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## Impact of Green Supply Chain Management on Socio-Economic Performances Through Business Students Awareness

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### Abstract

*The purpose of this research is to gain insight into the impact of green supply chain management (GSCM) practices on the ability of students at Can Tho to sustainably maintain their performance levels in business projects. Data was collected from a sample of 393 students who are presently enrolled in either business administration or international business degree programs, using a standardized questionnaire. In order to participate in the survey, exclusive invitations were sent just to persons with significant knowledge and experience in the field of supply chain and logistics. The major aim of this research was to assess the performance of firms in relation to their ability to maintain both economic and social sustainability. The study examined five aspects of GSCM, including environmental education, internal environmental management, green procurement, green manufacturing, and green distribution, in order to assess their impact. The study's results indicate that the effects of GSCM exhibited variations across the measures used to assess economic and social achievements. The implementation of green buying methods had positive effects on both aspects, although green manufacturing and internal management initiatives mostly contributed to the social dimension of the equation. This research adds to the existing body of information about the components of GSCM that pertain to sustainability. This research piece undertakes a comprehensive analysis and evaluation of several dimensions of sustainability. The discussion encompasses GSCM as well as several economic and social problems. The researchers suggest that the integration of GSCM training into college curriculum is crucial due to its significant impact on students' prospective achievements within their respective professions and broader societal contexts. Individuals who choose to engage in their personal development by pursuing a business degree are more likely to achieve success as entrepreneurs, enabling them to enhance their ventures and make significant contributions to economic growth. The inclusion of subjects such as corporate social responsibility, community service, and ecologically sustainable production in school curricula is vital for safeguarding the welfare of companies, communities, and the environment. Additional subjects that need to be included in the curriculum are environmental stewardship and ethical corporate practices.*

**Keywords:** Business student, green supply chain management, awareness.

### 1. Introduction

The acceleration of global warming may be attributed to the significant impact of expanding industrialization worldwide, which has resulted in resource depletion and heightened greenhouse gas (GHG) emissions (Ait Sidhoum & Serra, 2018). According to the findings of the International

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Energy Agency (IEA), it has been shown that the industrial sector has a substantial role in the phenomenon of global warming. Projections for the year 2019 indicate that industrial emissions are estimated to account for around 25% of the overall greenhouse gas emissions. Approximately 70% of the energy used by the global industrial sector, including roughly 40% of the total energy consumption, is derived from fossil fuel sources. The Sustainable Building and Climate Initiative of the United Nations Environment Programme (2021) asserts that the construction sector has a significant role in the global problem at hand. This phenomenon potentially contributes to around one-third of global carbon emissions, forty percent of global waste generation, thirty percent of global resource use, and twenty-five percent of global water utilization. Green supply chain management techniques may be classified into two main categories: internal and external, based on the level of urbanization in a given location. The issue of global climate change, which is subject to intense debate and poses substantial challenges to society, is already exerting a notable impact on the business domain. Moreover, it is expected that this effect will become increasingly pronounced with time. In December 2015, a significant number of countries, close to two hundred, affixed their signatures to "The Paris Accord" in order to confront this urgent issue. Business operations commenced in November 2016. The primary objective of the Paris Agreement is to limit the increase in global average temperature to less than 2 Celsius degrees relative to pre-industrial levels. It is advisable for leaders on a worldwide scale to strive towards the achievement of zero emissions via the complete elimination of fossil fuels. Although the industry has had a significant role in exacerbating climate change, it is noteworthy that the corporate sector has shown its support for the Paris Climate Agreement. At the 22nd Conference of the Parties (COP22), a total of over three hundred and fifty firms reiterated their commitment to the Agreement. Many corporations are considering the reduction of their carbon dioxide (CO<sub>2</sub>) emissions as a means to achieve cost savings and adhere to international agreements. Supporters of carbon strategies within the corporate sector may possess a competitive advantage over their rivals. Business enterprises have the potential to enhance their competitive advantage by actively addressing the challenges posed by climate change and capitalizing on the opportunities that arise as a result. In light of the aforementioned obstacles, it is essential for organizations and individuals responsible for making decisions in this particular domain to actively seek guidance and assistance from experts (Carola et al., 2013). When formulating a sustainable supply chain, it is essential to consider economic, environmental, and social factors in a comprehensive manner. The adoption of business strategies that include concepts and resources with the objective of achieving sustainable development is increasingly being recognized and embraced by scholars and professionals in the field (Blanka, 2020).

The environment has a multitude of qualities that have an impact on living organisms, as previously expounded upon. The challenges posed by these aspects are garnering a growing level of scrutiny. In order to proficiently address the escalating social and environmental concerns while concurrently preserving the environment, corporations must integrate strategies and protocols into their routine operations. Otherwise, individuals will be unable to do either task. Furthermore, while the concept of green supply chain management has garnered significant support and recognition in many industrialized economies, it has not yet been fully adopted in other regions. This is in spite of the fact that it has received substantial support and recognition in those nations. According to Green et al. (2012), the reason for this might perhaps be attributed to a limited understanding of the environmental and economic benefits that are linked to such activities. The topic of environmentally friendly supply chain management is extensively examined and analyzed by professionals in the field, as well as scholars doing academic studies in this area. According to Jia et al. (2018) and Pakdeechoho & Sukhotu (2018),

the topic under consideration encompasses several factors, including societal pressures related to reputation and corporate image, concerns over pollution, governmental regulations, stakeholder expectations, evolving consumer wants, and the depletion of natural resources.

