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GREEN PROCUREMENT PRACTICES AND ENVIRONMENTAL PERFORMANCE: EVIDENCE FROM QUOTED INDUSTRIAL GOODS MANUFACTURING FIRMS IN NIGERIA

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ABSTRACT: *This study explored the relationship between green procurement practices and environmental performance of quoted industrial goods manufacturing firms in Nigeria. This study adopted the correlational research design and quantitative research approach. The population of the study consisted of 12 industrial goods manufacturing firms quoted on the Nigerian Stock Exchange. The sampling unit was made up of procurement managers, production managers, operational managers, innovation managers, and strategic managers of the firms. The census sampling technique was adopted since the population is researchable. A structured questionnaire was used as the main instrument for data collection. The data collected were analyzed statistically while the hypotheses were tested using Spearman Rank Order Correlation Coefficient (rho) and SPSS version 24. The findings revealed that green material procurement has a significant relationship with waste reduction for quoted industrial goods manufacturing firms in Nigeria. The study also found a significant relationship between green material procurement and pollution reduction for quoted industrial goods manufacturing firms in Nigeria. A significant relationship was also reported between green technology procurement and waste reduction for quoted industrial goods manufacturing firms in Nigeria. The study discovered a significant relationship between green technology procurement and pollution reduction of quoted industrial goods manufacturing firms in Nigeria. From the findings, it was concluded that green procurement practices, such as green material procurement and green technology procurement, have a significant relationship with environmental performance of quoted industrial goods manufacturing firms in Nigeria. Therefore, it was recommended that quoted industrial goods manufacturing firms in Nigeria should practice green procurement, as it would improve their environmental performance.*

KEYWORDS: Green procurement practices, green material procurement, green technology procurement, environmental performance, waste reduction, and pollution reduction.

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INTRODUCTION

The increasing environmental problems facing the world today have made it mandatory for industrial firms to find a smart way to improve their environmental performance. Environmental problems such as carbon pollution, excessive waste, depletion of natural resources, deforestation, climate change, and global warming arise as a result of the activities of industrial organizations and unless these organizations improve their environmental performance, the world will continue to experience severe health hazards and complications (Mohammed, 2021). Industrial firms in Nigeria need to improve their environmental performance so that the environmental challenges facing the country will be a thing of the past. Improving environmental performance is necessary for industrial firms to maintain their social contract with society. Industrial firms need to reduce the amount of waste generated, minimize carbon pollution (greenhouse gas emissions), conserve resources, and make the environment clean and safe for the people (Sharma et al., 2022). However, improving environmental performance is not an easy task for industrial firms as it requires these firms to make a lot of sacrifices and practice green procurement to achieve their environmental goals.

Green procurement is an environmentally conscious purchasing initiative that tries to ensure that purchased materials, products, or services meet sustainability goals set by a firm (Kannan et al. in Kipuyo, 2020). It involves sourcing materials, products, energy, and technology from suppliers with strong environmental credentials and ensuring that the procurement processes are resourceful and economically efficient. This type of procurement is consistent with sustainability principles, which emphasize a strong, healthy, and just society. Green procurement goes beyond the traditional procurement that focuses mainly on quality and costs to include a broader concern of pollution reduction, resource conservation, fair labour practices and economic efficiency while making purchasing decisions (Kipkorir & Wanyoike, 2015). The main difference between green procurement and traditional procurement is that traditional procurement prioritizes immediate cost reduction and efficiency, often overlooking risks associated with environmental degradation, regulatory compliance, and labour disputes, while green procurement takes a proactive approach to managing these risks by embedding sustainability criteria into supplier selection and contract negotiation processes (Steen et al. in Habila et al., 2025).

