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Integrating Green Practices and Environmental Performance; Evidence from Nigeria's SME Sector

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ABSTRACT

This study analysed the elements contributing to integrating green practices and environmental performance within Nigeria's wholesale/retail and warehousing/storage sectors. Meanwhile, the target respondents consist of selected SMEs owners and managers operating in the south-west of Nigeria who know how customers behave in relation to external green supply chains, green purchasing, customer integration, and environmental performance. To measure all the variables, validated items were adapted from prior studies. Thus, 164 copies of questionnaires were retrieved from the selected managers/owners of SMEs after testing for the validity and reliability of instruments through a pilot study. The relationship between the external green supply chain and Environmental Performance was the only direct hypothesis not supported by this investigation. Specifically, A significant relationship exists between customer integration, green purchasing, and environmental performance. This study adds to the body of knowledge by demonstrating how various aspects of green practices trigger customer integration and green purchasing factors in developing nations like Nigeria. As such, it advances the understanding of the topic by illuminating how policy frameworks are developed to encourage SMEs to adopt green practices. This study will enable SMEs in developing countries to embrace green practices by transferring eco-friendly technology that can speed their integration of green practices that lack ICT skills and infrastructure. Partnerships with multinational corporations, research institutions, and international organisations can facilitate this knowledge exchange.

1. INTRODUCTION

Increasing global competition has led businesses to take a more methodical approach to Supply Chain Integration (SCI), which has led them to re-evaluate cooperative supply partnerships based on mutual benefit and joint process improvement [1, 2].

Modern governments, communities, and businesses recognise environmental deterioration as a major issue [3]. According to Shen et al. [4], manufacturers are largely responsible for this global issue. As resources are depleted and environmental difficulties increase, manufacturers in developing nations are under pressure from the rest of the world to promote Green Supply Chains (GSC) to improve their environmental and economic performance [5, 6]. In preference of managing interdependent processes, information, and knowledge to meet goals, Supply Chain Management research has mostly neglected interactions between multiple parties [7, 8].

Coordination between SC providers and consumers gives the flexibility needed for gradual development. Effective transportation and development of new product collaboration in response to rapid market changes can improve operational performance, waste reduction, and resource efficiency [9]. Conversely, inefficient supply chains can harm the environment by increasing inventory costs, delivery delays, transportation expenses, customer service, and loss and damage [10, 11]. Which may reduce corporate efficiency.

Integrating environmental management techniques into supply chains is a more public approach to solving this challenge [6, 12]. Businesses must strengthen their sustainability efforts to better coordinate with their suppliers' green initiatives and meet their suppliers' and consumers' sustainability demands for a greener SC and sustainable competitive edge [2, 13]. To achieve their environmental goals faster, Green Supply Chain Management (GSCM) promotes firms to design and develop items in close collaboration with their direct customers, end users, and suppliers [9].

The benefits of green practices for corporate success are well acknowledged [2, 14-16], but more study is needed. There is no consensus on the best strategy to implement green practices with suppliers and consumers. Environmental factors are either considered or treated as independent variables in supplier-customer integration measures [7, 12]. Since the SC system has numerous participants interacting to achieve logistical and strategic goals, processes observing these behaviours independently limit integration.

The incorporation of green practices in Nigerian SMEs is an opportunity. The National Solid Waste Policy (NSWP) of 2021 makes manufacturers, importers, distributors, traders, citizens, and management service owners jointly responsible

for waste generation. This sets the stage for studying the company's green practices.

People seek a balance between economic progress and environmental damage. Many SMEs make eco-friendly products, which grow. Using natural raw materials and eco-friendly manufacturing processes makes the product green. Balin and Sari [17] found that SMEs prioritize environmental management. Dwindling supplies need firm executives to consider sustainability in their supply chain strategy [17]. By focusing on environmental and social issues, operations, support, and information may be managed to create a sustainable supply chain that benefits everyone [5].

As the global economy has risen rapidly in recent decades. Still, society prioritizes economic expansion over environmental protection. This is worsening in developing countries like Nigeria due to slow natural resource depletion and environmental issues [13]. Natural resource depletion can be mitigated via green supply chain integration.

The literature on these topics is vast, but it needs to be unified. The need to improve control over direct and indirect ecologically significant business relationships along the value chain is becoming more apparent to SMEs. A specific stream of literature on GSCM has emerged due to researchers' and industry experts' efforts to understand green supply chain management dynamics [18].

