

## Contribution To Sustainable Development: Study Case About Influencing of Green Supply Chain Management on Environmental Efficiency

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### Abstract

*The primary objective of this research is to contribute to the academic debate by examining the many elements that impact the effectiveness of Green Supply Chain Management (GSCM) in improving environmental outcomes. The primary aim of this study is to examine the impact of GSCM on environmental performance. The primary objective of this research is to assess the conceptualization of the link between GSCM and environmental performance among economics students residing in Can Tho City, Vietnam. A comprehensive survey was administered to a cohort of 526 students presently enrolled in business administration or international business courses. The objective of this research was to investigate the impact of several dimensions of GSCM on ecological performance. Various initiatives were undertaken, including environmental awareness campaigns, the adoption of sustainable manufacturing practices, the implementation of environmentally-friendly retail strategies, and the establishment of green procurement rules. The observed correlation coefficients between green procurement, internal environmental management and environmental performance vary from 0.143 to 0.243, suggesting a positive association among these variables. The academic literature has documented many instances in which GSCM has shown its ability to enhance environmental performance. Based on the research results, it can be inferred that the level of proficiency in GSCM will have a substantial influence on the professional contributions of graduates within their respective domains, as well as on the progression of environmental sustainability. The likelihood of people attaining success as firm owners and entrepreneurs is increased when they actively pursue further education via enrollment in a higher education institution, such as a college or university, and dedicate their academic endeavors to obtaining a business degree. Hence, affluent corporation proprietors possess the capacity to augment their enterprises, hence engendering substantial macroeconomic advantages. Incorporating teachings on corporate social responsibility (CSR), volunteering, and environmentally conscious manufacturing practices into the curricular framework of educational institutions is of utmost importance. It is important to provide assistance for the sustained welfare of businesses, local communities, and the environment. The integration of environmental responsibility with ethical company operations has paramount importance.*

**Keywords:** Green supply chain, environmental efficiency, contribution.

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## 1. INTRODUCTION

The concept of globalization has significantly contributed to the development of worldwide industrial business. The implementation of this method leads to a notable rise in carbon emissions, hence resulting in substantial environmental consequences. The phenomenon of corporations increasingly relocating their industrial activities to other nations is seeing a growing momentum. The rapid expansion of the logistics sector, which encompasses the transportation and distribution of goods, has exerted considerable pressure on its operational capabilities (WTO, 2014). The Paris Climate-Friendly City Conference, held in 2016, provided a forum for national governments, global stakeholders, and multinational corporations to participate in dialogues concerning inventive approaches to environmental preservation, as stated by the United Nations Framework Convention on Climate Change (2017). The primary emphasis of these talks were on strategies aimed at mitigating greenhouse gas emissions and enhancing air quality.

The adoption of the "Green Concept" is increasingly acknowledged by corporations globally as a possible strategic approach to addressing the aforementioned issues. Many enterprises have prioritized enhancing their resource efficiency while simultaneously mitigating the adverse impacts on employee well-being, environmental sustainability, and productivity. The effective management of the supply chain plays a crucial role in the daily operations of the manufacturing industry. Numerous industrial organizations have used GSCM strategies to mitigate their environmental footprint by reducing resource depletion, pollution, waste creation, and emissions. The concept of GSCM was introduced in 2012 by Waidyasekara and Sandamali. The objective of this method is to enhance economic performance while concurrently mitigating the negative environmental impacts associated with industrial activities. Scur and Barbosa (2017) suggest that the concept of "Green Supply Chain Management" (GSCM) emerged as a proactive measure in addressing various ecological concerns such as pollution, deforestation, and resource depletion. Numerous organizations have been incorporating ecologically conscious business practices into their routine operations to effectively execute the aforementioned pioneering approach. Chinese manufacturing companies, which possess a substantial share of the global supplier market, have adopted several preventive measures. Notably, they have implemented environmentally sustainable supply chain management practices and demonstrated strict compliance with relevant environmental regulations. Luthra et al. (2013) argue that given the emergence of this novel paradigm, it is imperative for firms to give precedence to the advancement of ecologically sustainable and strategically oriented management practices above immediate financial benefits. This proposal is based on the need for companies to adapt to the emerging paradigm. Due to the significant focus garnered by prominent businesses in the realm of adopting and executing GSCM, it is imperative to examine the potential impact that GSCM may have on Small and Medium Enterprises (SMEs). To enhance motivation and facilitate the development of a more sustainable framework, it is essential to assess and actively include small firms in the realm of environmental conservation. Engaging in this practice will contribute to the establishment of a more sustainable foundation.

The heightened awareness and significance of environmental issues in contemporary culture may be attributed to the growing consumer preference for environmentally friendly products. The use of state-of-the-art technologies and methodologies is essential in mitigating the adverse environmental impacts attributed to corporate entities, advertising practices, and suppliers. According to Chiou et al. (2011), green enterprises prioritize both environmental sustainability and commercial viability to an equal extent. In order to keep a competitive edge in the business realm, it is essential to implement rigorous management practices within supply chains that adhere to environmental sustainability principles. The concept of GSCM has garnered significant attention from the United States, the European Union, and Japan. In recent years, several renowned

firms from various regions throughout the world have effectively adopted Green Supply Chain Management, also referred to as GSCM. Based on the research conducted by Cankaya and Sezen (2018), it has been shown that organizations that prioritize sustainability are more effective in enhancing their visibility, attracting and retaining customers, and attaining overall success.