The goal of green procurement is to ensure that purchasing decision of an organization have a positive impact on the environment, economy, and society at large (Gatari & Were, 2014). Haron and Ramakrishnan (2015) opined that green procurement is aimed at minimizing the negative environmental impact of an organization's purchasing decisions and enhances the economic efficiency and sustainability of its supply chain operations. Green procurement supports the purchase of recyclable and reusable materials and products as well as clean energy and technology to meet organizational needs in a cost-effective manner (Gitau & Shalle 2019). This kind of procurement ideology requires firms to incorporate environmental and health concerns into the search and purchase of high-quality materials, energy, technology, products, and services at competitive prices. Ghosh (2018) opined that companies practice green procurement in order to protect the natural environment, improve public health, ensure worker safety and reduce waste and costs. It is against this backdrop that this study examines the relationship between green procurement practices and environmental performance of quoted industrial goods manufacturing firms in Nigeria.

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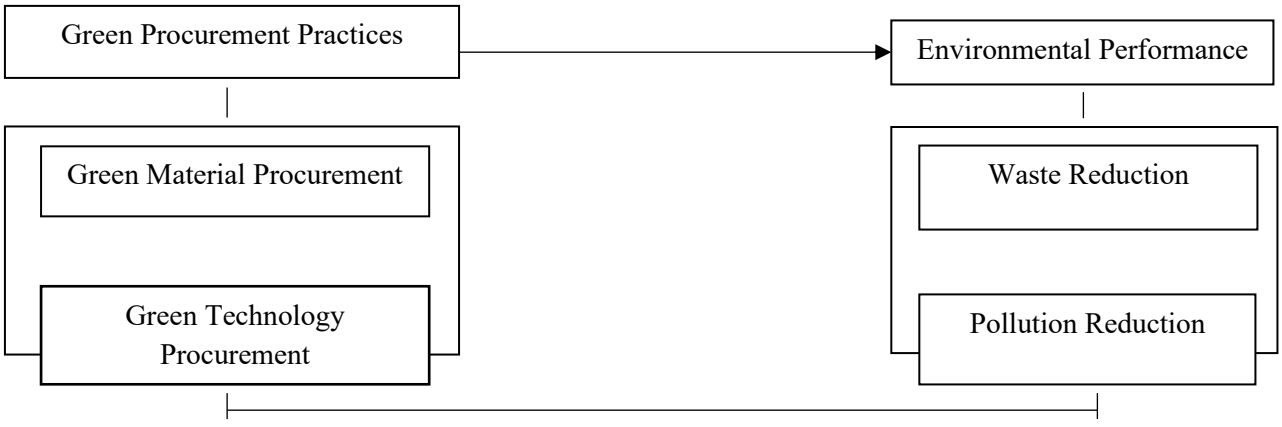
Statement of the Problem

The major problem that promoted this study is the challenges faced by Nigerian firms in improving their environmental performance. The environmental performance of some firms in Nigeria is very low, as they fall short of expectations. Many firms in Nigeria are performing poorly in terms of reducing waste and pollution, thereby resulting in poor environmental performance. Given low the poor environmental performance of firms in Nigeria and its implications on human health and social well-being, it becomes imperative for these firms to practice green procurement in order to improve their environmental performance. There is a strong belief that green procurement practices such as green material procurement and green technology procurement can help industrial firms to improve their environmental performance. Recently, some quoted industrial goods manufacturing firms in Nigeria have embraced green procurement practices as a way of improving their environmental performance. However, ever since these firms adopted green procurement, it is still not clear whether such practices have improved their environmental performance as empirical studies that examined the relationship between green procurement practices and environmental performance of quoted industrial goods manufacturing firms in Nigeria are lacking in literature. This scarcity of research work on this area necessitated this study.

CONCEPTUAL FRAMEWORK

The conceptual framework of green procurement practices and environmental performance of quoted industrial goods manufacturing firms is shown in Figure 1 below:

Fig 1: Conceptual framework of green procurement practices and environmental performance: Evidence from quoted industrial goods manufacturing firms in Nigeria



Source: *Author's Conceptualization*

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Aim and Objectives of the Study

The aim of this study is to examine the relationship between green procurement practices and environmental performance of quoted industrial goods manufacturing firms in Nigeria. To achieve this broad aim, the study intends to:

1. ascertain the relationship between green material procurement and waste reduction of quoted industrial goods manufacturing firms in Nigeria;
2. determine the relationship between green material procurement and pollution reduction of quoted industrial goods manufacturing firms in Nigeria;
3. explore the relationship between green technology procurement and waste reduction of quoted industrial goods manufacturing firms in Nigeria;
4. ascertain the relationship between green technology procurement and pollution reduction of quoted industrial goods manufacturing firms in Nigeria.