A new concept of green supply chain integration helps describe the transition from purchasing managers to supply chain managers. It's gotten equal scholarly attention. In "green supply chain integration," supply chain managers take on many tasks to break down departmental barriers and improve cross-departmental communication.

Many studies suggest that combining the efforts of supply chain, marketing, operations, finance, logistics, and environmental experts can boost productivity and success in today's dynamic, competitive markets [19, 20]. GSCM professionals frequently view green supply chain integration as a best practice. This implies that positive biases may lead people to believe that emulating trendy green supply chain integration will improve green performance.

Despite the number of studies investigating the adoption and implementation of green practices in developed nations, this line of research is still in its infancy for developing nations such as Nigeria. This is due to cultural differences, poor enabling environment, and varying degrees of economic development. There have not been nearly enough studies conducted on green practices integration and implementation, only a few and scanty were conducted especially on SMEs operations and performance in Nigeria. More specifically, it is a relatively recent issue in the Nigerian SMEs sector which this study has thoroughly addressed and by extension has greatly focused on the environmental performance of SMEs and sustainability.

Instead, recent studies on corporate culture and GSCM practises suggesting that SC integration should be tailored to specific organisational characteristics and green efforts [21, 22]. The following part will review prior research to create hypotheses for the current study. The hypothesis will examine the relationships between GSC integration, GSCM practices, Green Procurement, and customer collaboration.

1.1 Objectives of the study

Green practices" in the context of Nigerian SMEs refer to environmentally sustainable and socially responsible business strategies aimed at reducing negative impacts on the environment while promoting economic growth. These practices are essential for addressing environmental challenges and fostering long-term business resilience which is peculiar to the SMEs sector. Green practices encompass various facets of the business, including procurement, manufacturing, packaging, logistics and the final delivery of products to end-users. This comprehensive approach recognizes that the delivery process is an integral component of GSCM. Therefore, the primary goal of green practices is to minimise or lessen waste that is connected to the supply chain processes which include but are not limited to energy, chemicals, emissions, and solid waste. This study evaluates how green practices integrate into Nigerian SMEs' environmental performance. Specifically, to:

(1) Evaluate the impact of green procurement on the environmental performance of SMEs in Nigeria.

(2) Evaluate the impact of customer cooperation on the environmental performance of SMEs in Nigeria.

This study considered wholesale/retail trade and transport/storage sectors that are mostly relevant to green supply chain management in developing countries including Nigeria. SMEs owners are overwhelmingly represented in the wholesale and retail commerce, storage and transportation industries in Nigeria. According to the National Bureau of Statistics' SMEs Report [23], which provides supporting evidence for this report. As a result, the environmental impacts of these businesses are felt keenly by the entire community. However, the SMEs operators in Nigeria have considered the chosen sectors as their soft target area for green supply chain management practices. According to the National Bureau of Statistics in the year 2021, SMEs in wholesale/retail trade accounted for 135,719 (small enterprises 131,744 and medium enterprises 3,975), while SMEs business in storage and transport amounted to 10,262 (small enterprises 8,798 and medium enterprises 1,464).

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 Supply chain integration and green practices

Complex GSCM cannot be fully described in one explanation [24]. According to Srivastava [25], GSCM is a set of practices that improve environmental performance across a product's supply chain. This definition includes all stages of a product's life cycle, from conception to production, distribution to consumption, disposal, or termination. GSCM is a revolutionary concept that enables firms to establish "win-win" strategies to meet profit and market share goals while decreasing environmental hazards and enhancing ecological efficiency [26]. Recently developed "green supply chain management" (GSCM) considers environmental aspects from inception through disposal [27, 28].

GSCM implementation depends on several factors. A lot of study has been devoted to the question of how widely adopted green supply chain management practices are [29, 30]. Vachon and Klassen [31] noted that the company's GSCM practices affect customer and supplier interactions. Little research exists on how individual drivers affect different behaviours in the supply chain management concept [32].

GSCM acceptance is influenced by SC integration [33]. Integration in the supply chain refers to the strategic

interactions between a manufacturer and its SC partners and the cooperative management of intra- and inter-organizational operations [34]. Literature offers many SC integration models [35], including internal, customer, supplier, technology, and others. Nonetheless, most research agrees on a definition of SC integration that distinguishes between three levels: internal, customer, and supplier integration [36]. SC integration can include technology integration to help suppliers and clients share information and knowledge [31].

Sustainable supply chain management manages all SC material and data movements for the growing demand for eco-friendly goods and services. Environmental integration requires SC members to work together on pollution control and waste management [2]. To integrate environmental improvement initiatives, manufacturers, suppliers, and customers must share technical knowledge and understand each other's processes. It requires understanding one's position in environmental management and working together to reduce material flows' environmental impacts in the supply chain.