The objective of this study is to examine the possible influence of GSCM on environmental consequences. "Green Supply Chain Management," often referred to as "GSCM," encompasses several sectors such as manufacturing, procurement, transportation, and education. Numerous studies, including those conducted by Zhu et al. (2008), Green et al. (2012), and Cankaya & Sezen (2018), have examined the impact of various environmental conditions on the potential for long-term survival.

## 2. METHODOLOGY

### 2.1 Literature review

According to Schmidt et al. (2017), the implementation of green supply chain management (GSCM) has a favorable impact on market performance and financial success of businesses. Paulraj (2011) posits that the establishment of a positive feedback loop may be seen when the allocation of resources is redirected towards the support and advancement of environmentally conscious initiatives, hence contributing to the progress of environmental sustainability. Hence, the enhancement of the environmental sustainability of a region may be achieved via the deliberate choice of goods and the thorough examination of pertinent environmental, social, and economic factors. The findings of this study provide empirical evidence that aligns with the assertions put out by Chan et al. (2012) on the potential enhancement of a firm's sustainability performance via the implementation of a comprehensive internal environmental management system. These assumptions were posited with regards to a company's ability to mitigate its adverse environmental effects. Singh and Pandey (2012) argue that the incorporation of environmental factors into marketing strategies has the potential to provide advantageous outcomes for a company's Corporate Social Performance (CSP), reputation, and the public's trust in the firm. When advocating for environmental sustainability and emphasizing the need of adopting ecologically sound distribution and packaging practices, comparable advantages were seen as a result of these efforts. Zsidisin and Siferd (2001) conducted a study that demonstrated the capacity of environmentally friendly packaging to mitigate negative environmental impacts via the adoption of recycling measures. In a similar vein, Kumar et al. (2015) conducted a research which demonstrated that the adoption of ecologically sustainable distribution systems has the capacity to reduce dependence on petroleum by optimizing shipping routes.

Based on the findings of the study, it can be inferred that the use of ecologically conscious strategies for supply chain management has promise for enhancing an organization's enduring environmental sustainability. Based on the study conducted by Pratiwa and Widodob (2019), it was determined that the adoption of GSCM practices has a beneficial influence on the sustainability performance shown by enterprises. The study conducted by Ikegwuru and Pokubo (2018) presents empirical evidence that establishes a correlation between the implementation of ecologically friendly supply chain management practices and positive environmental results. The available research indicates that the use of these strategies has a beneficial effect on the environment. The data used for this study was obtained from petrol stations located within the geographical confines of Rivers State, Nigeria. Throughout the duration of the evaluation, a variety of statistical techniques were used, including reliability and validity assessments, alongside a correlational investigation. The findings provide empirical support for the notion that economic, environmental, and social sustainability have a significant influence on environmental performance, and moreover, highlight the deep interconnectedness of these

aspects. Moreover, the results indicate a strong correlation between these attributes. The objective of the study conducted by Sungchul and Alex (2011) was to assess consumer responses in relation to three dimensions of sustainability, namely economic and environmental concerns, as well as cost considerations. The researchers used an experimental strategy to assess the nature of the relationship between the two variables. Based on the findings of this study, it is evident that consumers exhibit a propensity for embracing sustainability via several means, including the scrutiny of business practices and the manifestation of a predilection for sustainable products. This desire might be seen as a manifestation of the consumers' support for sustainability. In contrast to a firm's neglect of long-term economic sustainability, the lack of willingness on the side of a corporation to engage in environmental preservation initiatives generates a far higher level of adverse consumer response.

The findings of the study indicate that consumers do not assign significant importance to low price when they are aware of a company's inadequate commitment to environmental sustainability. This is shown by the observation that customers do not attribute significant importance to reduced price. The findings of this study indicate a positive association between the adoption of sustainable business practices by corporations and the level of consumer endorsement for environmentally conscious legislation. The environmental performance of a business may be positively influenced by the adoption of sustainable supply chain management (SSCM) practices, as shown in prior research conducted by Yu and Ramanathan (2015) and Zhu et al. (2012). The study conducted by Zhu, Sarkis, and Lai (2007) revealed that integrating eco-design concepts into the management framework of supply chains has shown enhanced environmental performance.