The notion of sustainable development has lately surfaced as a prominent subject of discourse within the global business sector. The implementation of Green Supply Chain Management (GSCM) in urban zones faces several challenges as a result of the increasing urban population. GSCM encompasses a comprehensive range of strategies and practices that address environmental concerns within both internal and external dimensions of supply chain operations. External practices include collaborative efforts with suppliers, customers, and other stakeholders to mitigate the environmental impact of the supply chain, whereas internal practices focus on improving the company's own environmental performance. J. Wang & Dai (2018) asserted that GSCM is an effective tool for achieving sustainability goals and enhancing environmental and social accountability. The objective of GSCM is to enhance the overall performance of an organization and its supply chain partners by effectively coordinating crucial inter-organizational business processes in order to attain economic and social objectives (Ageron et al., 2012). The implementation of GSCM has the potential to significantly mitigate the adverse environmental impacts resulting from industrial operations, while concurrently enhancing operational efficiency. Various challenges, such as the degradation of the environment, limited availability of natural resources, and escalating levels of pollution, have compelled enterprises to embrace the practice of GSCM. Given the growing prominence of GSCM and its adoption by major corporations, it is imperative to examine the potential implications for smaller enterprises. The inclusion and engagement of small enterprises in environmental conservation are of paramount importance in promoting motivation and facilitating the progression towards a more sustainable approach. The concept of GSCM has been extensively deliberated and examined by several entities, including the United States, the European Union, and Japan, among other stakeholders. In order to obtain and maintain a competitive advantage in the market, businesses should prioritize the integration of environmental sustainability within their supply chains. According to a study conducted by Diab et al. (2015), the effective implementation of green supply chain management principles by a business necessitates the prior establishment of internal green supply chain management practices. Cankaya & Sezen (2018) claimed that the implementation of green supply chain management may provide positive outcomes for a company's operational efficiency, customer satisfaction, and overall reputation. According to Ait Sidhoum & Serra (2018), the level of dedication a firm demonstrates toward green supply chain management may serve as an indicator of its operational and financial well-being, as well as its aspiration to attain social advancement. In their study, Masoumi et al. (2019) found no significant correlation between the level of research conducted and the effectiveness of sustainable/green supply chains or enhancements in environmental performance.

The main objective of the research was to investigate the relationship between GSCM practices and the sustainability performance (economic and social performances) of business students in Can Tho City, Vietnam. Before developing the questionnaire, the dimensions of GSCM practices were considered. As a result, five dimensions were analyzed: internal environmental management, green procurement, green manufacturing, green distribution, and environmental education.

## **2. Methodology**

### **2.1 Sampling technique**

The study collected data from 393 respondents who were business students in Business Administration and International Business. The study used a structured questionnaire to collect

data from respondents who had in-depth knowledge and involvement in the execution and strategy formulation regarding issues related to supply chain and logistics. All selected students had experienced courses such as supply chain management, global procurement, logistics, and Omni channels. The study used purposive sampling to select respondents. Walk-in follow-ups were made to classes to collect data by QR code over 10 weeks (from November 01, 2022, to January 15, 2023). After 10 weeks of data collection, 393 questionnaires were retrieved representing an 85% response rate. The questionnaire consisted of two main sections and a section on control variables. The control variables were gender, age, and educational level, which were measured as categorical variables. The two main sections used a five-point Likert scale (1= strongly disagree, 5= strongly agree) to measure the respondents' opinions. The first section had 33 items that assessed GSCM based on the dimensions of internal environmental management (four items), green procurement (five items), green manufacturing (four items), green distribution (five items), and environmental education (three items). These dimensions were adapted from previous studies (Xie & Breen, 2012; Ghobakhloo et al., 2013; Dadhich et al., 2015; Bu et al., 2020). The second section measured sustainability performance in terms of economic (seven items) and social (six items) outcomes.

## **2.2 Literature Review**

### **2.2.1 Green supply chain management**

Based on the existing body of research, the adoption of environmentally conscious supply chain management strategies has the capacity to augment the environmental sustainability of a firm. The study conducted by Pratiwa & Widodob (2019) used a cross-sectional technique to investigate the impact of Green Supply Chain Management (GSCM) practices on the long-term profitability of firms. In order to conduct their research, Ikegwuru & Pokubo (2018) collected data from many gas stations situated in Rivers State, Nigeria. Their main focus is on generating evidence that links environmentally responsible management solutions for supply chains to improved ecological and financial outcomes. Throughout the duration of the investigation, a diverse range of statistical methodologies were used, including assessments of reliability and validity, correlational analysis, and further techniques. The study results presented substantiated the working hypothesis positing a correlation between environmental performance and social sustainability, as well as the interconnectedness of economic sustainability with environmental sustainability. In their study, Sungchul & Alex (2011) conducted an investigation into the correlation between pricing and the economic and environmental aspects associated with sustainability. Additionally, they examined the following impact of these factors on consumer behavior, using an experimental technique. Based on the study results, it can be seen that consumers have a tendency to favor businesses that demonstrate a commitment to environmental sustainability, as shown by their favorable opinions of the company and their inclination to engage in purchasing activities with such organizations. Customers exhibit a higher degree of scrutiny towards the company's deficient dedication to environmental preservation compared to its deficient dedication to long-term financial viability. Customers exhibit a heightened level of worry over the company's ability to effectively protect and preserve the natural environment. Based on the research results, it can be seen that customers exhibit a negative response toward a reduced price point when they possess knowledge about a company's lack of commitment to stringent environmental sustainability standards. Based on the results obtained from the research, there exists a clear correlation between consumers' endorsement of environmentally responsible company

practices and the longevity of their favored companies. The implementation of GSCM involves the use of a diverse range of strategies, with some techniques being employed internally inside the firm, and others being applied externally (Shaheen, 2022). The adoption of green practices encompasses a range of components, including sustainable sourcing, ecologically responsible operations (Muzammil, 2022), efficient reverse logistics (Asif, 2022), and environmentally friendly retailing (Alam, 2022). A plethora of research has shown that firms possess the capacity to improve their performance via the use of environmentally sustainable supply chain practices. (Uddin, 2022) conducted an investigation into the existing body of research on several sustainable consumption strategies, revealing that the scholars involved in these studies had differing perspectives about the efficacy of these methods.