2.1.1 Brief comparison of how green practices are integrated into SMEs in other countries

Globally, the integration of green practices into SMEs is influenced by various factors, including regulatory frameworks, market dynamics, and the socio-economic context of each country. It is important to note that the situation can vary widely across different countries due to diverse economic, social, and environmental conditions [37].

In China, the government has been playing a significant role in promoting green practices among SMEs. Various policies and initiatives, such as the Green Credit Policy and environmental regulations, encourage businesses to adopt sustainable practices [26]. Additionally, the concept of "eco-industrial parks" has gained popularity, fostering collaboration among SMEs to share resources and reduce environmental impact.

In the USA, SMEs often adopt green practices voluntarily, driven by market demand, consumer preferences, and cost savings. Certification programs like LEED (Leadership in Energy and Environmental Design) are popular, showcasing a commitment to sustainability. Many SMEs in the USA also participate in corporate social responsibility (CSR) initiatives, incorporating green practices into their overall business strategy.

In the United Kingdom, SMEs are influenced by both government policies and market forces. The UK government has set ambitious targets for reducing carbon emissions, and SMEs are encouraged to adopt sustainable practices through various incentives and support programs [38]. Moreover, consumer awareness and preferences for eco-friendly products and services contribute to SMEs integrating green practices to remain competitive.

Nigeria can learn valuable lessons from other countries that have successfully integrated green practices into SMEs by combining global best practices with locally relevant solutions [39, 40]. Similarly, Nigeria can create a roadmap for sustainable development and the integration of green practices into its SME sector. Conducting comprehensive studies on countries with successful green practices in SMEs through a thorough analysis of the policies, regulations, and incentives that have been effective in promoting sustainability.

2.1.2 The multidimensional nature of green practices

Green practices are multidimensional in nature and cut across all spheres of business activities, these include but are not limited to eco-design, green distribution, reverse logistics, green purchasing/procurement, customer integration, consumer integration, etc [41]. However, the current study only considered green procurement and customer integration as mostly relevant to the study. These variables were extensively discussed in the work and the justification for considering green procurement and customer integration involved the operational activities of many SMEs owners in Nigeria. A large number of SMEs are involved in trading activities.

However, green procurement involves sourcing products and services that have minimal environmental impact. SMEs adopting green procurement practices may find that, in the long run, environmentally friendly practices can lead to cost savings through energy efficiency, waste reduction, and resource conservation. Increasingly, customers are becoming environmentally conscious and are inclined to support businesses that share their values [37]. SMEs that integrate customer feedback and preferences into their procurement strategies may find that adopting green practices helps them meet market demands and attract environmentally aware customers. Customer integration involves gathering feedback and insights from customers. SMEs that actively seek customer input on environmental performance may identify areas for improvement and innovation [42]. This feedback loop can contribute to the continuous enhancement of environmental practices.

2.2 Green procurement

GSCM also includes the process of environmentally friendly purchasing. The purchasing process is the starting point of any value chain. Integrating a company's environmental initiatives, procurement activities, and goals is crucial to the company's performance. Green procurement has the potential to incorporate environmental considerations and issues into the purchasing process [43]. If a business is serious about meeting its environmental goals, it must take care in selecting its suppliers. However, selecting a suitable supplier is not enough to boost its environmental performance.

The concept of "green procurement" pertains to acquiring goods and services in a manner that demonstrates environmental responsibility. The objective is to ensure that businesses' environmental requirements, such as waste reduction, stimulation of recycling, restructuring, resource conservation, and appropriate substitution of substances, are fulfilled by procuring goods and services. According to Khan and Qianli [44], large businesses are more likely than small ones to engage in green-based activities, and these activities help the business advance while simultaneously promoting environmental awareness. Sustainable purchasing gives businesses an advantage, protects their resources, and increases productivity [45]. Implementing green procurement practices has been found to have both direct and indirect positive effects on business performance [46].

2.3 Customer integration

Martinelli and Tunisini [47] investigate the need for customers to be incorporated into supply chains and find that doing so provides a wealth of resources and capabilities. Their work highlighted the importance of customer integration in providing the capabilities and resources necessary to make the

supply chain customer-oriented.

Incorporating customers into supply chain design increases value and competitive advantage [48]. Customisation, specialised capabilities and resources, shared knowledge, and adaptability increase customer integration as a source of skills and resources [49]. The entire supply chain must be able to rearrange resources to adjust to demand and supply changes quickly. Investments in supply chain capabilities like operational flexibility can improve customer attention and outcomes [50].