Research Questions

The study raised the following research questions to address the above objectives:

1. What is the relationship between green material procurement and waste reduction of quoted industrial goods manufacturing firms in Nigeria?
2. To what extent does green material procurement relate to pollution reduction of quoted industrial goods manufacturing firms in Nigeria?
3. How does green technology procurement relate to waste reduction of quoted industrial goods manufacturing firms in Nigeria?
4. What is the relationship between green technology procurement and pollution reduction of quoted industrial goods manufacturing firms in Nigeria?

Research Hypotheses

The following hypotheses were developed to address the research questions:

Ho_1: There is no significant relationship between green material procurement and waste reduction of quoted industrial goods manufacturing firms in Nigeria.

Ho_2: There is no significant relationship between green material procurement and pollution reduction of quoted industrial goods manufacturing firms in Nigeria.

Ho_3: There is no significant relationship between green technology procurement and waste reduction of quoted industrial goods manufacturing firms in Nigeria.

Ho_4: There is no significant relationship between green technology procurement and pollution reduction of quoted industrial goods manufacturing firms in Nigeria.

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REVIEW OF RELATED LITERATURE

Concept of Green Procurement

Green procurement is the integration of environmental, economic, and social concerns into the purchasing decisions, policies, programmes, and actions of a firm (Kimario et al., 2023). It involves the acquisition of items, assets, materials, energy, technology, and products that have minimal impact on the environment throughout their lifecycle. This type of procurement is consistent with the principles of sustainable development, which emphasize economic efficiency, a healthy environment and just society. Ghosh (2018) described green procurement as the utilization of sustainability standard in the purchasing activities of a company. Such practices involve sourcing raw materials from suppliers with strong environmental credentials, selecting materials, products, and technology that have minimal environmental impact, and ensuring that the procurement processes are resourceful and energy-efficient. Habila et al (2025), states that green procurement is a tool for businesses that are determined to be environmentally responsible and economically conservative. Bolton (2015) opined that green procurement is a pollution-free principle that seeks to decrease hazards to environmental and human health. This type of procurement practice helps firms to reduce their environmental footprint during production processes by purchasing and utilizing raw materials, energy, and technologies that have a lesser environmental impact during production operations. Libuhi (2025) posited that green procurement helps firms to lower greenhouse gas emissions, ensure energy efficiency, and increase resource efficiency.

Dimensions of Green Procurement Practices

Green procurement practices can take different dimensions, such as green material procurement, green product procurement, green energy procurement, and green technology procurement (Ghosh, 2018; Pelsa et al., 2020; Kimario et al., 2023; Salvsen et al., 2024; Habila et al., 2025). However, this study focuses on green material procurement and green technology procurement.

Green Material Procurement

Green material procurement is the selection and purchase of reusable, recyclable, biodegradable materials that are presumed to be environmental friendly for production operations (Anane, 2020). Green materials are sourced locally and, recycled, and they do not contain toxins or any other chemical substance (Galle, 2015). These materials are less harmful to the environment than the traditional alternatives throughout their entire lifecycle. Examples of green materials are bamboo, reclaimed wood, straw bales, cork, and recycled steel. Green materials are not only durable in nature but also energy-efficient, and they are crucial for building sustainable infrastructure. Durable and reusable materials are generally considered greener than those that are single-use and quickly become waste (Kyalo, 2019). For example, materials such as glass and certain bio-plastics that are reusable or compostable are considered green materials due to their green approach to production. Ochieng (2019) noted that companies purchase green materials because they are produced with end-of life in mind, thereby making them reusable, recyclable, biodegradable, and compostable. In addition, green materials are purchased by companies for production activities as they reduce environmental burden. Unlike the procurement of traditional materials that often ends up in landfills as waste for centuries and unleashes harmful substances into the soil and water, the procurement of

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green materials undergoes recycling, reuse, and decompose into the soil without causing harm to the environment (Masudin et al., 2022).