A multitude of scholarly investigations have shown that the use of GSCM solutions has the potential to provide improved operational, economic, and environmental outcomes. Consequently, this has the capacity to foster heightened levels of competition within a commercial context. Previous studies conducted by Florida (1996) and Zhu & Sarkis (2004) have shown that the adoption of GSCM practices has the capacity to considerably enhance environmental performance. Geffen and Rothenberg (2000) propose that collaborative engagement with providers has the capacity to expedite the implementation of ecologically sustainable practices. Research has shown that supplier-customer cooperation, cooperative research and development (R&D) initiatives, and many other forms of supplier-customer partnership have a beneficial effect on the environment. The adoption of environmentally friendly business practices is often motivated by the objective of firms to enhance their profitability. Wagner et al. (2001) argue that the economic outcomes of GSCM initiatives are subject to a certain level of uncertainty. The aforementioned conclusion has been reached by the researchers. According to Alvarez Gil et al. (2001), there is a claim that the implementation of environmental management strategies, namely GSCM, may positively impact the financial performance of companies. Several scholars, including Dodgson (2000), Dyer and Singh (1998), and Von Hippel (1998), among others, have expressed their dissent regarding the notion that inter-firm interactions encompass both formal and informal mechanisms that foster trust, mitigate risk, and consequently enhance innovation and efficiency. Based on the already available data, a tenuous correlation may be seen between the implementation of environmentally conscious policies and the attainment of favorable outcomes in corporate operations. According to Szwilski (2000) and Hajikhani et al. (2012), environmental management operations are regarded as innovative and progressive business practices.

To achieve a comprehensive integration of environmental consciousness, it is essential to prioritize behaviors and activities that promote environmentally beneficial and ecologically sustainable lifestyles, alongside decision-making processes. Verma et al. (2018) emphasize the need of implementing strategies aimed at safeguarding the Earth's natural resources to guarantee its availability and enjoyment for future generations. The findings of Jaggernath and Khan's (2015) study, as well as the research conducted by

Verma et al. (2018), demonstrate that companies that demonstrate social responsibility are more likely to attain cost efficiencies and mitigate their environmental footprint. According to the findings of the investigation that was carried out by Cosimato and Troisi (2015), the use of green supply chain collaboration has the potential to increase efficiency while simultaneously lowering the amount of waste that is produced. The adoption of GSCM as a proactive environmental approach may provide many advantageous outcomes for the organization's operations. In their study, Zhu et al. (2013) conducted a survey of 396 Chinese enterprises to objectively examine the relationship between institutional constraints, GSCM practices, and organizational performance. The survey was conducted with the purpose of accomplishing this objective inquiry. There is a possibility that the use of GSCM strategies may provide little impact. Modifications to the environmental and operational prerequisites may be crucial to achieve sustainable and environmentally conscientious economic expansion. In their study, Zhu et al. (2017) undertook an investigation into the impact of customer relational governance (CRG) on the interplay between green innovation and purchasing, both of which are integral components of GSCM. Additionally, the researchers examined the outcomes of these relationships in relation to the environmental and economic performance of the organization. As part of this study, questionnaires were sent to a sufficiently representative sample of Chinese towns with a specific emphasis on their export activities. Rosaangla et al. (2017) discovered a favorable association between GSCM and many dimensions of supply chain performance in their investigation of the Brazilian automotive supply chain. The facets including supply chain performance are economic performance, environmental performance, and adoption. Furthermore, the researchers discovered a good association between the ideas of GSCM and the performance of the supply chain. The aforementioned discovery aligns with the results obtained in the research conducted by Feng et al. (2018).

The use of GSCM methodologies enables firms to effectively pursue their objectives while concurrently adopting ecologically sustainable practices. Wei et al. (2016) suggest that collaborative endeavors has the capacity to maintain crucial attributes such as quality, cost, reliability, efficacy, and energy conservation, while concurrently mitigating adverse environmental consequences. Professionals engaged in the supply chain industry use GSCM solutions to enhance their financial and social status, while also addressing the adverse environmental consequences associated with industrial operations. The potential benefits of using GSCM in company operations have been identified in a research conducted by Shafique et al. (2017). According to the studies conducted by Wei et al. (2016) and Shafique et al. (2017), the key aim of using GSCM strategies is to attain financial cost reductions with environmental and social benefits. The use of GSCM methods by supply chain administrators has promise for making a positive impact on the long-term conservation of the environment. Based on the study conducted by Li et al. (2015), the use of supply chain optimization methods had positive effects on both cash flow and customer-perceived value over the whole lifespan of a product. Schmidt et al. (2017) posit that various factors, such as the organization's energy and raw material consumption efficiency, waste reduction efforts, and implementation of novel process innovations, can exert a substantial impact on the financial performance of an organization over the entire product lifecycle. Yang (2017) has shown that the implementation of green supply chain strategies may potentially enhance a brand's reputation, as well as bolster a company's social legitimacy and competitive standing. According to the findings of Yang (2017) and Li et al. (2015), organizations may get two distinct operational benefits by using environmentally sustainable supply chain methods. One way to enhance ethical business practices is via the adoption of proactive environmental policies. Collaborative endeavors, both in terms of strategic and operational aspects, have the potential to enhance the advancement of environmentally sustainable supply chains. Li et al. (2015) have shown that the implementation of environmentally sustainable product design has the potential to enhance both

environmental and economic outcomes. Based on the results of current research, supply chain models that prioritize environmental responsibility have shown advantageous outcomes in terms of cost reduction and carbon emission reduction. Reducing one's ecological footprint is crucial for actively contributing to environmental conservation and the sustainable preservation of natural resources. The study conducted by Yang (2017) and Grandiere (2019) has shown that the implementation of environmentally sustainable solutions and collaborative efforts may provide advantages in terms of both economic and environmental performance