During alignment, a new operation strategy coordinating many activities should consider indirect capabilities (border management techniques, contracts, interface artefacts, etc.) [12]. Businesses have been attempting to improve their collaboration skills to compete better and take advantage of the different information, materials, technology, processes, and relationship management expertise available throughout their supply chains. Combining different and complementary talents to achieve typical results has proven difficult. Successful collaboration gives companies an edge [51]. Customer focus and reduced supplier lead time improve mass customisation capabilities. Therefore, the supply chain should collaborate with customers [52, 35]. Significant results include effective supply chain partner management. An adequate supply chain involves the customers in its activities, works with the supplier, and shares essential information quickly to suit customer needs [53]. Customer integration requires collaboration [54, 55] because it enables the supply chain to be geared toward a customer-driven strategy and this is done through trust and cooperation.

Trust in this context means confidence in one's partners, openness to sharing personal and professional information and knowledge and establishing collaborative teams. Collaborative planning and the centralisation of processes can increase traders' level of trust in one another [56].

2.4 Green supply chain integration and environmental performance

The adoption of Green Supply Chain Management (GSCM) practices is driven by the need for organisations to enhance their competitiveness and environmental performance. This is in response to the increasing need for environmentally responsible practices across corporations and various levels of production chains. The preservation of natural resources and the decrease in global warming and carbon emissions are just two of the many environmental benefits resulting from the widespread implementation of Green Supply Chain Integration [28, 50].

GSCM entails regulating material flow throughout several value chain phases, encompassing acquisition, manufacturing, and distribution [57]. According to Vachon and Klassen [31], GSCM practices can be seen as a collection of cooperative endeavours between different organisations that result from two strategies for better environmental management: joint efforts to solve problems and reduce risks. It is possible to divide GSCM procedures indoors and outside.

Internal GSCM techniques include things like environmental management, eco-design, and investment recovery that are carried out within a company but do not include the direct participation of suppliers or customers. Green purchasing and customer integration are just two examples of the external GSCM processes that entail interactions with the company's supply chain and its clients [51]. The lack of empirical evidence establishing a conclusive link between the adoption of Green Supply Chain Management (GSCM) and the improvement of environmental performance poses a challenge for small and medium-sized firms (SMEs) aiming to incorporate GSCM practices [41].

The impact of extraneous GSCM has been the topic of conflicting research findings. Despite widespread agreement that GSCM integration from the outside can impact environmental performance, research has yielded inconsistent outcomes [37]. Also, most research deals with GSCM practices or external GSCM practices in a general sense. That is to say, neither of them focuses on how green purchase (GP) and environmental performance (EP) relate to customer integration (CI) and environmental performance (EP) separately [42, 58-63]. Previous authors have investigated the links between specific external GSCM practices and environmental performance and found that CI and GP benefit EP. Although GP and CI are statistically significant, only one study has shown this to be the case [42]. We can, therefore confirm the study's hypothesis.

H1*: External green supply chain integration positively influences the environmental performance of SMEs in Nigeria*

2.5 Green purchasing and environmental performance

According to the GSCM literature, consumers play a crucial role in driving innovation in response to shifting consumption norms and regulations, ultimately leading to better environmental performance [64-67]. The level to which a company engages in "Green Purchasing" activities is a good proxy for how its consumers impact the business [68, 69]. While some works focus on the CI viewpoint, they need to investigate the importance of the client in integration.

Moreover, in a context characterised by intense competition, if a small enterprise can establish a strong partnership with its customers to mitigate the adverse environmental effects resulting from its distribution logistics operations, it will experience enhanced performance levels [70]. Lai et al. [71] argue that in a regulatory setting where extended accountability is suggested, consumer participation in product return, recycling, and final disposal is essential to the effectiveness of extended responsibility policies. Customers' perceptions of accountability in product development initiatives may determine how much responsibility is extended. A group of Spanish businesses were examined by Junquera et al. [72]. They found that green competitive advantage was bolstered when companies paid attention to their customers' environmental concerns and worked closely with them. Therefore, the second hypothesis of this research is:

H2: *Green purchasing will positively influence the environmental performance of SMEs in Nigeria*

2.6 Customer integration positively influences environmental performance

A customer receives or uses a product and can select from various vendors. Merchandisers, retailers, wholesalers, internet merchants, and end customers are considered customers within the purview of the supply chain [73]. According to scholarly literature, customer integration can be defined as the collaborative efforts between a central firm and its clients to incorporate environmental factors that promote customer sustainability [31]. It looks at the supply chain from

the end, where sales are made downstream. Levels of customer integration in green supply chain techniques for environmental management, planning, and solution discovery of ecological challenges are discussed [74]. Moktadir et al. [38] stressed the significance of customer involvement in improving business outcomes. Successful prospects for companies to engage in environmental integration with their clientele have been identified by Epstein et al. [75].