Green Technology Procurement

Green technology procurement is the practice of selecting and purchasing clean technology that does not release harmful substances into the environment when used in the production, processing, and distribution operations of a firm (Anane, 2020). Green technology is a chain-wide transformation tool for reducing the cost of pollution and climate change (Wang et al., 2022). This type of technology does not emit any gas that causes harm to the air, and it uses energy and natural resources that reduce environmental degradation. Green technology is a newly developed technology or an improved version of the existing technology to replace the old or previous green technology. Such technology is new and environmentally friendly because it does not release any harmful emissions to the air during use (Mueller, 2017). The procurement of green technology demands a change in the procurement policies of a firm and a switch from the use of dirty technology to clean technology (Mohammed, 2021). It requires changing the initial way procurement is centered and powers the vehicles to implement greater transparency concerning the environment and procurement systems. By procuring green technology, a company can reduce its environmental footprint and gain a competitive advantage over its competitors (Shaker & Hussain, 2018). Soni (2015) stated that the procurement of green technology can help companies to reduce the amount of carbon emissions released into the air during industrial operations and reduce global warming.

Concept of Environmental Performance

Environmental performance refers to the result obtained by a firm from engaging in activities to achieve its environmental goals for a specific period of time (Yu & Ramanthan, 2015). It indicates how well or poorly a firm is doing in terms of achieving its environmental goals. Some of the environmental goals of firms include environmental: sanitation, waste reduction, pollution reduction, water conservation, land preservation, and climate action (Yu & Ramanthan, 2015). Environmental performance of a firm can be determined by comparing the actual result of the firm against the environmental goals set by the firm for a specific period of time (Hervani et al., 2022). When a firm achieves its environmental goals for a specific period of time, the firm can be said to have produced a good environmental performance, but where the firm fails to achieve its environmental goals at the end of a specific period, the firm can be said to have produced a poor environmental performance (Hervani et al., 2022). Companies generally need to improve their environmental performance in order to contribute meaningfully towards building a sustainable economy (Libuhi, 2025). When companies reduce their industrial waste and greenhouse gas emissions, it will go a long way in making the world a better place to live, free from pollution and health hazards (Mohammed, 2021).

Measures of Environmental Performance

There are several indicators used to measure the environmental performance of a firm. However, this study measures environmental performance using waste reduction and pollution reduction.

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Waste Reduction

Waste reduction refers to the extent to which business organizations are able to minimize the amount of solid and water wastes deposited into the environment in the process of carrying out their business activities (Yu & Ramanthan, 2015). Waste reduction is one of the requirements to improve environmental performance of firms (Ivanov, 2020). Sharma et al. (2022) noted that companies generate a large amount of waste during the process of carrying out their business activities. These wastes pollute the environment and make it unsuitable for healthy living. Pullen (2014) revealed that 50-60% of environmental degradation occurs as a result of the poor waste management. Excessive dumping of solid waste degrades the environment and makes it unsuitable for the present and future generations. Cheng (2011) stated that excessive waste disposal causes more harm to the natural ecosystem and limits its capability to support human life. It makes the environment unconducive and irritating, thereby making it unproductive for the presents and future generations to use. Hervani et al (2022) opined that excessive waste in the environment leads to health challenges and this poses a threat to human health and existence. Therefore, companies must reduce the amount of waste brought into the environment.

Pollution Reduction

Pollution reduction refers to an organizational effort aimed at minimizing the amount of carbon emissions, released into the air while conducting their business operations (Bellassen, 2015). Companies usually release a large amount of emissions into the air during the process of production and distribution of goods to end-users. The amount of emissions released into the atmosphere causes health challenges to the people in their host communities (Yu & Ramanthan, 2015). Esfahbodi, et al., (2017) noted that carbon emissions released into the atmosphere are dangerous to human health, causing all sorts of health problems, including cancers. To minimize the environmental and health implications of business activities, companies need to redesign their business strategy to incorporate environmental consciousness by lessening the amount of emissions released into the air. Jones and Kammen (2011) stated that when companies redesign their production system by using cleaner and efficient energy technology, the environment will be sanitized since the amount of air pollution will be drastically minimized.