## 2.2 Data collection

The current study includes data from 526 first-year college students intent on earning an economics degree. The students were all in their third year of university. The majority of the students were pursuing degrees in business, while some were studying international business, hotel management, or even multimedia and communication. Participants were chosen for the study in a methodical manner by the researchers. On January 15, 2023, after classes ended for the semester, a group of researchers began collecting data via a 10-week series of drop-in sessions. On November 1st, 2022, the sessions are slated to begin. Over the course of ten weeks, 526 participant questionnaires were collected. The survey placed a heavy emphasis on identifying potential means of adjusting selected. Categorical variables such as age, education, and gender were considered to provide a solid control framework for the research. The participants' opinions on the study's two primary aspects were evaluated using a Likert scale with a range of one to five. There was a range of values from one to five on the gauge, with one representing a condition of great discord and five representing great harmony. The primary goal of the first survey questionnaire was to evaluate the efficacy of GSCM, and it included 33 questions. There were nine questions in the test, covering a wide range of topics. There were a total of ten questions asked in the context of the study, five of which were about environmentally responsible purchasing, four about environmentally responsible production, five about environmentally responsible distribution, and three about environmental education. Previous work by Xie and Breen (2012), Ghobakhloo et al. (2013), Dadhich et al. (2015), and Bu et al. (2020) was used to fine-tune the parameters. The grading instrument that followed placed special emphasis on sustainability's environmental component. There were a total of five questions on the survey form.

## 2.3 Research hypothesis

The issue of Control and Management has significant importance within the profession of GSCM. This study focused on internal environmental management, external GSCM, environmentally friendly product design, and the financial return on investment as its primary topics of investigation. In their comprehensive analysis, Holt and Ghobadian (2009) provided an in-depth examination of the procedural requirements necessary for the effective implementation of GSCM. The subject encompasses various domains, including logistics management, supplier evaluation, the development of environmentally sustainable logistics and procurement practices, supplier guidance and support, and the establishment of effective industrial networks. Scholars such as Ninlawan et al. (2010) and Thoo et al. (2014) have emphasized the need of integrating environmentally responsible practices in the domains of production, distribution, and logistics as part of the broader framework of GSCM. There exists a consensus among scholars and professionals in the field that the adoption of these methods is essential in several areas of the business world in order to enhance sustainable performance. The concept of "Green Supply Chain Management" (GSCM) encompasses a range of strategies and methodologies used by organizations to effectively tackle environmental challenges. The aforementioned tactics and strategies are often known as "green." In their comprehensive study, Green et al. (2012) provide an extensive range of diverse techniques that may be used for the effective implementation of GSCM. Exemplary instances of these strategies include internal environmental management, green information systems, green

procurement, client engagement, environmentally conscious design, and investment recuperation. Additional illustrations include environmentally conscious design. According to Lee et al. (2012), GSCM encompasses a range of corporate and operational strategies, such as internal environmental management, green procurement, customer involvement, and eco-design. Thoo et al. (2015) conducted an assessment to determine the efficacy of GSCM systems. The examination included four key domains: internal environmental management, environmentally conscious manufacturing, sustainable distribution, and green procurement. Furthermore, the study examined the impact of environmental education on the overall performance of GSCM systems.

The use of the abbreviation "intra-organizational environment management" (IEM) is a customary approach in scholarly discourse to denote the actions carried out by a corporation with the aim of promoting environmental sustainability. This subject matter has garnered considerable attention from scholars, leading to a substantial body of research. Multiple studies, such as those conducted by Zhu et al. (2005), Ann et al. (2006), Kim et al. (2011), Huang et al. (2012), Kuei and Lu (2013), and Cheng et al. (2014), provide empirical support for this theoretical proposition.

*H1: The relationship between internal environment management and environmental performance is positive.*

The concept of "green procurement" refers to a strategic strategy used by buyers, whereby they purposefully seek out suppliers that align with and actively promote the buyer's environmental aims and objectives. This particular interpretation of the concept of "green procurement" is but one of several potential understandings of the phrase. Paulraj (2011) defines "green procurement" as a strategic approach that involves evaluating suppliers based on their technical, environmental, and social attributes in order to inform decision-making processes. Priority is given to the procurement of paper and component containers that prioritize environmental sustainability, specifically focusing on materials like plastic bags and cartons. The concepts of the 3Rs (reuse, recycle, and reduce) are given particular importance, and may be succinctly described as "reduce, reuse, and recycle." The study emphasizes the need of implementing strategies to reduce reliance on paper, such as using electronic communication methods for transmitting purchase orders. Furthermore, the research emphasizes the need of implementing these strategies. Ninlawan et al. (2010) and Lee et al. (2012) argue that the green procurement process need to include essential elements, including the incorporation of environmental compliance certifications, the use of eco-labeling practices on products, and an assessment of a firm's internal environmental management systems.