The research done by Green et al. (2012) shows that organizations using green supply chain methods have enhancements in their operational efficiency, cost reductions, and environmental footprint. It is essential to bear in mind, nevertheless, that not all alternatives possess equivalent levels of efficacy. According to Anwar (2022), the adoption of economically viable solutions may have the unintended consequence of undermining the positive outcomes associated with ecologically responsible practices. Contrarily, Ayaz (2022) argued that preemptive measures do not have any influence on the eventual result of the problem. As a result of this, enterprises must take into account both the internal and external aspects of their premises when considering the adoption of eco-friendly measures. Amjad (2022) posited that external influences include a range of possibilities and limitations that are interconnected with the economic and political landscape. The internal characteristics include factors such as a feeling of obligation and intrinsic drive. Hunaid et al. (2022) suggested that organizations might potentially derive advantages by engaging in collaborative efforts with supply chain partners that demonstrate a shared dedication to environmental responsibility. This technique has the capacity to enhance existing environmental sustainability measures inside supply chain activities, hence aiding firms in attaining enhanced outcomes.

According to Cankaya & Sezen (2018), environmental education plays a crucial role in facilitating human development and ensuring equitable opportunities for all persons to contribute to the establishment of a sustainable society. This concept has garnered significant acceptance within scholarly circles and is substantiated by several authoritative sources. The significance of environmentally responsible company operations has been shown by the outcomes of current quantitative research. The productivity of environmental education is contingent upon its ability to achieve two key objectives. At the start, it is essential that every staff member of the organization get a comprehensive briefing on the specific environmental requirements that are relevant to their respective roles. Modifying individuals' actions might potentially provide an additional advantage of fostering a more resilient and ethically aware connection with the global society. In the event that laws, rules, and internal business-related goals are widely adopted, manufacturers will be compelled to integrate environmentally sustainable business practices due to limited alternatives. The implementation of environmentally conscious practices has the potential to provide cost savings for organizations in several areas, including reductions in overhead expenditures related to shipping, handling, labor, and material procurement. Achieving accuracy in manufacturing may be facilitated by the use of advanced techniques, resources, and equipment, all of which together enhance the overall quality of the final product. According to Ali (2022), firms may improve their reputation and make progress toward their environmental performance objectives by adopting green supply chain techniques.

In a previous study, Zhu & Sarkis (2004) conducted an assessment of the efficacy of several GSCM

techniques that may be used by businesses in China. In addition to examining the efficacy of adopting GSCM, scholars also explored matters pertaining to quality control and just-in-time production. To get a comprehensive understanding of the challenges associated with assessing the effectiveness of GSCM, it is recommended to refer to the scholarly work authored by Hervani et al. (2005). The findings indicate that Chinese automotive supply chain firms have strong internal motivations for adopting GSCM practices. This is shown by the adoption of GSCM by enterprises. The effect of commercial and regulatory challenges on enterprises is becoming more apparent, hence exerting a growing impact on customers. A model using the ISM framework was designed to enhance the dissemination of environmentally friendly approaches to supply chain management. The creation of this notion drew significant inspiration from case studies, which served as a key source of information. Based on the research conducted by Eltayeb et al. (2011), the implementation of green supply chain approaches yields many advantageous outcomes including environmental, economic, and societal dimensions. In a research conducted by Peng (2012), grey relational analysis was used in conjunction with the analytical hierarchy method to aid consumers in making informed choices about environmentally responsible service providers. Luthra et al. (2013) devised a method aimed at evaluating and prioritizing businesses based on their environmental friendliness.

The primary focus of this research project is on investigating the potential influence of Green Supply Chain Management (GSCM) techniques on the long-term sustainability of companies. The primary goal of Green Supply Chain Management (GSCM) is to mitigate the adverse impacts on the environment by adopting and enforcing ecologically appropriate policies and practices. The concept of "eco-innovation" encompasses several tactics that have been established to mitigate the environmental footprint of an enterprise. The tactics included in this list are referred to as "eco-design", "internal environment management", "eco-manufacturing", "eco-marketing", "eco-distribution", "investment recovery", "eco-education", and "eco-tourism." The primary objective of this research is to focus on identifying the specific factor inside an individual's circumstances that serves as the most significant determinant of long-term success. The interplay of environmental, social, and economic issues, with operational concerns, is crucial in attaining sustainable performance. The authors would like to acknowledge the contributions of Zhu et al. (2008); Green et al. (2012); Cankaya & Sezen (2018) for providing the dataset used in this study.

### **2.2.2 Sustainable performance**

The evaluation of the efficacy of environmental preservation efforts encompasses several factors, including both social and economic considerations.

The pursuit of economic prosperity, which is inherently linked to the attainment of overall profitability, serves as the primary impetus for organizations to embrace GSCM methods. The primary driver for organizations' adoption of GSCM solutions is this particular purpose. Zhu et al. (2008) argued that a key metric for evaluating a company's economic performance is its cost savings. This objective may be achieved by enhanced waste management practices, heightened energy efficiency measures, proper handling of corporate waste, and the establishment of penalties for environmental harm. Subsequently, we have facilitated the coordination of research pertaining to the correlation between GSCM practices and economic performance, as conducted by Chan et al. (2012); Kuei & Lu (2013); Sang M. Lee et al. (2013); Abdullah & Yaakub (2014). The aforementioned research used sales, earnings, and market share as indicators of economic success, deeming them pertinent irrespective of their actual occurrence.

The influence of GSCM on several aspects, such as the public perception of a business and its products, the well-being of employees, and the loyalty and satisfaction of customers, was examined by both Zailani et al. (2012) and Ashby et al. (2012).

Based on the conducted research pertaining to this matter, the incorporation of environmentally sustainable practices into a company's supply chain has the potential to enhance market penetration, productivity, and competitive advantage. It is evident that further study is necessary to explore the impact of green supply chain strategies on a business's financial performance and its ability to maintain competitiveness in the market. Numerous empirical studies have shown a positive association between the adoption of "green practices" and the attainment of superior levels of organizational performance, particularly with respect to their societal and environmental effect. Furthermore, acquiring data on the financial prosperity of a company and its market performance is not a challenging task (Rasheed, 2022).