Theoretical Review

This study is guided by the legitimacy theory, which was developed by John Dowling and Jeffrey Pfeffer in 1975. The theory states that business firms have a social contract with the society in which they operate. While the firms are allowed to operate in the society and maximize profit, the society expects the firms to protect the environment from pollution and degradation and take the social well-being of the people into consideration while doing business (Islam & Craig, 2008). Every business organization has the duty to meet the expectations of society. When a company meets the expectations of society, it would be viewed as being legitimate and vice versa. The legitimacy theory is relevant to this study as it provides a strong support for green procurement practices as a basis for companies to maintain the social contract with the Nigerian society and improve their environmental performance. The theory argues that the practice of green procurement will enable companies to meet the expectations of the society in terms of ensuring environmental sanity. Stakeholders in Nigeria such as the government, community leaders, religious leaders, and consumers expect companies to protect

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the environment in the course of carrying out their business activities. When companies practice green procurement, government, community leaders, and consumers will applaud them for meeting societal expectations in terms of protecting the environment.

Empirical Review

A number of studies have been conducted on green procurement practices and performance of firms. For instance, Msemwa et al. (2024) investigated the influence of green procurement on the performance of manufacturing industries in Tanzania. Their study employed the case study research design and the mixed research methods, where a structured questionnaire and interview were used to collect data from 55 employees drawn from the procurement department of Mkulazi Holding Company in Morogoro region of Tanzania. The qualitative data obtained via interview were analyzed using thematic content analysis, while the quantitative data collected via questionnaire were analyzed using percentage and frequency counts and pie charts. The findings revealed that green procurement has a positive influence on operational effectiveness, output quality, corporate social responsibility, organizational growth, productivity, customer satisfaction, and profitability of Mkulazi Holding Company. The study concluded that green procurement has a positive influence on the competitiveness and performance of manufacturing industries in Tanzania.

Kipuyo (2020) empirically examined the influence of green procurement practices on organization performance in the manufacturing sector in Tanzania. Their study adopted the case study research design and quantitative research approach, where a structured questionnaire was used to collect data from 50 suppliers at Lodhia Steel Company in Arusha. The data collected from the respondents were analyzed using descriptive statistics such as frequency distribution tables, percentage analysis, mean, and standard deviation, while the hypotheses were tested using a linear regression model and SPSS version 24. The findings revealed that green procurement practices have positive and significant influence on the performance of Lodhia Steel Company in Arusha.

Ghosh (2018) examined the determinants of green procurement implementation and its impact on firm performance. The study adopted the descriptive survey research design and the quantitative research approach, where data were collected from managers and procurement officers of selected companies in India. The data collected were analyzed using percentage and frequency tables and regression analysis and SPSS version 19. The findings revealed that environmental challenge, stakeholder pressure, government policies and competitive factors are the major determinants of green procurement implementation in Indian firms. The study also revealed that green procurement implementation has significant impact on firm performance.

Anane (2020) carried out a study to determine the influence of green procurement procedures, on organisational performance. The researcher adopted the survey research design and the quantitative approach, where a questionnaire was used to collect data from managers in selected manufacturing firms in Ghana. The data collected were analyzed using descriptive statistics such as percentage and frequency analysis, bar charts, and pie charts, while the hypotheses were tested using regression analysis and SPSS version 20. The findings revealed the effect of green procurement procedures on the profitability and cost reduction of firms. The study also revealed the green procurement procedure has significant influence on organisational performance.

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Wambui and Chege (2024) carried out a study to determine the relationship between green procurement practices and supply chain performance of food and beverage processing firms in Kenya. Their study adopted the cross-sectional and descriptive survey research design where data were collected from 108 food and beverage processing firms in Nairobi City County using a structured questionnaire. The data collected were analyzed using percentage and frequency counts and, mean and standard deviation, while the hypotheses were tested using Pearson correlation and multiple regression analysis. The findings revealed that green procurement practices (green specification, cost reduction, and waste management) have a significant relationship with supply chain performance (reliability, responsiveness, lead time, and cost reduction) of food and beverage processing firms in Kenya.

