microsoft Excel Data Analysis ToolPak, multiple regression analysis was done to examine the dataset. Because it enables the testing of the direct influences of more than one independent variable on a dependent variable simultaneously, regression was selected. In particular, the following regression model was applied in this study:

$$\beta_0 + \beta_1(\text{FP}) + \beta_2(\text{EP}) + \epsilon = \text{GSCM}$$

Where:

ϵ is the error term, β_0 is the intercept, and β_1 and β_2 are the regression coefficients of FP and EP, respectively.

$R^2 = 0.523 \rightarrow$ model fairly strong (52.3% variance explain GSCM adoption) |

ANOVA F-test significant ($p < 0.001$) $\rightarrow$ overall regression model significant |

FP ($p = 0.839 > 0.05$) $\rightarrow$ Financial performance effect not significant |

EP ($p < 0.001$) $\rightarrow$ Environmental performance effect positive and significant |

According to R-squared (R^2) values, depicting variance in GSCM explained by FP and EP, model strength was tested. Overall model significance was tested based on ANOVA F-statistics, while t-tests and p-values were utilized to test the individual contribution of each independent variable.

Regression analysis was especially appropriate for this study environment because:

Despite the fact that the dependent variable is categorical (adopted or not adopted), there is a possibility to code it as dichotomous outcome with adequate coding.

In comparisons of relative strength of the various predictors (FP and EP), they are considered together.

In hypothesis testing, regression gives direction (positive or negative) and magnitude (beta coefficients) of the correlations.

Multiple regression was deemed appropriate as the IVs were on ordinal scales (1–3) and a test of the linear impact of performance measures on GSCM adoption was intended, albeit logistic regression is suitable for binary outcomes as well.

Validity and Reliability Checks

For model stability, relevant regression assumptions were verified:

Linearity: For the purpose of testing a linear association between the predictors and the dependent variable, scatterplots were examined.

Multicollinearity: In order to make sure that FP and EP were not very collinear, their correlation was verified.

Homoscedasticity: To verify equal variance of errors, residual plots were verified.

Normality: To verify approximate normality, the distribution of residuals was verified.

Fitness of the data for regression analysis was ensured by all the above checks.

Moral Aspects to Consider

By maintaining confidentiality, anonymity, and voluntary response, the study followed research ethics. Restaurants were not explicitly identified, and the data were used only for scholarly research.

Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8	Column9
SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.723526777							
R Square	0.523490996							
Adjusted R Square	0.513666068							
Standard Error	0.290340974							
Observations	100							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	2	8.983105498	4.491552749	53.2819173	2.4347E-16			
Residual	97	8.176894502	0.084297881					
Total	99	17.16						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.692347697	0.276859078	-2.5007224	0.01407033	-1.2418363	-0.1428591	-1.2418363	-0.1428591
IV1(FP)	-0.01820208	0.089359533	-0.203694889	0.83901866	-0.195556	0.15915186	-0.195556	0.15915186
IV2(EP)	0.838930163	0.081323818	10.31592201	2.7908E-17	0.6775249	1.00033543	0.6775249	1.00033543

Conclusion:

The literature examined is concerned with the way Green Supply Chain Management (GSCM) is becoming increasingly important in developing the restaurant industry's sustainability goal. Supply chain systems, regardless of their natural complexity and vulnerability to disruption, can greatly enhance the operational resilience and sustainability performance by incorporating green strategies like eco-friendly packaging, waste minimization, energy efficiency, and sustainable purchasing. GSCM improves environmental performance by being resource-efficient and reducing waste and also positively affects finance by conserving costs, improving the brand's reputation, and gaining environmentally oriented customers. Moreover, findings show that there is a virtuous cycle between environmental and financial performance. Environmental performance to a greater extent translates into increased long-term profitability and customer trust, while good financial performance equips restaurants with funds to invest in green technology. Nevertheless, the majority of empirical research has been on the manufacturing industry, with relatively limited data from the restaurant sector. This gap offers a primary study opportunity owing to the restaurant industry's high resource consumption and intimate customer contact. By conducting an empirical test of the designed framework that relates GSCM to restaurant financial and environmental performance, this study seeks to close this gap. By doing so, it adds to academic knowledge of GSCM in the service industry and to useful advice for restaurant managers and legislators trying to make sustainability work along with profitability. This adds to theory and practice. Finally, what the result should be is that engaging in green supply chain practices not only becomes a necessity for the environment but also a question of strategy for the long-term viability and competitiveness of the restaurant industry.

References:

1. Supply Chain Insider Optimization of rice supply chain through multivariate forecasting using ensemble learning models(Bin Mahmud et al., 2024)
2. Supply Chain Insider THE ROLE OF LOGISTICS IN DRIVING CUSTOMER SATISFACTION: AN EMPIRICAL INVESTIGATION IN BANGLADESH(Ahmed et al., 2024)
3. Supply Chain Insider Do Sustainable Supply Chain Practices Really Matter to the Environment? An Empirical Investigation in the Context of Bangladesh(Helal et al., 2024)
4. Supply Chain Insider The Influence of Key Supply Chain Factors on Customer Retention Among Facebook-Based Homemade Food Businesses Supply Chain Insider(Org P A G E, Tanvir, et al., 2024)
5. Supply Chain Insider Supply Chain Insider Transforming Bangladesh's Traditional Textile and Apparel Industry: A Sustainable Future with Green Supply Chain Management Supply Chain Insider(Fahad Hasan Fahim et al., 2024)
6. Supply Chain Insider Assessment of External Vulnerability of Rice Supply Chain Using FMEA, Bishwanath Upazila, Sylhet, Bangladesh(Org P A G E, Nahin, et al., 2024)
7. The Impact of Green Supply Chain Management Practices on Organizational Performance: A Study of Jordanian Food Industries(Diab et al., 2015)
8. Examining the effects of green supply chain management practices and their mediations on performance improvements(Zhu et al., 2012)
9. Effects of Individual and Institutional Factors for Sustainable Chains and Production(Yıldırım Özmutlu & Arun, 2025)
10. What Drives Green Restaurant Patronage Intention?(Tan & Yeap, 2012)