*H2: The relationship between green procurement and environmental performance is positive.*

Based on the findings of Green et al. (2012) and Lee et al. (2012), a company may be deemed environmentally sustainable if it manufactures products that possess attributes facilitating the ease of material reuse, recycling, or recovery. The aforementioned result is derived from the study conducted by each of these organizations. The concept of "green manufacturing" pertains to a manufacturing approach that systematically considers environmental considerations across all stages of the production process. The implementation of chemicals with reduced adverse effects would be undertaken as a fundamental component of the suggested approach. Furthermore, the installation of energy-efficient lighting and heating systems would be undertaken. Furthermore, the concepts of "reduce," "reuse," and "recycle," often known as the "3Rs," would be included into practical implementations in a more thorough fashion. Ninlawan et al. (2010) propose an additional objective, which is to mitigate the volume of garbage that is disposed of and then transported to landfill sites. Efforts to accomplish this objective would be pursued.

*H3: The relationship between green manufacturing and environmental performance is positive.*

There are several strategies that may be used to mitigate the adverse environmental impacts resulting from the implementation of ecologically sustainable distribution networks. Potential solutions include the use of recyclable or reusable materials, the implementation of returnable packaging systems, the establishment of standardized packaging norms among suppliers, and the promotion of awareness about these alternative possibilities. Based on the study conducted by Holt and Ghobadian in 2009, the use of recyclable pallets has the potential to reduce material waste, decrease unpacking time, and minimize energy consumption inside warehouses.

*H4: The relationship between green distribution and environmental performance is positive.*

Within the framework of human development and the advancement of an inclusive and sustainable society, there has been universal acknowledgment of the paramount relevance of educating individuals about green settings. The effectiveness of environmental education hinges upon the achievement of two key objectives. It is important to ensure that all employees get comprehensive training aligned with the organization's approved environmental policy from the outset. According to Cankaya and Sezen (2018), the alteration in the conduct of individuals has the potential to enhance global governance and foster heightened accountability.

*H5: The relationship between environmental education and environmental performance is positive.*

### **3. RESULT AND DISCUSSIONS**

Wang and Rhemtulla (2021) used Structural Equation Modeling (SEM), a contemporary statistical technique, to examine the associations among several independent variables. The research conducted in this academic work used the method of Structural Equation Modeling (SEM) in combination with AMOS.22, a well recognized software tool. The research team empirically tested their hypotheses by performing experiments and afterwards evaluating the obtained data using the methodology expounded upon in this discourse. To evaluate the veracity and reliability of the assertions, a variety of statistical techniques were used, including Confirmatory Factor Analysis (CFA). Table 1 provides a comprehensive overview of the significance of each specific matter, along with the corresponding level of confidence associated with it. The constructs of internal environmental management, green buying, green manufacturing, green distribution, environmental education, and economic performance have a significant level of internal consistency, as seen by the Cronbach's alpha coefficients. The ideas of internal environmental management, green buying, green manufacturing, green distribution, environmental education, and economic efficiency exhibit a notable degree of internal consistency, as shown by Alpha Cronbach scores ranging from 0.828 to 0.930. This is shown by the observation that these thoughts exhibit a notable degree of internal coherence. The study conducted by De Leeuw et al. (2019) offers substantial empirical support for the enduring association between latent and observable variables, as shown by a Cronbach's alpha value over 0.70.

Table 1: Factor loading and the Cronbach's alpha estimates

Internal environment management (Cronbach's Alpha)		0.836
IEM1	Commit GSCM from senior managers	0.783
IEM2	Support to GSCM from mid-level managers	0.785
IEM3	Establish cross-functional cooperation team	0.786



IEM4	Take criteria to measure green quality	0.816
Green procurement (Cronbach's Alpha)		0.930
GP1	Ensure suppliers meet their environmental objectives	0.916
GP2	Require suppliers to have ISO 14000	0.915
GP3	Purchase materials with green attributes	0.911
GP4	Purchase equipment that saves energy	0.912
GP5	Purchase goods with eco-labeling	0.915
Green manufacturing (Cronbach's Alpha)		0.828
GM1	Ensure product have recyclable contents	0.781
GM2	Minimize the use of materials in packaging	0.775
GM3	Encourage reuse of products and recycled materials	0.755
GM4	Use Life Cycle Assessment to evaluate environmental load	0.818
Green distribution (Cronbach's Alpha)		0.911
GD1	Recyclable whether reusable package or containers in logistics	0.899
GD2	Reuse of valuable components of an end-of life product	0.896
GD3	Select a method about cleaner transportation	0.893
GD4	Use routing systems to reduce travel activity	0.888
GD5	Identify defective merchandise to reuse	0.880
Environmental education (Cronbach's Alpha)		0.907
EE1	Participate in non-government and government subsidized program about GSCM and sustainability	0.871
EE2	Participate training courses on GSCM and sustainability for executives	0.856
EE3	Participate training courses on GSCM and sustainability for managers and members	0.871
Environmental Performance (Cronbach's Alpha)		0.828
ENP1	Optimize process for waste and emission reduction, pollution control	0.781
ENP2	Recognize products of ecolabeling, recycled material, and design-for-assembly	0.801
ENP3	Save energy consumption and recycling process	0.790
ENP4	Encourage green and clean technologies use	0.778
ENP5	Increase efficiency in scarcity of resources, higher waste generation and waste disposal problem	0.820