David and Mamud (2024) carried out a study to determine the relationship between green procurement and performance of food and beverage firms in Port Harcourt, Nigeria. The researchers adopted the correlational research design and used a structured questionnaire to collect data from 60 employees drawn from 12 food and beverage firms in Port Harcourt. The data collected were analyzed statistically while the hypotheses were tested using the Pearson Product Moment Correlation Coefficient. The findings revealed that technological innovation significantly influences employee performance. The study also revealed that green procurement (lifecycle costing, environmental consideration and green supply chain management) has a significant relationship with the performance (profitability, efficiency, and productivity) of food and beverage firms in Port Harcourt.

Kimario et al. (2023) explored the relationship between green procurement and performance of manufacturing firms in Kenya. Their study adopted the correlational research design and the quantitative research approach, where data were collected from 152 employees drawn from the procurement departments of 15 manufacturing firms in Nairobi. The data collected were analyzed using descriptive statistics such as percentage and frequency tables while the hypotheses were tested using Pearson Product Moment Correlation and regression analysis. The findings revealed that green procurement has a significant relationship with the performance of manufacturing firms in Kenya.

Gap in Literature

Three major gaps were identified from the literature reviewed. First, it was observed that none of these previous studies conducted on green procurement practices relate the concept to environmental performance of firms. Secondly, it was observed that none of the previous studies focused on green material procurement and green technology procurement and related them to waste reduction and pollution reduction of firms. Thirdly, it was observed that none of the previous studies conducted on green procurement practices and performance focused on quoted industrial goods manufacturing firms in Nigeria. The gaps created in literature need to be filled urgently, and this is the motivation behind this study.

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METHODOLOGY

This study adopted the correlational research design and the quantitative research approach. The population of the study consisted of 12 industrial goods manufacturing firms quoted on the Nigerian Stock Exchange (Nigerian Stock Exchange Factbook, 2025 Edition). The sampling unit was made up of procurement managers, production managers, operational managers, innovation managers, and strategic managers of the 12 quoted industrial goods manufacturing firms in Nigeria. A population of 60 managers of the above categories was drawn from the 12 quoted industrial goods manufacturing firms in Nigeria on the ratio of 5 managers per firm. The census sampling technique was adopted since the population is researchable. A structured questionnaire was used as the main instrument for data collection. The questionnaire was structured on a 4-point Likert scale such as Strongly Agree, Agree, Disagree, and Strongly Disagree. After validating the instrument using content analysis and confirming its reliability using Cronbach Alpha method, 60 copies of the questionnaire was administered to the respondents with the aid of three (3) trained research assistants. Out of the 60 questionnaires administered to the respondents, 53 copies were collected from them. The data collected were analyzed in tables while the hypotheses were tested using Spearman Rank Order Correlation Coefficient (rho). The SPSS version 24 was used for computation and bivariate analysis.

RESULTS AND DISCUSSION

The result of the bivariate analysis carried out between green procurement practices and environmental performance of quoted industrial goods manufacturing firms in Nigeria is presented in the tables below:

Table 1: Result of bivariate analysis between green material procurement and waste reduction of quoted industrial goods manufacturing firms

			Green Material Procurement	Waste Reduction
Spearman (rho)	Green Material Procurement	Correlation Coefficient	1.000	.834**
		Sig. (2- tailed)	.	.001
		N	53	53
	Waste Reduction	Correlation Coefficient	.834**	1.000
		Sig. (2 -tailed)	.001	.
		N	53	53

**Correlation is significant at 0.01 levels (2- tailed)
*Correlation is significant at 0.05 levels (2- tailed)

Source: *SPSS-Generated Output*

Table 1 shows a very strong and positive correlation between green material procurement and waste reduction of quoted industrial goods manufacturing firms in Nigeria (rho = .834**) and this correlation is significant at 0.01 level. This result leads to the rejection of the null hypothesis (Ho_1) and the acceptance of the alternate hypothesis,which states that there is a significant relationship between green material procurement and waste reduction of quoted industrial goods manufacturing firms in Nigeria.