### **2.2.3 Research hypothesis**

The major focus of the literature study was to analyze research on techniques pertaining to "green supply chain management" (GSCM) in various supply chain environments. Multiple study teams, such as Ninlawan et al. (2010), Green et al. (2012), S.M. Lee et al. (2012), Laosirihongthong et al. (2013) and Thoo et al. (2014), have conducted investigations into diverse approaches pertaining to GSCM. GSCM is a concept that encompasses four key components: internal environmental management, external GSCM, eco-design, and investment recovery. This framework was first proposed by Zhu et al. (2005). Holt & Ghobadian (2009) identified several key components within the domain of GSCM. These components encompass logistics, supplier assessment and evaluation, green logistics and procurement legislation, supplier education and mentorship, and industrial networks. These aforementioned actions represent a limited selection of the several essential tasks included within the discipline. The significance of GSCM is in its potential to facilitate the improvement of sustainability performance inside organizations (Ninlawan et al., 2010; Thoo et al., 2014). One of the key elements of GSCM pertains to the adoption and implementation of production, distribution, and logistical practices that are ecologically sustainable. Green et al. (2012) use a range of measures, including internal environmental management, eco-design, eco-information systems, green buying, consumer involvement, and investment recovery. These aforementioned techniques represent just a limited selection. Green et al. (2012) put up a proposal in the field of GSCM. GSCM is a comprehensive domain that incorporates many commercial and operational methods, as elucidated by Lee et al. (2012). Various methods, including eco-design, internal environmental management, ecologically responsible buying, and consumer engagement, have been identified and discussed. In the study conducted by Thoo et al. (2015), the researchers examined four key environmental management strategies, including internal environmental management, green procurement, green manufacturing, green distribution, and environmental education.

The term "Intra-organizational Environment Management" (IEM) pertains to the establishment and implementation of a series of standards and regulations inside an organization, aimed at promoting and nurturing a more sustainable environment. The assumption is supported by the research conducted by Zhu et al. (2005); Ann et al. (2006); Yang et al. (2010); Kim et al. (2011); Huang et al. (2012); Kuei & Lu (2013); Cheng et al. (2014); Feng et al. (2015).

**H1:** *There is a positive influence of internal environment management on sustainability*

Green procurement is a strategic methodology for the selection of suppliers that considers factors such as environmental performance, technical and ecological design, the ability to produce environmentally friendly products, and alignment with the environmental objectives of the host organizations (Paulraj, 2011). Assessing the technical, environmental, and social proficiency of suppliers is a crucial element in the practice of green procurement. This research emphasizes the use of paper and component boxes as exemplars of ecologically conscious procurement, in contrast to plastic bags or boxes. The implementation of this follows the "3R approach," which encompasses reduction, reuse, and recycling. Furthermore, the study conducted by S.M. Lee et al. (2012) highlighted many key aspects. Firstly, it underscores the shift from traditional paper-based procurement methods to electronic ordering systems. Secondly, it emphasizes the adoption of eco-labeling as a means to promote environmentally friendly products. Thirdly, it stresses the need of scrutinizing suppliers' environmental compliance certificates. Lastly, it underscores the significance of evaluating individual household environmental management practices.

**H2:** *There is a positive influence of green procurement on sustainability*

The term "green manufacturing" denotes a production approach aimed at reducing the ecological impact incurred during the manufacturing process of a product. The methodology necessitates the development and implementation of ecologically sustainable practices that align with the principles of waste minimization, reuse, and recycling, while concurrently mitigating waste generation, energy consumption, and the use of hazardous substances. The aforementioned principles include waste reduction, waste reuse, and waste recycling. Based on the findings of Green et al. (2012); S.M. Lee et al. (2012), a crucial element in the implementation of green manufacturing is the strategic design of products to facilitate the efficient reuse, recycling, and recovery of components and materials. Furthermore, it involves optimizing the use of energy and raw materials, while also minimizing or eliminating the utilization of potentially hazardous compounds throughout the whole of the production procedure. There are many benefits associated with environmentally-friendly manufacturing practices.

**H3:** *There is a positive influence of green manufacturing on sustainability.*

Several green distribution techniques may be used to promote sustainability. These strategies include lowering package quantities, prioritizing the utilization of recyclable or reusable materials, advocating for recycling and reuse practices, establishing standardized packaging protocols across providers, and encouraging the adoption of returnable packaging options. Holt & Ghobadian (2009) asserted that the use of recyclable pallets within warehouse operations facilitates the conservation of materials, minimizes unpacking time, and preserves energy resources.

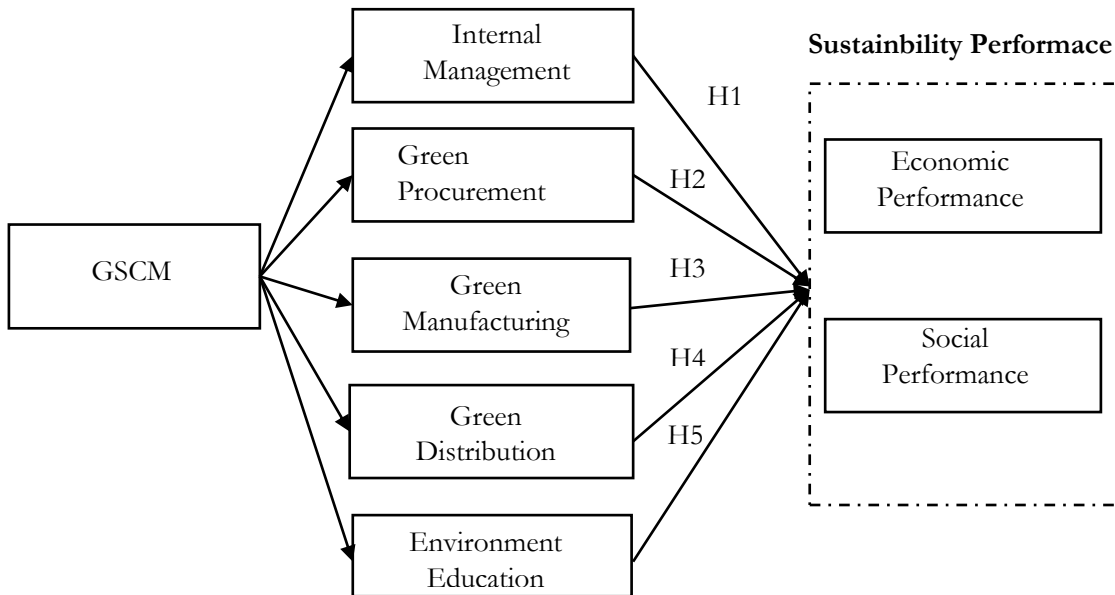
**H4:** *There is a positive influence of green distribution on sustainability.*

The recognition of the importance of education in ecological sustainability is growing, since it is seen as a vital tool for fostering personal growth and advancing social equity in self-reliant communities. In order to enhance the efficacy of environmental education, it is necessary to establish two fundamental goals. During the first stage of our project, our primary objective is to provide comprehensive education to all employees on the specific environmental regulations



that pertain to our organization. Based on the research conducted by Cankaya & Sezen (2018), it has been observed that people have the potential to contribute to the establishment of more safe and responsible global society via modifications in their behavioral patterns.