Great customers are one way to take advantage of these possibilities. One of these openings to successfully apply environmental policies is building a solid long-term relationship with customers [24, 54, 38]. It has been established that customer demand is the primary motivator for the manufacturer to enhance their environmental behaviour and image. However, knowing what your customers want is crucial to success in the value creation game. Organisations are under increasing consumer pressure to engage in environmental planning and meet common ecological objectives.

According to a Green Brand Survey, clients in an industrialised country are more eager to work with manufacturers to achieve environmental goals. Sriyabhand [76] found that consumers are more likely to make purchases from eco-friendly businesses. Research demonstrates that eco-conscious consumers use spending decisions as a yardstick of a service's or product's commitment to sustainability.

These occurrences may influence an organisation's economic, environmental, and social sustainability. It is also discovered that a company's economic performance and competitive advantage over other firms are primarily determined by the degree to which they collaborate with their customers [39]. Manufacturers must identify the product aspects relevant to the green idea before launching a new product, making customer input essential [77].

In addition, Das and Hassan [40] emphasised the importance of the dialogue between producers and consumers in fostering long-term success for businesses. Similarly, Jermsittiparsert et al. [78] found a favourable correlation between the degree of customer collaboration and enterprises' environmental and social sustainability performance. Thus, this hypothesis was further proposed:

H3: Customer integration positively influences the environmental performance of SMEs in Nigeria

3. RESEARCH MATERIALS AND METHODS

This study intends to examine the causal relationship between variables by determining the research hypotheses. This study explained respondent perception due to the connection between green practices integration and environmental performance. Meanwhile, the target respondents consist of selected SMEs owners and managers domiciled in south-west Nigeria who experience customers' behaviour towards external green supply chains, green purchasing, customer integration and environmental performance. This study only considered wholesale/retail trade and transport/storage sectors that are mostly relevant to green supply chain management in developing countries including Nigeria. The reason being that the SMEs in the south-west are the soft target of the green supply chain management and commercial hub of Nigeria, especially Lagos state [23]. To measure all the variables, validated items were adapted from prior studies in which all variables amounted to 22 items. Specifically, the external green supply chain was measured with five (5) items adapted [37, 42]. Green purchasing was assessed with four (4) items adapted from [17, 68]. Customer integration with seven (7) items [39, 40, 73, 75]. Environmental performance with six (6) items [37, 41, 42] as indicated in Table 1.

Table 1. Variables measurement with sources

Constructs	Items	Sources
External Green Supply Chain Integration	5	Zhu et al. [51] Zailani et al. [37] Yang et al. [42]
Green Purchasing	4	Balin & Sari [17] Lai et al. [71]
Customer Integration	7	Abidin et al. [73] Epstein et al. [75] Negri et al. [39]
Environmental Performance	6	Zailani et al. [37] Yang et al. [42]

All items used five points Likert scale ranging from strongly disagree (SD=1) to strongly agree (SA=5). Thus, 164 copies of questionnaires were retrieved from the selected managers/owners of SMEs after testing for the validity and reliability of instruments through a pilot study. That is, after the validation of the instrument by the expert in the academic and industry, 30 copies of questionnaires were distributed to confirm the cronbach alpha (reliability) KMO (validity test). The result indicates that all instruments are suitable to measure the proposed variable. Data collected were codified into the SPSS version 25 for further analysis on descriptive and inferential analysis. The descriptive analysis was used to examine the demographical profile of the respondents, average mean gaps and correlation analysis between the variables. While inferential statistics was used to reach conclusions from the data collected via structural equation modelling (SEM). SEM is a multivariate statistical technique that allows the testing of a series of causal relationships between variables to provide statistical efficiency that can be measured directly in the research process [79].