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Table 2: Result of bivariate analysis between green material procurement and pollution reduction of quoted industrial goods manufacturing firms

			Green Material Procurement	Pollution Reduction
Spearman (rho)	Green Material Procurement	Correlation Coefficient	1.000	.778**
		Sig. (2-tailed)	.	.001
		N	53	53
	Pollution Reduction	Correlation Coefficient	.778**	1.000
		Sig. (2-tailed)	.001	.
		N	53	53

**Correlation is significant at 0.01 levels (2-tailed)
*Correlation is significant at 0.05 levels (2- tailed)

Source: *SPSS-Generated Output*

Table 2 indicates that green material procurement is strongly and positively correlated with pollution reduction of quoted industrial goods manufacturing firms in Nigeria (rho = .778**) and this correlation is significant at 0.01 level. Based on this result, we then reject the null hypothesis (Ho_2) and accept the alternate hypothesis, which states that there is a significant relationship between green material procurement and pollution reduction of quoted industrial goods manufacturing firms in Nigeria.

Table 3: Result of bivariate analysis between green technology procurement and waste reduction of quoted industrial goods manufacturing firms

			Green Technology Procurement	Waste Reduction
Spearman (rho)	Green Technology Procurement	Correlation Coefficient	1.000	.632**
		Sig. (2-tailed)	.	.001
		N	53	53
	Waste Reduction	Correlation Coefficient	.632**	1.000
		Sig. (2-tailed)	.001	.
		N	53	53

**Correlation is significant at 0.01 levels (2-tailed)
*Correlation is significant at 0.05 levels (2-tailed)

Source: *SPSS-Generated Output*

Table 3 shows that green technology procurement has a strong and positive correlation with waste reduction of quoted industrial goods manufacturing firms in Nigeria (rho = .632**) and this correlation is significant at 0.01 level. Consequently, the null hypothesis (Ho_3) is rejected in favour of the alternate hypothesis. This means that we then accept that there is a significant relationship between green technology procurement and waste reduction of quoted industrial goods manufacturing firms in Nigeria.

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Table 4: Result of bivariate analysis between green technology procurement and pollution reduction of quoted industrial goods manufacturing firms

			Green Technology Procurement	Pollution Reduction
Spearman (rho)	Green Technology Procurement	Correlation Coefficient	1.000	.879**
		Sig. (2-tailed)	.	.001
		N	53	53
	Pollution Reduction	Correlation Coefficient	.879**	1.000
		Sig. (2-tailed)	.001	.
		N	53	53

**Correlation is significant at 0.01 levels (2-tailed)
*Correlation is significant at 0.05 levels (2-tailed)

Source: *SPSS-Generated Output*

Table 4 reveals that green technology procurement has a very strong and positive correlation with pollution reduction of quoted industrial goods manufacturing firms in Nigeria (rho = .879**) and this correlation is significant at 0.01 level. This result leads to the rejection of the null hypothesis (Ho_4) and the acceptance of the alternate hypothesis, which states that there is a significant relationship between green technology procurement and pollution reduction of quoted industrial goods manufacturing firms in Nigeria.

DISCUSSION OF FINDINGS

This study found a significant relationship between green material procurement and waste reduction of quoted industrial goods manufacturing firms in Nigeria. This finding was deduced from the result of the bivariate analysis carried out on the two variables. The result showed a very strong and positive correlation between green material procurement and waste reduction of quoted industrial goods manufacturing firms in Nigeria (rho = .834**) and this correlation is significant at 0.01 level. This result led to the rejection of the null hypothesis (Ho_1) and the acceptance of the alternate hypothesis, which states that there is a significant relationship between green material procurement and waste reduction of quoted industrial goods manufacturing firms in Nigeria. This finding is supported by Galle (2015) who noted that green materials enable companies to reduce waste and improve their environmental performance. Habila et al., (2025) also agreed with this finding when they reported that companies that purchase green materials for their production activities reduce their waste by 50%.