**H5:** *There is a positive influence of environmental education on sustainability.*



**Figure 1.** Conceptual framework

### 3. Results

The results of this study were derived from responses collected by a survey sent to a sample of 393 undergraduate students majoring in business, who were currently enrolled in academic programs situated in Can Tho City. The primary aim of this research is to assess students' level of understanding of GSCM and its impact on enhancing the financial performance of firms and their social consequences. The secondary purpose of this research is to ascertain the factors that impact students' attitudes toward GSCM. Based on the descriptive data shown in Table 1, it is evident that male students constituted 58.58% of the overall population of 393 respondents, whilst female students accounted for 41.42% of the sample. The percentage of students who pursued a degree in business administration accounted for 42.8% of the overall student population, whilst the proportion of international students specializing in business constituted 57.2%. The age range of the participants spanned from two to three years, with the majority consisting of college students pursuing studies in economics. These individuals have prior knowledge and expertise in supply networks and have also shown a keen interest in the field of environmental sustainability.

**Table 1.** General information

Description	N	Percentage (%)
Gender		
Male	231	58.58
Famale	162	41.42
Major		
International Business	225	57.2

Business Administrator	167	42.8
Years		
Sophomore	42155	10.739.4
Third-year student		
Final year students	196	49.9

**Source:** Field Survey Data, 2023

Y. A. Wang & Rhemtulla (2021) use contemporary statistical techniques, such as Structured Equation Modeling (SEM), to examine the associations among variables. The AMOS.22 software package and Structural Equation Modeling (SEM) methodology are used for the purpose of hypothesis testing. The assessment of the validity and trustworthiness of concepts may be conducted via the use of statistical techniques such as Confirmatory Factor Analysis (CFA). Table 2 presents the comparative weight and level of confidence associated with each concept. The constructs of internal environmental management, green buying, green manufacturing, green distribution, environmental education, economic efficiency, and social efficiency have strong internal consistency, as shown by high Alpha Cronbach coefficients. Specifically, the Alpha Cronbach coefficients for these constructs range from 0.832 to 0.942 for internal environmental management, 0.795 to 0.904 for green purchasing, 0.913 to 0.939 for green manufacturing, 0.815 for green distribution, 0.913 for environmental education, 0.939 for economic efficiency, and 0.815 for social efficiency. The study conducted by De Leeuw et al. (2019) revealed that the Alpha Cronbach values were above 0.7, indicating a robust level of reliability in the relationship between latent and observable variables.

**Table 2.** Factor loading and the Cronbach's  $\alpha$  estimates (Cronbach's Alpha)

<b>Internal environment management (Cronbach's Alpha)</b>		<b>0.832</b>
IEM1	Senior managers should commit to GSCM	0.714
IEM2	Mid-level managers have supported GSCM.	0.768
IEM3	Create a cross-functional collaboration team.	0.820
Green procurement (Cronbach's Alpha)		0.942
GP1	Ensure that vendors adhere to your environmental standards.	0.931
GP2	Require suppliers to have ISO 14000	0.929
GP3	purchase environmentally friendly materials	0.929
GP4	Purchase energy-saving devices.	0.926
GP5	Buy products with an eco-label.	0.928
Green manufacturing (Cronbach's Alpha)		0.795
GM2	Reduce the amount of materials used in packaging	
GM3	Encourage the usage of recycled materials and used items.	
Green distribution (Cronbach's Alpha)		0.904
GD1	Recycling in logistics, whether it is reused packaging or containers	0.891
GD2	Reuse of priceless parts from a discontinued product	0.891
GD3	Choose an approach that promotes greener transportation.	0.885
GD4	Use routing systems to reduce travel activity	0.878
GD5	To reuse faulty products, identify them.	0.872
Environmental education (Cronbach's Alpha)		0.913
EE1	Take part in government-funded and non-government programs regarding GSCM and sustainability.	0.874
EE2	Attend executive training sessions on GSCM and sustainability.	0.871

<b>Internal environment management (Cronbach's Alpha)</b>		<b>0.832</b>
EE3	Attend GSCM and sustainability training sessions as a management or member.	0.879
Economics Performance (Cronbach's Alpha)		0.939
EP1	Reduce cost for environmentally friendly input procurement	0.928
EP2	Reduce the cost of delivery and inventory	0.927
EP3	Reduce fee to waste discharge	0.929
EP4	Increase demand flexibility, delivery flexibility, and production flexibility	0.927
EP5	Ensure procurement and delivery on time	0.933
EP6	Take advantage of market demand for ecologically friendly products.	0.931
EP7	Obtain a certificate for the guarantee on green products.	0.931
Social Performance (Cronbach's Alpha)		0.815
SP1	Increased social and environmental responsibilities	0.781
SP2	Raising organizational capacity	0.760
SP3	Increase employees' motivation, health, and safety	0.760
SP4	Increase the appeal of green products to consumers and their satisfaction	0.772