4. DATA ANALYSIS AND DISCUSSION OF FINDINGS

This study analyzed the relationship between external green supply chain, green purchasing, customer integration and environmental performance of the selected SMEs owners and managers in south-west Nigeria. The study analysed the data collected from the respondents and commenced with the codification of the data collected into statistical packages of social sciences (SPSS 25 version). Furthermore, the analysis used is classified into descriptive statistics and inferential statistics. The descriptive statistics included the demographical information and normality test of the data collected (via SPSS). Whereas the inferential statistics include the measurement model and structural model (via PLS-SEM) as explained in the sub-section below:

4.1 Descriptive statistics (Mean, standard deviation, and normality test)

This was used to determine the normality of the questionnaires, the respondents' means and standard deviations, mean gaps in the external green supply chain,

green purchasing, customer integration, and environmental performance, where mean and standard deviation were regarded as descriptive statistics for ratio and interval scale. Based on the findings [80], it has been determined that response rates of 2.33 and below can be classified as low-level, while response rates ranging from 2.34 to 3.66 are considered moderate. Response rates of 3.67 and above are categorised as high-level. The data presented in Table 2 demonstrates that environmental performance has the greatest average mean value, with a mean of 4.04 and a standard deviation of 1.025. In contrast, the external green supply chain is considered to have the lowest average mean value, with a mean of 3.91 and a standard deviation of 0.790, as depicted in Table 2.

Table 2. Descriptive statistics and normality test (Mean, SD, skewness & kurtosis)

Constructs	N	Mean	SD	Skewness	Kurtosis
EGS	164	3.909	.790	-1.212	1.861
GP	164	3.973	.831	-1.491	1.295
EP	164	4.043	.824	-1.614	1.904
CI	164	3.942	.936	-1.504	1.437

Note: External Green Supply (EGS); Green Purchasing (GP); Environmental Performance (EP); Customer Integration (CI)

According to the normality test, skewness and kurtosis are the fundamental statistical measures used to assess normality. For a distribution to be deemed normal, skewness and kurtosis values must be close to zero (0). According to the findings of Tabaniche and Fidel [81], skewness and kurtosis are recommended to fall within the range of ±2.58 for a large sample size. However, an alternative perspective presented by [79] suggests that the acceptable range for both values is ±1. The findings in Table 2 indicate that the data has a normal distribution, as seen by the skewness and kurtosis values falling within an acceptable range.

4.2 Correlation analysis

Correlation analysis is a statistical method used to assess the degree and direction of the relationship between variables. Pallant [82] asserts that a zero correlation coefficient signifies the absence of a relationship, whereas a correlation coefficient of one (±1) implies a strong positive or negative relationship. However, a correlation coefficient greater than 0.9 shows the presence of multicollinearity.

Table 3. Correlation analysis

Constructs	EGS	GP	EP	CI
External Green Supply (EGS)	1			
Green Purchasing (GP)	.412**	1		
Environmental Performance (EP)	.446**	.321**	1	
Customer Integration (CI)	.500**	.600**	.477**	1

Note: External Green Supply (EGS); Green Purchasing (GP); Environmental Performance (EP); Customer Integration (CI)

Hence, the findings presented in Table 3 indicate that the correlation analysis conducted on the variables yielded statistically significant results at a significance level of 0.05 (p=0.000), with no evidence of multicollinearity.

4.3 Measurement model

To ascertain the testing of the hypotheses, it is important to test the validity and reliability of the measurement model during the initial stages. According to Hair et al. [79], validity is made up of convergent validity and discriminant validity, whilst reliability is explained as the interior conformity that is scaled by the coefficient of composite reliability. According to Nik Muhammad et al. [80], it is recommended that the composite reliability coefficient of latent constructs should exceed 0.70, which is the minimum threshold. This indicates that each construct exhibits satisfactory internal consistency. In addition, it is imperative that the factor loading for the measurement index surpasses the minimum critical value of 0.60. AVE, however, needs to be higher than 0.5. This suggested that the constructs had strong convergent validity that is relevant. Chin [83] posited that to establish discriminant validity, it is necessary to ascertain whether there exists a statistically significant distinction among the variables under consideration. Therefore, the square root of each AVE of the model's constructs should be bigger than the appropriate coefficient of this variable. Hence, the utilisation of different constructs' validity and reliability can be employed for subsequent hypothesis testing (Figure 1). The measurement model for this study is summarised in Table 4.

