Journal Homepage: www.ijarpr.com ISSN: 3049-0103 (Online)

International Journal of Advance Research Publication and Reviews

Vol 02, Issue 09, pp 82-92, September 2025

Green Innovation and Brand Reputation of Small and Medium Enterprises (SMEs) in Southwest, Nigeria

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ABSTRACT

This study examined the relationship between green innovation dimensions (green product innovation, green process innovation, and green service innovation) and brand reputation of SMEs in Southwest, Nigeria. A quantitative research design was adopted, with data collected from 327 SMEs Owners/Managers using a structured questionnaire. The data were analysed using descriptive and multiple regression analysis. The results revealed that green innovation accounts for 34.6% variation in brand reputation ($F = 8.985$, $p < .005$). Both green product innovation ($\beta = 0.172$, $p = 0.008$) and green service innovation ($\beta = 0.215$, $p < 0.001$) had significant positive effects on brand reputation, with green service innovation exerting the strongest influence. In contrast, green process innovation ($\beta = 0.022$, $p = 0.721$) did not have a statistically significant effect. These findings suggest that customers and stakeholders may place greater value on environmental initiatives that are tangible and visible in products and services, compared to less visible process-oriented innovations. The study recommends that SMEs aiming to enhance brand reputation should prioritise green service and product innovations. This study contributes to the body of knowledge by providing empirical evidence on the differentiated impacts of green innovation dimensions on brand reputation of SMEs.

Keywords: Brand reputation**,** green innovation, green process innovation, green product innovation, green service innovation

1. Introduction

Brand reputation is a critical asset for all organisations, regardless of size. It is commonly seen as a form of intangible asset that consists of brand ownership, customer relationship, product quality, and service delivery, and is fundament to business survival and development in the current competitive global market (Lu et al., 2020; Castilla-Pollo et al., 2025). SMEs accounted for 99% of firms globally (OECD, 2023), and they can derive both financial and strategic benefits from a strong reputation (Whiting et al., 2017). Financially, a strong reputation can generate goodwill that enhances firm valuation and increases purchase prices when ownership changes hands (Whiting et al., 2017). Strategically, it has the potential to attract quality stakeholders, produce positive business relationships, and causes firm to be stronger in the market.

A growing body of literature positions reputation as a source of competitive advantage for SMEs (Lopez-Perez et al., 2017; Lu et al., 2020), indirectly improving performance. However, Adostini et al. (2017) posits that while large firms tend to appreciate and invest in the long-term benefits of reputation, SMEs are often hampered by short-term survival imperatives, which limit their ability to build a strong reputation in the business environment. They are also limited by the lack of financial resources, which limits their ability to invest in innovation (Hamme & Korpela, 2014; Whiting et al., 2017). This leaves many SMEs either dependent on the help of the private equity or government measures. As much as there are support agencies like SMEDAN in Nigeria, few of SMEs receive the support with corruption and lack of equal distribution of

resources being significant challenges as resources are often accessed based on personal networks (Page & Okeke, 2019). Therefore, Nigerian SMEs come to rely on internal capabilities to sustain operations and develop market trust.

Reputation itself can be understood as the collective perceptions, emotions, and experiences of stakeholders towards a brand or organisation (Le, 2022). These perceptions are formed gradually based on corporate actions and decisions that are made. Trustworthiness and transparency can be increased when positive firm's actions and decisions are compatible with the stakeholders values, which includes adopting corporate social responsibility (CSR), fair labour practices, and environmental protection (Schoonmaker et al., 2017). In highly competitive and volatile markets like Nigeria, where SMEs have lower visibility and limited access to finance, building and communicating a strong reputation is essential for competing with larger firms. For instance, studies have linked reputation to higher profitability (Cantele & Zardini, 2018; Gallardo-Vázquez et al., 2019; Shahin et al., 2020), driven by customer trust, loyalty, and willingness to pay premium prices for products or services (Llorca-Ponce et al., 2021; Le, 2022). Furthermore, empirical evidence reveals a positive relationship between brand reputation and innovation capacity, emphasizing that innovation can reinforce reputation and vice versa (Izadi et al., 2020).

Recently, there has been a rise in stakeholder and consumer interest on environmentally friendly practices and products. This shift compels SMEs to adopt green initiatives that safeguard and enhance their reputation. Green innovation serves not only as a response to environmental and social challenges but also as a pathway to sustainable economic growth (Castillo-Pollo et al., 2025). Recent studies in Nigeria reported that green innovation offers both economic and environmental benefits to SMEs (Adeyokunnu et al., 2025) and has significant positive effect on corporate performance (Wilson-Oshilim and Omoye, 2025). However, much of the existing research focused on performance broadly, without specifically examining the effect of green innovation on brand reputation. This study addresses this gap by assessing how green innovation (green product, green service, and green process innovations) influence brand reputation of SMEs in Southwest Nigeria.