*Source: Field survey data, 2023*

The factor loadings findings are shown in Table 2, with statistical significance denoted by a p-value below 0.5. Based on the results of the scholarly investigation conducted by Al-Lozi et al. (2018), and Sung et al. (2019), it is expected that the specified range will align with the permissible constraints. Rimkeviciene et al. (2017) conducted a study to examine the concept of discriminant validity. They used a comparative approach using structural

equation modeling (SEM) with covariance in their research. The Kaiser-Meyer-Olkin (KMO) test was used to assess the appropriateness of the factor analysis applied in the scale for evaluating the functionality of relationships. It has been determined that each value exceeds 0.5. Statistical significance may be shown when the KMO value exceeds 0.5. The current experiment yielded a Kaiser-Meyer-Olkin (KMO) test score of 0.873, indicating statistical significance. The exclusion of items from the investigation was based on their eigenvalues exceeding the predetermined threshold of 1.176. The Bartlett's test of sphericity is a necessary procedure to assess the interrelationships among the observed variables included inside the factor. The statistical analysis using Bartlett's test indicates that the variables included under the factor exhibit a statistically significant association ( $p < 0.05$ ,  $\chi^2 = 0.00$ ). The factor loading coefficient, a quantitative measure used in statistical analysis, is utilized to assess the extent of the association between two variables. All seven loadings for the variables exceeded the established threshold value of 0.60. Yu et al. (2013) assert that loading factors deemed appropriate are those that meet or exceed a threshold of 0.50. Upon completion of the data collection procedure, the subsequent phase included the computation of the mean values for each multivariate construct..

Table 2: Scale of factors and test parameters in exploratory factor analysis (EFA)

Items	Factors							
	F1	F2	F3	F4	F5	F6	F7	F8
IEM1	0.841							
IEM3	0.769							
IEM2	0.759							
IEM4	0.680							
GP3		0.876						
GP4		0.874						
GP2		0.854						
GP1		0.851						
GP5		0.846						
GM3			0.861					
GM2			0.767					
GM1			0.752					
GD5				0.890				
GD4				0.859				
GD3				0.843				
GD2				0.834				
GD1				0.805				
EE2					0.843			
EE3					0.816			
EE1					0.815			
ENP4						0.812		
ENP1						0.799		

ENP3	0.788
ENP2	0.751
ENP5	0.684
<hr/>	
Parameters of test	
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Kaiser-Meyer-Olkin (KMO)	0.873
Cumulative % (Initial Eigenvalues)	72.486%
Bartlett's Test of Sphericity (Sig.)	0.000
Initial Eigenvalue	1.042

*Source: Field survey data, 2023*

The methodologies suggested by Khan et al. (2020) were used in this study to conduct the validity evaluations of the different measures. If the calculated average variance (AVE) exhibits a lower r-squared value in comparison to the observed correlation between any two concepts, then the technique may be deemed effective. The dataset is shown in its entirety in Table 3. The squaring of the diagonal components is a crucial step in the computation of the average extracted variance, often denoted as AVE. Upon analyzing the data along the diagonal of the matrix, it was seen that the square root of the extracted average variance (AVE) reached its minimum value of 0.659. In addition to considering the significance of the correlation between two variables, it is crucial to acknowledge the significance of the cumulative sum of the diagonal elements. The observed disparity along the diagonal, ranging from the lowest to the greatest correlation values ( $r = 0.571$ ), has the potential to provide valuable insights into the underlying variables contributing to the event under investigation. The idiomatic phrases used in this study have been altered and possess unique characteristics, serving as indicators of diverse worldviews.

Table 3: Discriminant validity

	CR	AVE	MSV	MaxR(H)	EE	GP	GD	IEM	GM
EE	0.784	0.579	0.358	0.908	0.761				
GP	0.897	0.612	0.358	0.929	0.598	0.782			
GD	0.866	0.576	0.108	0.928	0.228	0.161	0.759		
IEM	0.766	0.434	0.507	0.828	0.382	0.143	0.329	0.659	
GM	0.701	0.456	0.507	0.828	0.336	0.098	0.238	0.571	0.675

*Source: Field survey data, 2023*

The null hypothesis may be rejected based on the obtained p-value of 0.000, which is below the significance level of 0.01. The statistical analysis conducted provides enough evidence to substantiate this conclusion. The study was conducted using the chi-square test, yielding a score of 2,793,800 with 406,793 degrees of freedom. The validity of the study's structural model was assessed by analysis. The model's accuracy is shown by compelling empirical evidence, including a GFI score of 0.900 and an analytical outcome of 0.945, both of which serve to authenticate the underlying notion. The significance of these signals should not be underestimated in any way. The investigators successfully computed a Tucker-Lewis index (TLI) value for the study, which surpassed the predetermined threshold value of 0.900. The obtained value of the Comparative Fit Index (CFI) was 0.983, consistent with the preceding discourse. The numerical figure in question above the threshold of 0.900, which is widely acknowledged as the lowest acceptable criterion. According to the computations, the value of the root mean square approximation error (RMSEA) is below 0.080. Consequently, this investigation has

successfully met the applicable criteria. A study conducted by Hair et al. (2009) yielded findings that support the reliability and validity of the research paradigm. Table 4 you a chance to see the tabulated results.