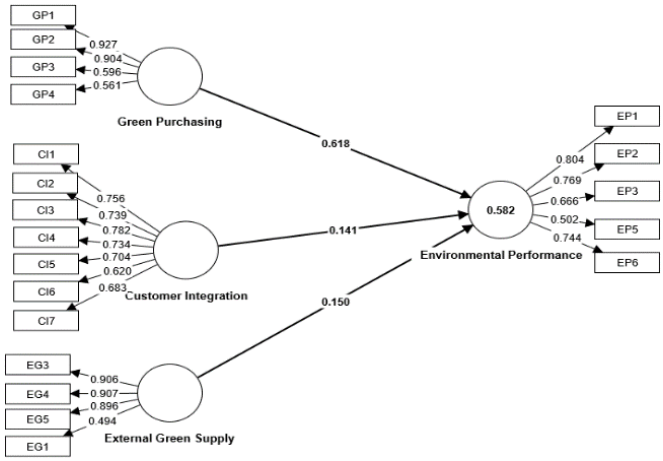


Figure 1. Measurement model

Table 4. Summary of measurement model (Reliability and convergence validity)

Constructs	Items	Loadings	C.Alpha	CR	AVE
CI	CI1	0.756	0.843	0.881	0.516
	CI2	0.739			
	CI3	0.782			
	CI4	0.734			
	CI5	0.704			
	CI6	0.620			
	CI7	0.683			
EGS	EG1	0.494	0.788	0.829	0.497
	EG3	0.906			
	EG4	0.907			
	EG5	0.896			
PE	EP1	0.804	0.815	0.887	0.673
	EP2	0.769			
	EP3	0.666			
	EP5	0.502			
	EP6	0.744			
GP	GP1	0.927	0.758	0.844	0.586
	GP2	0.904			
	GP3	0.596			
	GP4	0.561			

Note: *External Green Supply (EGS); Green Purchasing (GP); Environmental Performance (EP); Customer Integration (CI)*

4.4 Discriminant validity

This shows the extent to which constructs are different from each other as reported by Ab Hamid et al. [84]. Thus, the Heterotrait-monotrait ratio (HTMT) was used to calculate the discriminant validity because of its high sensitivity in detecting correlation issues [85]. The rule of thumb value for HTMT is 0.9. That is, if the HTMT value is below 0.9, it shows no correlation problem. Thus, HTMT values in this study (0.410 - 0.861) are acceptable as recommended by Henseler et al. [86]. As seen in Table 5 below.

Table 5. Discriminant validity (Heterotrait-monotrait ratio (HTMT) result)

Constructs	CI	EGS	EP	GP
Customer Integration				
External Green Supply Chain	0.410			
Environmental Performance	0.862	0.404		
Green Purchasing	0.741	0.591	0.701	

4.5 Structural model (Testing of hypotheses)

This study analyzed the overall structural model and hypotheses testing which the R^2 of the environmental performance is 0.582. Hence, the constructs have all been explained and the model constructed has substantially strong explanatory power. The path coefficient of the model structure adopted the significant hypothesis test of bootstrapping of 5000 with the standardized path coefficient, t-value and the hypothesis test. Thus, Figure 2 and Table 6 show the result of the structural model of the study.

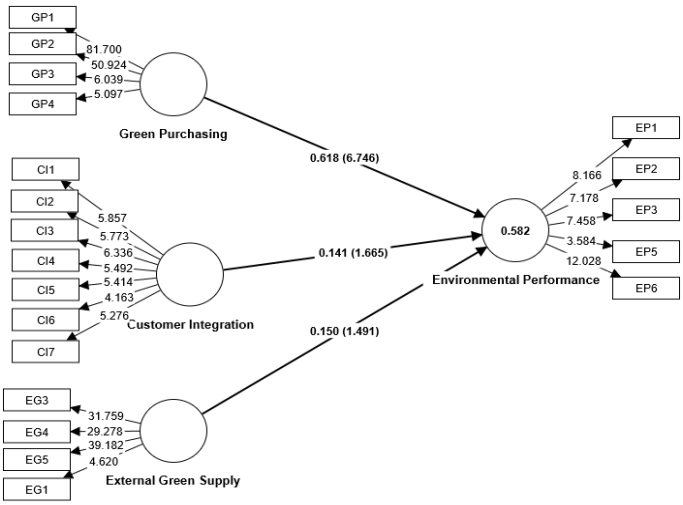


Figure 2. Structural model (Bootstrapping @5000)

Table 6. The result of the structural model

Hypotheses	Beta	Se	T value	P values	Lower 2.5%	Upper 97.5%
CI -> EP	0.141	0.085	1.665	0.096	0.041	0.228
GP -> EP	0.618	0.092	6.746	0.000	0.122	0.407
EGS -> EP	0.150	0.100	1.491	0.136	-0.194	0.553

Note: *EGS - External Green Supply Chain; GP - Green Purchasing; CI - Customer Integration; EP - Environmental Performance*

The result from Table 6 above indicates that two out of the three direct hypotheses were supported, whereas only one direct hypothesis which is the relationship between external green supply chain and Environmental Performance was not supported. Specifically, customer integration has a significant relationship with environmental performance (T=1.67; p=.096). Hence, the hypothesis (H_1) was supported. In addition, the relationship between green purchasing and environmental performance is significant (T=6.75; p=.000). Hence, the hypothesis (H_2) was supported. However, the external green supply chain has an insignificant relationship with Environmental Performance (T=1.49; p=.136). Thus, hypothesis (H_3) was not supported.