2. Literature Review

2.1 Empirical Review

Green innovation has increasingly been recognized as a strategic driver of firm performance in both developed and developing economies, with evidence showing that its impact varies depending on the type of innovation, the industry context, and the stage of economic development. In advanced economies, there is a strong alignment in findings that high-quality and well-targeted green innovations produce measurable improvements in financial, environmental, and competitive outcomes. Liu et al. (2024a) and Liu et al. (2024b), for example, found in their studies of Chinese A-share listed firms that substantive green innovations significantly enhance financial performance, while strategic green innovations, although less beneficial to short-term financial results, are more effective in improving environmental outcomes. Xiaoyuan et al. (2024) reported both immediate and long-term performance gains from green innovation in China's power industry, while Liu (2024), using two decades of S&P 500 firm-level data, demonstrated that green innovation not only boosts firm value but also reduces volatility and credit risk. Similarly, Mukhopadhyay and Nayak (2024), in a study across G7 and BRICS firms, showed that product-based eco-innovation dominates in G7 countries due to greater resource availability, whereas process and organizational innovations have stronger impacts in BRICS economies, reflecting different development priorities. Studies by Wang and Liu (2022) and Wang et al. (2025) further highlight that operational efficiency, market competitiveness, and regulatory pressures can strengthen the positive effects of green product and process innovations on performance.

In developing economies, including those in Africa, the findings are generally positive but show patterns shaped by local realities. In Nigeria, Chukwukadiba and Nnamani (2023) found that green product innovations had a stronger effect on market share than process innovations among manufacturing firms in Enugu, explaining this by the relative ease of developing new products compared to modifying established processes. Njoku et al. (2023) showed that eco-friendly measures such as solar-powered operations and green conferencing improved both employee and customer satisfaction in

the banking sector. Kifordu et al. (2023) reported that green innovation strategies, environmental orientation, and green product differentiation all had significant positive effects on SME performance in South-South Nigeria, with product distinctiveness producing the strongest effect. Other Nigerian studies, such as Oluwajimade and Olanrewaju (2023) in the pharmaceutical sector and Adeyokunnu et al. (2025) in Lagos SMEs, also found that green entrepreneurial initiatives and sustainable practices delivered both economic and environmental benefits. However, not all results align perfectly: Wilson-Oshilim and Omoye (2025) found no significant relationship between green knowledge and SME performance, a finding that contrasts with other studies and may be linked to differences in firm capabilities, resource access, or how green knowledge was measured. Evidence from outside Nigeria supports the general trend. In South Africa, Maziriri and Maramura (2022) found that green product and process innovations enhanced sustainable competitive advantage and performance among SMEs, while in Indonesia, Rustianrini et al. (2022) showed that green innovation, supported by intellectual capital, improved both sustainability and financial outcomes for SMEs.

When these studies are considered together, there is a clear pattern: across contexts, green innovation, whether in the form of product, process, or organizational changes, tends to be associated with improvements in financial results, environmental performance, competitive positioning, and stakeholder satisfaction. The similarities between findings in developed and developing economies suggest that the benefits of green innovation are broadly applicable. However, the focus often differs: in developed economies, green innovation is often linked to long-term value creation, risk reduction, and leadership in environmental responsibility, supported by strong technological capabilities and policy frameworks. In developing economies, the emphasis is more on immediate market gains, cost efficiency, and competitive survival, with limitations in infrastructure and finance influencing the types of innovations that are most feasible.

Despite the growing body of work, an important gap remains. Much of the Nigerian research has examined green innovation in terms of its effects on operations, costs, market share, and general firm performance. Far less attention has been given to how green innovation affects brand reputation, even though reputation is a critical intangible asset that influences customer loyalty, investor confidence, and a firm's ability to sustain competitive advantage. Given the rising consumer awareness of environmental responsibility and the reputational value this brings, understanding the relationship between green innovation and brand reputation among SMEs in Southwest Nigeria is essential. This study addresses that gap, providing evidence on how sustainable innovation practices contribute to building and maintaining a strong brand image, and in doing so, adds to the body of knowledge on sustainable business growth in emerging markets.