Table 4: Model fit indicators in SEM

Indicators	Cut-off values	Calculated values	Conclusion
Chi-square	$\leq 2,793.800$	406.793	Fit
df	$\leq 300.000$	258.000	Fit
Chi-square/df	$\leq 5.000$	1.516	Fit
CFI	$\geq 0.900$	0.983	Fit
GFI	$\geq 0.900$	0.945	Fit
TLI	$\geq 0.900$	0.980	Fit
RMSEA	$\leq 0.080$	0.031	Fit

Source: Field survey data, 2023

In order to assess the impact of GSCM on environmental efficiency, this study used regression analysis and computed the correlation coefficient. Table 5 presents an overview of the potential impacts that the adoption of GSCM practices may have on an organization's ability to achieve its environmental performance objectives. The concept of GSCM, sometimes referred to as GSCM, has been shown to provide positive impacts on societal efficiency via several empirical research. This section presents a summary of the many results derived from the research. The first test results indicated a statistically significant association between social performance and internal environment management ( $p < 0.10$ ,  $\beta = 0.143$ ,  $CR = 1.169$ ). A substantial body of statistical evidence indicates a correlation between environmentally conscious consumer behavior and enhanced environmental outcomes ( $\beta = 0.243$ ,  $CR = 4.024$ ,  $p < 0.01$ ). The statistical analysis conducted at a significance threshold of 10% indicates that the H1 and H2 hypotheses, which were jointly selected for inclusion in the interview, exhibit statistical significance. There is a statistically significant correlation between environmental education and green manufacturing ( $\beta = -0.071$ ,  $CR = -0.861$ ,  $P > 0.05$ ), as well as green distribution ( $\beta = -0.148$ ,  $CR = -2.120$ ,  $P < 0.1$ ), and green distribution ( $\beta = -0.081$ ,  $CR = -1.690$ ,  $P < 0.10$ ). Based on the current data, it is not feasible to reject the hypothesis H3 about the implementation of GSCM activity. The regression equation does not provide adequate evidence within the current dataset to support or reject hypotheses H3 and H4, as they are characterized by a negative regression coefficient and a P value is less than 0.10.

Table 5: Final Estimates of the relationship between GSCM and Economic Performance (EP)

Relationship	Estimate $\beta$	S.E	C.R	P-value	Hypothesis	Hypothesis Result
ENP $\leftarrow$ IEM	0.143	0.122	1.169	0.098	H1	Accepted
ENP $\leftarrow$ GP	0.243	0.060	4.024	***	H2	Accepted
ENP $\leftarrow$ GM	-0.071	0.082	-0.861	0.389	H3	Reject
ENP $\leftarrow$ GD	-0.081	0.048	-1.690	0.091	H4	Not accepted
ENP $\leftarrow$ EE	-0.148	0.070	-2.120	0.034	H5	Not accepted

Source: Field survey data, 2023

$$EP = 0.143 IEM + 0.243 GP - 0.081 GD - 0.148 EE \quad (1)$$

This study has proven a correlation between environmentally conscious consumer behavior and the implementation of efficient internal environmental management practices. Multiple studies conducted by Benedict et al. (2022), Febry et al. (2022), and Adnan et al. (2021) have shown that the integration of internal environmental management practices into the context of green supply chain management (GSCM) leads to enhanced environmental performance (ENP). According to Febry et al. (2022), Adnan et al. (2021), and Wisdom et al. (2019), there is a proposition that the implementation of environmentally sustainable procurement practices might contribute to environmental preservation via the mitigation of pollutant emissions. The study results provide empirical data suggesting that organizations might potentially get substantial benefits from the adoption of environmentally responsible procurement practices. The investigations conducted by Le (2020) and Hassan et al. (2016) both arrived at the finding that there is no significant correlation between environmentally conscious purchasing behaviors and enhanced environmental performance.

Conversely, it might be said that the effectiveness of initiatives such as environmental education, sustainable distribution, and eco-friendly production remains a subject of contention. These initiatives aim to enhance environmental performance by mitigating the adverse impacts of human activities on the environment. The investigation's conclusions included evidence that contradicted the previously accepted views. Numerous academic research have shown that the implementation of environmentally responsible industrial practices has positive effects on environmental performance. The area of study has been significantly advanced by the research undertaken by Febry et al. (2022), Adnan et al. (2021), Le (2020), Wisdom et al. (2019), Ardian et al. (2018), and Sezen and Cankaya (2013), among other researchers. The existing evidence pertaining to the effects of ecologically sustainable manufacturing shows a lack of consistency. Hence, it can be inferred that the incorporation of process optimization and the adoption of sustainable manufacturing techniques not only provide ecological benefits but also offer financial advantages to companies that use environmentally conscious strategies. The ecological and economical benefits of process optimization and the implementation of healthy manufacturing practices are significant factors contributing to their advantages. Nevertheless, the correlation between the Environmental Nurturing Potential (ENP) and plant cover was found to be quite poor. The results presented by Febry et al. (2022) are corroborated by the data presented in this study.