**Source:** Field Survey Data, 2023

According to the findings shown in Table 3, it can be seen that all factor loading values are above the threshold of 0.5. This range is deemed acceptable based on the scholarly investigations conducted by Al-Lozi et al. (2018) and Sung et al. (2019). Rimkeviciene et al. (2017) introduced the use of a comparison approach within the context of covariance-based Structural Equation Modeling (SEM) to examine discriminant validity. The Kaiser-Meyer-Olkin (KMO) test was used to assess the suitability of the relationship performance measures in the factor analysis of the scale. All of the obtained data exceeded the permissible threshold of 0.5. In order for statistical significance to be established in the study, it was essential to have a KMO score beyond 0.5, specifically a score of 0.896. Furthermore, we eliminated any elements that have an eigenvalue above the threshold of one (1.011). Bartlett's test of sphericity may be used to ascertain the correlations among the observed variables within the factor. Bartlett's test results indicate a significant correlation between the observed variables inside the factor ( $p < 0.05$ ,  $\chi^2 = 0.00$ ). The factor loading coefficient is a statistical metric that quantifies the degree of association between two components. The factor loading coefficient of 0.7 for the relevant variable exhibits statistical significance. The collective loadings of all seven variables exceeded 0.70. Previous investigations have shown the validity of loadings that are equal to or higher than 0.50 Yu et al. (2013). In the concluding stage of the measurement procedure, we computed the mean values for each multivariate construct. The findings of the Exploratory Factor Analysis (EFA) suggest that the items should be appropriately positioned within the specified dimensions to meet the criteria of the Structural Equation Modeling (SEM) framework.

**Table 3.** Scale of factors and test parameters in Exploratory Factor Analysis (EFA)

Items	Factors						
	F1	F2	F3	F4	F5	F6	F7
IEM1	0.875						
IEM2	0.804						
IEM3	0.801						
GP4		0.852					
GP2		0.829					

Items	Factors						
	F1	F2	F3	F4	F5	F6	F7
GP3		0.808					
GP5		0.800					
GP1		0.782					
GM3			0.907				
GM2			0.907				
GD5				0.887			
GD4				0.849			
GD3				0.832			
GD2				0.822			
GD1				0.800			
EE2					0.875		
EE1					0.804		
EE3					0.801		
EP1						0.841	
EP2						0.825	
EP3						0.809	
EP4						0.806	
EP5						0.795	
EP6						0.710	
EP7						0.703	
SP2							0.801
SP3							0.785
SP1							0.756
SP4							0.723
Parameters of test							
Kaiser-Meyer-Olkin (KMO)							0.896
Cumulative % (Initial Eigenvalues)							75.986%
Bartlett's Test of Sphericity (Sig.)							0.000
Initial Eigenvalue							1.011

**Source:** Field Survey Data, 2023

In this study, Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) were used to assess the reliability and validity of the survey findings. The statistical analysis was performed using SPSS AMOS version 22.0. The modification index offers support for the model's ability to accurately establish the covariance relationship between variables E6 and E7, hence demonstrating the consistency of the data. Figure 2 illustrates the use of this methodology in assessing the covariance between items 8 and 9, displaying the resultant results. The study's results indicate that the structural model was correctly built, as shown by a p-value of 0.000 ( $p < 0.01$ ), a chi-square value of 1289.551 ( $df = 673,549$ ), a Good Fit Index (GFI) of 0.900, and an analysis result of 0.900. All of these personalities have considerable importance. A Tucker-Lewis index (TLI) of 0.954 (greater than or equal to 1.000), a Comparative Fit Index (CFI) of 0.960 (higher than or equal to 1.000), and a Root Mean Square Error of Approximation (RMSEA) of 0.048 (less than or equal to 0.080) are considered to meet the required thresholds for adequacy. Hair et al. (2010) were able to establish the reliability of the study model by using the aforementioned facts. The data collected is shown in Table 4.

**Table 4.** Model fit indicators in SEM

Indicators	Cut-off values	Calculated values	Conclusion
Chi-square/df	≤ 3.000	2.028	Fit
CFI	≥ 0.900	0.960	Fit
GFITLI	≥ 0.900 ≥ 0.900	0.9000.954	FitFit
RMSEA	≤ 0.080	0.048	Fit

Source: Field Survey Data, 2023

Note: Cut-off values adopted from Hair et al. (2009)

**Impact of GSCM on economic performance**

The impact of Green Supply Chain Management (GSCM) activities on economic efficiency was evaluated via the use of correlation coefficient and regression analysis. Economic efficiency, which is one of the two dependent variables associated with sustainable performance, was examined in this study. The results shown in Table 5 demonstrate a robust and statistically significant association between the implementation of GSCM approaches and the attainment of cost-effectiveness. The correlation coefficient R<sup>2</sup> of 0.483 indicates a strong positive correlation between the two parameters under consideration. The positive impact of GSCM on economic productivity has been well-established in previous research (1.1, 1.2, 1.3, 1.4, and 1.5). This study contributes to the existing literature on this topic. The presence of green purchasing was seen only via the implementation of a regression analysis, which aimed to assess each distinct GSCM activity. The study revealed a positive regression coefficient of 0.659 and a P value of 0.00, indicating statistical significance below the predetermined threshold of 0.1. Consequently, a consensus may be reached that H1.2 pertaining to the phenomenon of green purchasing behavior is accurate. However, it is worth noting that environmental education, corporate environmental management, and ecologically responsible production all possess significance ratings that exceed 0.1. Hence, the data does not support GSCM actions 1.1, 1.2, and 1.5. Insufficient evidence exists to either support or reject the null hypothesis about the negative regression coefficient of the green distribution's regression equation (1), as stated in hypothesis 1.4.

**Table 5.** Final Estimates of the relationship between GSCM and EP

Relationship	Estimateβ	S.E	C.R	P – value	Hypothesis Result
EP ← IEM (1.1)	-0.061	0.062	-0.983	0.326	Reject
EP ← GP (1.2)	0.659	0.056	11.780	***	Accepted
EP ←GM (1.3)	0.026	0.043	0.614	0.539	Reject
EP ←GD (1.4)	-0.164	0.046	-3.595	***	Not accepted
EP ←EE (1.5)	-0.021	0.061	-0.354	0.724	Reject
R <sup>2</sup> = 0.483 (EP)					

Source: Field Survey Data, 2023

$$EP = 0.659 GP - 0.164 GD \text{ (1)}$$

Equation (1) illustrates that economic performance is significantly impacted by two GSCM methods, namely green distribution and green procurement. Based on the first sample's value of 0.659, it can be inferred that green procurement has the greatest

advantageous impact on economic performance. This suggests that customers might potentially enhance economic productivity by making purchases in a more environmentally responsible way, with the assurance of using products and services that comply with rigorous sustainability standards. In contrast, the allocation of green resources has a negative effect on economic prosperity.