2.2 Theoretical Review

This study is anchored on the Ecological Modernisation Theory (EMT). The theory assumes that there is no contradiction between the protection of the environment and economic development; in contrast, environmental protection can be attained through innovation, technological improvement, and proactive organisational policies (Huber 1985; Gibbs, 2017; Julkovski et al., 2021). The theory underlines the possibility of improvement of the environment based on the market forces, institutional changes, and the use of eco-innovations in goods, services, and operations. In the context of SMEs, EMT suggests that the incorporation of green product innovation, green service innovation, and green process innovation can enhance environmental performance while simultaneously improving competitive advantage and brand reputation (Julkovski et al., 2021). By developing innovative eco-friendly products, using sustainable systems of service delivery and embracing cleaner productions, SMEs can react to growing environmental laws and consumer shifts toward having sustainable brands (Maziriri & Maramura, 2022; Rustiarini et al., 2022; Adeyokunnu et al., 2025). Therefore, EMT perspective aligns with the present study's focus on green innovation as a strategic tool for building and improving brand reputation of SMEs in Nigeria. EMT backs up the claim that green innovation not only reduces ecological footprints but also communicates a business's dedication to sustainability, which affects stakeholder perceptions and improves reputation in the marketplace.

2.3 Conceptual Framework

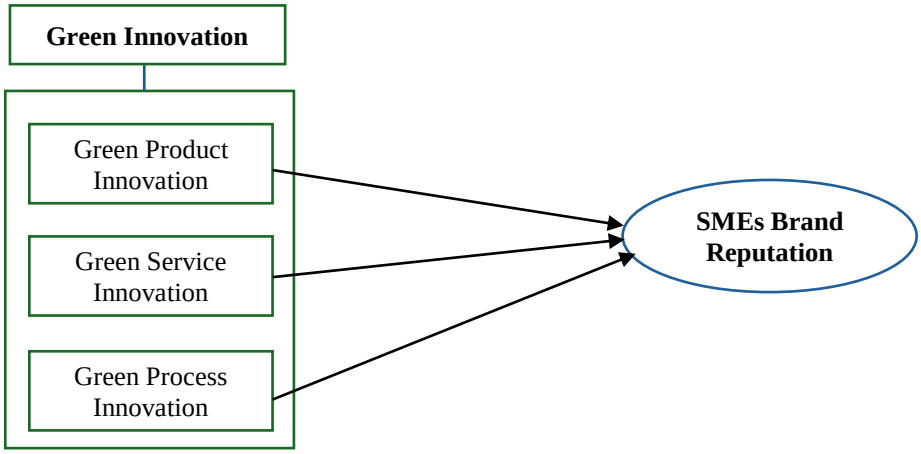

Fig. 1: Conceptual Framework of the Study

Source: Researchers' Design (2025)

3. Methodology

This study employed a cross-sectional research design and a quantitative research approach to investigate the relationship between green innovation and brand reputation among small and medium-sized enterprises (SMEs) in Southwestern Nigeria. The target population comprised all SMEs operating within the six states of the region. According to a PwC (2020) report, there are approximately 23,289 SMEs in Southwestern Nigeria. The sample size was determined using the Krejcie and Morgan formula, which yielded a required sample of 378 SME owners and managers. A stratified sampling technique was applied to ensure proportional representation from each state, while simple random sampling was used to select individual respondents within each stratum. Data were collected using a structured questionnaire designed to capture quantitative information on variables related to green innovation and brand reputation. The instrument was adapted from validated measures in prior empirical studies and employed a five-point Likert scale ranging from Strongly Agree (5) to Strongly Disagree (1). Reliability testing using Cronbach's alpha indicated that all variables achieved values above the recommended threshold of 0.70, confirming the instrument's internal consistency and suitability for the main data collection. Descriptive statistics, including frequency distributions and percentage tables, were first used to summarize the respondents' demographic and construct-related data. Inferential analysis was then conducted using multiple regression to examine the hypothesized relationships between green innovation and brand reputation. The model specification for the study is expressed as:

$$BR = \beta_0 + \beta_1 GPdI + \beta_2 GPcI + \beta_3 GSI + \varepsilon_i, \quad \text{(i)}$$

where BR = Brand Reputation, GPI = Green Product Innovation, GPrI = Green Process Innovation, GSI = Green Service Innovation, β1 - β3 represents the coefficient values of the predictors, εi represents error term, and β0 represents constant value.