This is in line with the prior studies whereby it was mentioned that various environmental factors such as customer pressure, green purchasing, external green supply, and competitor pressure have a significant impact on the environmental performance among SMEs [87-92]. According to Lin et al. [88] and Tiwari [93], environmental factors are the elements of a company's physical, social, and mental surroundings in which the firm lives and operates as it is broken down into three categories: physical, social, and mental. As revealed by Kinuthia [92], organizations that use information technology can change the rules of competition by altering the rules of the industry as well as be able to outperform their competitors, thus creating an environmental performance. Although, external green supply was not significantly related to environmental performance which is contradictory to the agency theory and institutional theory.

5. CONCLUSIONS AND RECOMMENDATIONS

This study focuses onintegrating green practices into the environmental performance of Small and Medium Enterprises (SMEs) in Nigeria and this represents a crucial step towards achieving sustainable development and mitigating the adverse impacts of industrial activities on the environment. This study has highlighted several key findings that underscore the importance and feasibility of such integration while shedding light on the challenges that must be addressed to ensure successful implementation.

The evidence presented in this study demonstrates that integrating green practices into the environmental performance of Nigerian SMEs can yield numerous benefits. These benefits include reduced resource consumption, improved energy efficiency, cost savings through waste reduction and recycling, enhanced brand reputation through eco-friendly initiatives, and alignment with global sustainability standards. Moreover, the study emphasizes that embracing green practices can contribute to long-term resilience against regulatory changes and market demands increasingly favouring environmentally responsible businesses.

However, the journey towards successfully integrating green practices into SMEs' environmental performance is not without obstacles. Significant challenges include limited access to finance, inadequate technological resources, lack of awareness and knowledge, and the absence of supportive policies. Overcoming these barriers requires a multifaceted approach involving collaboration between government bodies, financial institutions, industry associations, and environmental NGOs. Accessible financing options, technical assistance programs, capacity-building workshops, and policy incentives must be established to empower SMEs to adopt and sustain green practices.

Based on the findings of this study, several recommendations are put forth to guide the integration of

green practices into the environmental performance of Nigerian SMEs:

Government Support: Government agencies should develop and implement policies incentivising green practices, such as tax incentives, grants, and preferential procurement for eco-friendly products and services. Strengthening regulatory frameworks encouraging environmental compliance and certification can also drive positive change.

Technology Transfer: Facilitating the transfer of eco-friendly technologies to SMEs can accelerate their adoption of green practices. Partnerships with multinational corporations, research institutions, and international organisations can facilitate this knowledge exchange.

Collaborative Platforms: Creating platforms for SMEs to share best practices, challenges, and success stories can foster community and enable mutual learning. Industry-specific networks and online forums can serve as valuable resources.

In essence, integrating green practices into the environmental performance of Nigerian SMEs is a critical endeavour that requires collective commitment from the government, businesses, civil society, and financial institutions. By addressing the challenges and implementing the recommendations outlined in this study, Nigeria's SME sector can contribute significantly to the nation's sustainable development goals while also playing a pivotal role in global efforts to combat climate change and environmental degradation.

The successful establishment of a green supply chain is characterized as being predicated on the incorporation and configuration of environmentally friendly business practices with initiatives for the enhancement of organizational performance. On the recommendation notes, the present study recommends comparative research between Nigeria and other developing economies in Africa that may give insight and enable the comparative countries to examine areas of strength and weaknesses. Methodologically, the study suggests the adoption of the latest software for data analysis in the future research study.

With regard to the limitations of the study, despite its contribution to the existing body of knowledge, this study is not exempted from some limitations. This study only considered 164 primary data due to the low response rate from target respondents; it suggests that more complex data should be tested to clarify the influence of green supply chain integration on the environmental performance of SMEs in Nigeria. Furthermore, future studies should consider other countries/sectors beyond the wholesale/warehousing SMEs sector for the generalization of the study. Finally, the study only considered the quantitative primary research method, further studies may consider the qualitative or mixed methods for generalization of the study.

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