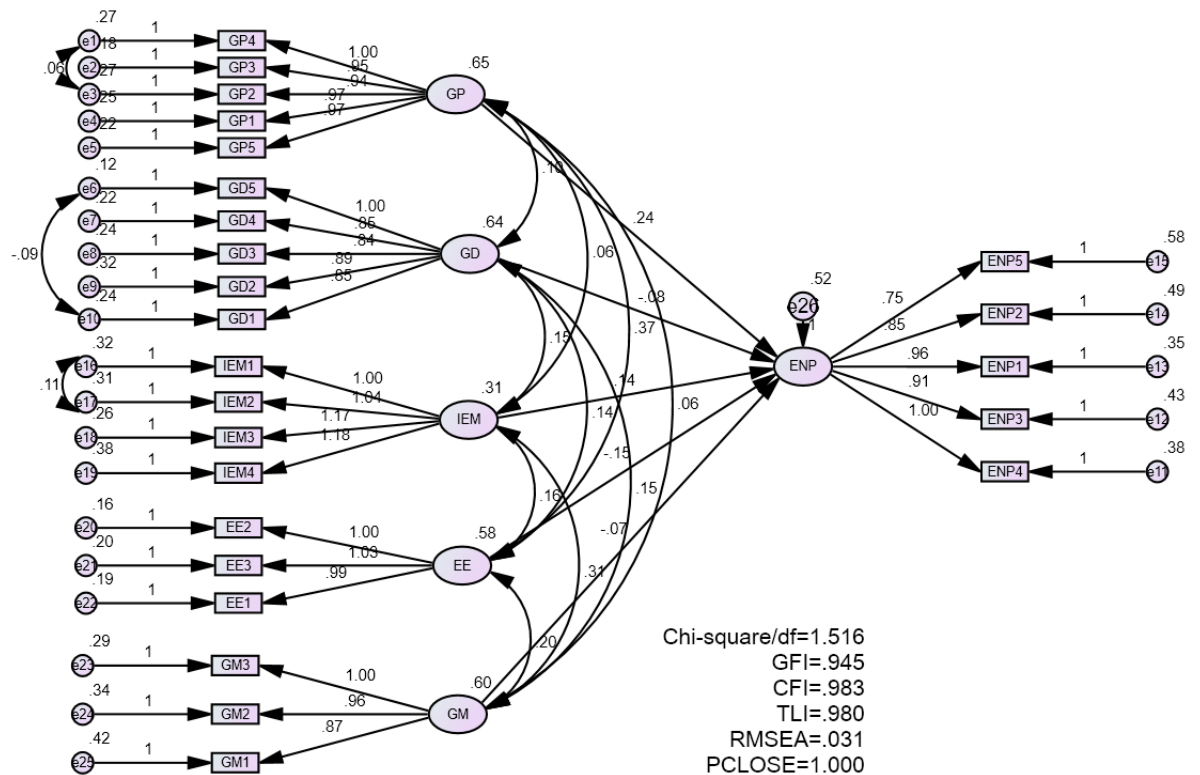


Figure 1: Model SEM of impact of GSCM on environmental performance

#### 4. CONCLUSION

The authors of this research have revealed new insights on the potential impact of environmental responsibility throughout the supply chain on sustainability performance indicators. The findings of this study contribute to the existing academic literature by demonstrating the relevance of both forms of sustainable performance evaluations within a framework that prioritizes environmentally sustainable goods. It is essential to promote active advocacy among economics students in favor of the advancement of sustainable consumption patterns. Due to their specialized knowledge and competence in the sector, students pursuing a degree in economics has a notable edge over their peers when it comes to their ability to conceptualize and evaluate issues pertaining to environmentally sustainable consumption. This phenomenon might be attributed to the extensive historical background of economics students in the study of these subjects. There are many plausible rationales for this phenomenon, among which is the increasing recognition of economics as a reputable discipline inside academia. Consequently, individuals are increasingly recognizing the need to advocate for comprehensive sustainable development. One potential strategy for identifying potential clients is focusing on individuals who have obtained academic qualifications in the field of economics. This phenomenon may be attributed to the fact that individuals who possess a background in economics are more inclined to have a significant impact not only on their own consumption behaviors but also on the consumption behaviors of those within their immediate social networks. The below statement provides a rationale for the obligatory inclusion of environmentally aware consumerism themes inside economics departments. This pedagogical approach has the capacity to augment the quantity of individuals that partake in environmentally conscious consumption within subsequent circumstances,

hence yielding advantageous outcomes for the environment. Given the prevailing circumstances, it is crucial to provide economics students with a comprehensive understanding of ecological consumption.

The main objectives of this research are on the advancement of ecologically sustainable supply chains and the evaluation of firms' social performance. The members of this group possess an inherent proclivity for altruism and exhibit adeptness in collaborative efforts, as they strive to further the principles of sustainable development. It is advisable for enterprises to proactively promote student engagement as a strategic approach for cultivating a robust supply chain, rather than relying only on students' autonomous contributions. This phenomenon arises due to the inherent unpredictability of independent contributions made by pupils. An essential demonstration of a company's dedication to promoting positive social outcomes is the implementation of ecologically sustainable manufacturing practices, with the incorporation of environmental management principles across all aspects of its operations. The level of familiarity that students possess about the green supply chain and social performance has diverse implications for their consumer behavior, career aspirations, and political engagement. The topic has immense importance and offers several benefits in terms of enriching students' understanding of sustainable practices, circular economies, and environmental performance.

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