This study also reported a significant relationship between green material procurement and pollution reduction of quoted industrial goods manufacturing firms in Nigeria. This finding was derived from the result of the bivariate analysis carried out on the two variables. The result revealed that green material procurement is strongly and positively correlated with pollution reduction of quoted industrial goods manufacturing firms in Nigeria (rho = .778**) and this correlation is significant at 0.01 level. Based on this result, we then rejected the null hypothesis (Ho_2) and accepted the alternate hypothesis, which states that there is a significant relationship between green material procurement and pollution reduction of quoted industrial goods manufacturing firms in Nigeria. This finding is consistent with the findings of Ochieng (2019)

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and Anane (2020), as both studies revealed that green material procurement significantly reduces environmental pollution.

This study discovered a significant relationship between green technology procurement and waste reduction of quoted industrial goods manufacturing firms in Nigeria. This finding was obtained from the result of the bivariate analysis carried out on the two variables. The result revealed that green technology procurement has a strong and positive correlation with waste reduction of quoted industrial goods manufacturing firms in Nigeria (rho = .632**) and this correlation is significant at 0.01 level. Consequently, the null hypothesis (Ho_3) was rejected in favour of the alternate hypothesis. This means that we then accepted that there is a significant relationship between green technology procurement and waste reduction of quoted industrial goods manufacturing firms in Nigeria. This finding is supported by Libuhi (2025) who posited that green technology enables companies to reduce the amount of waste generated during production activities. Kimario et al. (2023) supported this finding when they revealed that green technology procurement enables companies to utilize resources efficiently and reduce industrial waste.

Finally, it was discovered that a significant relationship exists between green technology procurement and pollution reduction of quoted industrial goods manufacturing firms in Nigeria. This finding was emanated from the result of the bivariate analysis carried out on the two variables. The result revealed that green technology procurement has a very strong and positive correlation with pollution reduction of quoted industrial goods manufacturing firms in Nigeria (rho = .879**) and this correlation is significant at 0.01 level. This result led to the rejection of the null hypothesis (Ho_4) and the acceptance of the alternate hypothesis, which states that there is a significant relationship between green technology procurement and pollution reduction of quoted industrial goods manufacturing firms in Nigeria. This finding is in line with the research conducted by Salvsen et al. (2024) and Masudin et al. (2022), as both studies revealed that green technology procurement enables companies to reduce their greenhouse gas emissions, and improve their environmental performance.

CONCLUSIONS

This study examined the relationship between green procurement practices and environmental performance of quoted industrial goods manufacturing firms in Nigeria. From the result of analysis carried out, it was revealed that green material procurement has a significant relationship with waste reduction of quoted industrial goods manufacturing firms in Nigeria. The study also found a significant relationship between green material procurement and pollution reduction of quoted industrial goods manufacturing firms in Nigeria. A significant relationship was equally reported between green technology procurement and waste reduction of quoted industrial goods manufacturing firms in Nigeria. The study discovered a significant relationship between green technology procurement and pollution reduction of quoted industrial goods manufacturing firms in Nigeria. From the findings, it was concluded that green procurement practices such as green material procurement and green technology procurement have a significant relationship with environmental performance (waste reduction and pollution reduction) of quoted industrial goods manufacturing firms in Nigeria.

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RECOMMENDATIONS

The following recommendations are made based on the findings and conclusion:

1. Quoted industrial goods manufacturing firms in Nigeria, especially those that are experiencing poor environmental performance, should practice green procurement as it would improve their environmental performance.

2. Quoted industrial goods manufacturing firms in Nigeria, particularly those that are generating large volume of waste and carbon emissions, should purchase green materials such as recyclable and reusable materials for their production operations, as it would go a long way in reducing their waste and greenhouse gas emissions.

3. Quoted industrial goods manufacturing firms in Nigeria, should purchase green technology for their business operations, as this would help to reduce waste and minimize their carbon emissions, during production and distribution operations.

4. Quoted industrial goods manufacturing firms in Nigeria should procure green energy such as solar energy panels, biomass, and wind turbines to complement their green material and technology procurement efforts, as it would help to reduce their energy consumption during production activities and improve their environmental performance.

5. Finally, it is recommended that firms select raw material suppliers based on sustainability criteria and maintain good relationships with them, as this will sustain green procurement practices

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