### Impact of GSCM on social performance

Table 6 presents the results pertaining to the impact of Green Supply Chain Management (GSCM) on social performance, as hypothesized in hypotheses 2.1 to 2.5. The beta coefficients indicate a statistically significant positive relationship between internal environmental management ( $\beta = 0.116$ ), green buying ( $\beta = 0.275$ ), and green manufacturing ( $\beta = 0.103$ ) and social performance, as shown in Table 6. The P values associated with hypotheses 2.1, 2.2, and 2.3 are all below the predetermined significance level of 0.1, providing evidence to support these hypotheses. The hypothesis is being rejected based on the observation that the distributed beta value of 0.024 has a detrimental effect on social performance and possesses a statistical significance above 0.1. The inclusion of environmental education in the regression equation (2) is justified by its ability to enhance social performance, which goes against hypothesis 2.5. The data suggests that environmental education has a coefficient of 0.219.

**Table 6.** Final Estimates of the relationship between GSCM and SP

Relationship	Estimate $\beta$	S.E	C.R	P – value	Hypothesis Result
SP $\leftarrow$ IEM (2.1)	0.116	0.065	1.789	0.074	Accepted
SP $\leftarrow$ GP (2.2)	0.275	0.054	5.111	***	Accepted
SP $\leftarrow$ GM (2.3)	0.103	0.050	2.055	0.040	Accepted
SP $\leftarrow$ GD (2.4)	-0.024	0.047	-0.515	0.606	Reject
SP $\leftarrow$ EE (2.5)	-0.219	0.065	-3.399	***	Not accepted
<b>R<sup>2</sup> = 0.120 (ENP)</b>					

**Source:** Field Survey Data, 2023

$$SP = 0.116 IEM + 0.275 GP + 0.103 GM - 0.219 EE \quad (2)$$

The findings derived from Equation (2) indicate that there are four key dimensions of Green Supply Chain Management (GSCM) that have a substantial impact on the overall societal performance within the realm of sustainability. These findings are consistent with the results of other studies. This structure consists of four main components, namely internal environmental management, green distribution, green production, and green buying. The first measurement for "green purchasing" yields a value of 0.275, which is notably higher compared to the values associated with the other choices. This research elucidates the significance of environmentally responsible buying in relation to the efficacy of community development endeavors. Green buying is a viable strategy for fostering sustainable development, enhancing social equity, and facilitating a holistic improvement in the standard of living. The findings of further inquiries, as shown by the studies done Y. S. Chen & Chang (2013), provide support to the present study. The findings of the current study align with previous research conducted by Adnan et al. (2021); Benedict et al. (2022); Febry et al. (2022), which demonstrated that the

implementation of environmentally sustainable manufacturing methods and internal environmental management strategies resulted in enhanced social performance. Cankaya & Sezen (2018) performed a study to investigate the effects of incorporating environmental education into school curricula on the academic and social outcomes of students. Their findings indicate that the inclusion of environmental education did not yield any negative consequences on the academic or social performance of pupils. This finding illustrates the capacity of environmental education to enhance public consciousness and foster the adoption of sustainable behaviors, although with a potential delay in the manifestation of outcomes.

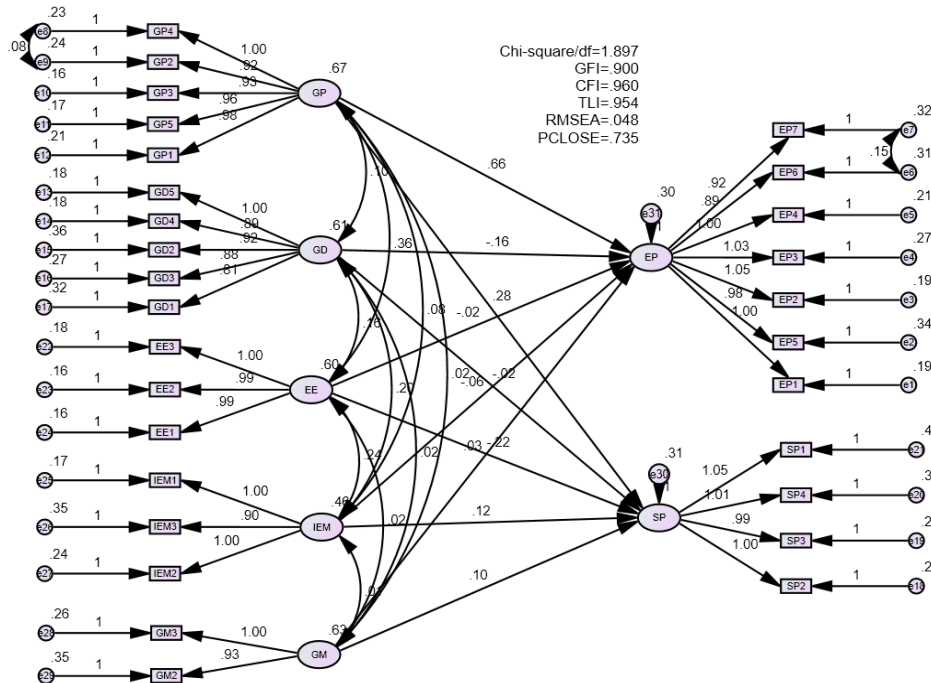


Figure 2. Model SEM relationship GSCM and Sustainability Performance

#### 4. Discussions

##### Economic performance aspect

The use of structural equation modeling in this study demonstrates that economic performance is solely determined by environmentally responsible buying. The results of the current study align with a significant amount of previous research that has reached similar conclusions (Hassan et al., 2016; Wisdom et al., 2019; Le, 2020; Adnan et al., 2021; Febry et al., 2022). The results of the survey also demonstrate a noteworthy association between higher income and consumer behaviors that exhibit more sensitivity toward their environmental consequences. Several studies have shown a positive association between the use of environmentally friendly products and services and the subsequent growth of economic productivity. The findings also suggest that adopting environmentally friendly purchasing practices may have a positive impact on a company's financial success. Zailani et al. (2012) propose that an effective strategy for enhancing a business's reputation among the general public involves the implementation of

environmentally responsible purchasing practices.

The analysis conducted did not provide any substantial evidence indicating a correlation between environmental performance and the many dimensions of environmental sustainability explored, including internal environmental management, green manufacturing, green distribution, and environmental education. This data indicates that the internal environment of the research is unaffected by EP, aligning with the results reported by Benedict et al. (2022). No evidence was discovered to substantiate the hypothesis positing a correlation between Environmental Performance (EP) and environmentally friendly output. This outcome aligns with the conclusions drawn in the research conducted by Sezen & Cankaya (2013). The conclusions drawn by Febry et al. (2022) and Le (2020), which indicate little progress in EP adoption via green distribution, find validity in the data we have collected. In contrast to the research conducted by Febry et al. (2022) and Adnan et al. (2021), our study did not reveal a significant association between Environmental Education (EE) and Environmental Performance (EP).

### **Social performance aspect**

There exists a significant positive correlation between internal environmental management, green buying criteria, and social performance. The research results presented in this study establish a clear correlation between internal environmental management techniques within green supply chains and their subsequent influence on societal performance. The findings derived from the studies conducted by Adnan et al. (2021), Benedict et al. (2022) and Febry et al. (2022) are consistent with the aforementioned conclusion. According to existing research, the effective implementation of internal environmental management initiatives requires the establishment of a cross-functional cooperation team and the demonstration of a strong commitment to the green supply chain by top management. The study findings indicate that the adoption of green procurement methods and the implementation of internal environmental management practices by enterprises lead to enhanced levels of customers' pride, loyalty, dedication to social values, and satisfaction. Green manufacturing is an approach to production that incorporates considerations of environmental, social, and economic dimensions, aiming to mitigate adverse impacts on each of these aspects. Green manufacturing has the capacity to enhance social outcomes by generating superior products and services that provide benefits for consumers, workers, and communities. Several study groups, such as Dangelico & Pujari (2010); X. Chen et al. (2018); Singh et al. (2019), have consistently reported similar results.

## **5. Conclusion**

This study adds novel insights to the current corpus of knowledge about green supply chain management (GSCM) strategies and their diverse effects on a company's ability to uphold its sustainability objectives. The primary aim of this research is to construct and evaluate a conceptual framework that delineates the relationship between the principles of Green Supply Chain Management (GSCM) and the concept of sustainable development. The achievement of this purpose will be facilitated by properly considering the impact of economic and social factors, which will serve as the central focus of this study endeavor. This study aims to fill a knowledge vacuum by focusing on the job opportunities that are accessible to economics students with an interest in pursuing business professions. In order for individuals to effectively contribute to the success of firms and the overall economy, it is essential that they possess a



comprehensive comprehension of the expectations placed upon them. Furthermore, this study develops a theoretical framework that utilizes the cognitive abilities of economics students as a mediating variable to establish a link between Green Supply Chain Management (GSCM) practices and sustainable performance. The framework used in this research was developed by the authors. Prior studies have mostly overlooked the importance of economics education, instead focusing on examining the effects of Green Supply Chain Management (GSCM) practices on corporate performance and perceptions.

This research not only supports existing beliefs on the connection between green supply chain practices and sustainable performance, but it also contributes to the empirical understanding of this relationship by highlighting the economic factors that influence it. The findings of this study provide insights into the many ways in which environmentally conscious practices throughout the supply chain contribute to each of the sustainable performance indicators. Based on the findings of the study, which augment the current corpus of data, environmentally conscientious consumerism has the capacity to include both categories of sustainable performance metrics. The promotion of environmental consciousness among students enrolled in economics courses is crucial for fostering a societal culture that embraces sustainable consumption practices. As a result of their specialized knowledge in the subject of economics, students pursuing this discipline possess a distinct advantage over their counterparts in comprehending and assessing matters pertaining to environmentally sustainable consumption. This phenomenon may be attributed to the prominence of economics as a widely recognized academic field. Consequently, they possess a comprehensive comprehension of the need of advocating for sustainable development. Individuals studying economics have the capacity to serve as prospective clientele due to their propensity to exert influence on both their own purchasing patterns and the buying behaviors of others in their immediate social circles. Given these circumstances, it is imperative and advantageous to impart knowledge on green consumerism to economics students, as it has the potential to foster a greater inclination towards environmentally sustainable purchasing decisions in the future. Consequently, it is essential to provide economics students with a more comprehensive understanding of green consumerism.

This research lays considerable importance on the advancement of environmentally sustainable supply chains and the evaluation of firms' social performance. They exhibit a strong bond of friendship and actively contribute to the collective efforts aimed at promoting the advancement of sustainable development. Business enterprises must not just depend on the support of their partners for the establishment of a viable supply chain; rather, they should actively include students in this endeavor. It is imperative for organizations seeking to positively influence the environment, economy, and society to use environmentally-friendly production processes and internally apply environmental management practices to improve social performance. The extent to which students' buying habits, employment objectives, and involvement in their communities are influenced by their understanding of the green supply chain and social performance might vary. The aim of increasing students' understanding of sustainable practices, circular economies, and social performance is a goal that has considerable importance and worth.

Based on the extant research, no discernible correlation seems to exist between ecologically conscious distribution and education, as well as environmentally conscious efficiency. This statistic highlights the little understanding among those pursuing a degree in economics on the need for environmentally sustainable practices in achieving long-term success in manufacturing

and distribution. This phenomenon may be attributed to the prioritization of environmental impact reduction during the transportation of goods by green distribution practices, with less focus placed on incorporating value-added features as necessary means to achieve this objective. The viewpoints of students on the world may be shaped by a diverse range of characteristics, including their engagement with environmental education, gender, age, academic discipline, professional background, and level of knowledge acquisition. In order to promote sustainable development in the realms of economics, the environment, and society, it is imperative for institutions of higher education to prioritize the importance of internal environmental management, green purchasing, green manufacturing, green distribution, and environmental education.

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