3.1 Ethical Consideration

Before being included in the study, all participants provided their informed consent. The purpose of the study, the extent of their participation, and any possible risks and rewards of taking part were all explained in detail to the respondents. They were given the assurance that they could leave the study at any time without facing any repercussions. Personal identifiers were removed from the dataset to protect confidentiality and anonymity, and each participant was given a unique code to guarantee that their responses weren't tracked down. Unauthorised access was prevented because all data was safely stored and only the research team had access to them. Strict adherence to accepted ethical standards was maintained throughout

the study, with special attention paid to preventing coercion, deceit, or injury of any kind. Throughout the research process, participants' rights, welfare, and dignity were carefully respected.

4. Results and Discussion

4.1 Socio-demographic Information of the Respondents

Table 1 shows the socio-demographic characteristics of the respondents. Among the respondents, 55.05% were male, and the largest age group was 26–35 years, accounting for 40.37%. The majority held HND/B.Sc/B.Tech qualifications, representing 40.37% of the sample. Most respondents operated in the retail and wholesale trade sector, which made up 28.13% of the total. In terms of business experience, majority (38.53%) had been in operation for above 15 years.

Table 1 - Descriptive Analysis of the Respondents' Demographic Data

Variables		**Frequency**	**Percentage**
Gender	Male	180	55.05%
	Female	147	44.95%
Age Group	18 – 25	63	19.27%
	26 - 35	132	40.37%
	36 - 45	77	23.55%
	Above 45 years	55	16.82%
Educational Qualification	SSCE	37	11.31%
	OND/NCE	63	19.27%
	HND/B.Sc/B.Tech	132	40.37%
	Postgraduate	76	23.24%
	Others	19	5.81%
Industry Sector	Manufacturing	84	25.69%
	Agriculture	41	12.54%
	ICT	34	10.40%
	Hospitality & Tourism	32	9.79%
	Transportation & Logistic	44	13.46%
	Retail & Wholesale Trade	92	28.13%
Years of Operation	1 – 5 years	31	9.48%
	6 – 10 years	69	21.10%

Variables		Frequency	Percentage
	11 – 15 years	101	30.89%
	Above 15 years	126	38.53%

Source: Field Survey (2025)

4.2 Descriptive Statistics of the Variables (GPI, GPrI, GSI, BR)

The study variables were measured on a five-point scale ranging from strongly agree to strongly disagree. The results, as shown in Table 2, reveal that respondents generally agreed with all the statements. Green service innovation received the highest agreement with a mean score of 4.20, followed by green process innovation and brand reputation, both with a mean of 4.15. Green product innovation had the lowest mean score at 4.13, though it still reflects strong agreement. The standard deviations, which range from 0.75 to 0.84, suggest that responses were consistent across the sample.

Table 2 - Descriptive Statistics of the Green Innovation and Brand Reputation

Variables	Mean	Std Dev
Green Product Innovation	4.13	0.76
Green Process Innovation	4.15	0.76
Green Service Innovation	4.20	0.75
Brand Reputation	4.15	0.84

Source: Authors' Computation

4.3 Inferential Statistics

The multiple regression results in Table 3 show that green product innovation, green process innovation, and green service innovation collectively explain about 34.6% of the variation in brand reputation ($R^2 = 0.346$), with an adjusted R^2 of 0.339, indicating a good model fit. The F-statistic ($F = 8.985$, $p < 0.005$) confirms that the model is statistically significant overall. Looking at the individual coefficients, the constant value of 17.105 represents the baseline level of brand reputation when all predictors are held constant. The coefficient for green product innovation ($B = 0.172$, $p = 0.008$) indicates that a one-unit increase in green product innovation is associated with a 0.172 increase in brand reputation, holding other factors constant, and this relationship is statistically significant. Green process innovation, with a coefficient of 0.022 ($p = 0.722$), shows a very small and statistically insignificant effect, suggesting it does not meaningfully contribute to changes in brand reputation within this model. Green service innovation has the largest coefficient ($B = 0.215$, $p < 0.001$), meaning that for every one-unit increase in green service innovation, brand reputation increases by 0.215, and this effect is highly significant. The standardized beta values show that green service innovation has the strongest influence on brand reputation, followed by green product innovation, while green process innovation has minimal impact. This implies that service and product-related green innovations are more crucial drivers of brand reputation than process-based innovations among SMEs in Southwest, Nigeria.

Table 3 - Multiple Regression Results

R	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
.588[a]	.346	.339	2.42643

Coefficients [a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	17.105	2.479		6.900	.000
Green Product Innovation	.172	.065	.148	2.658	.008
Green Process Innovation	.022	.061	.020	.356	.722
Green Service Innovation	.215	.060	.200	3.560	.000

a. Predictors: (Constant), Green Service Innovation, Green Product Innovation, Green Process Innovation

b. Dependent Variable: Brand Reputation

c. F = 8.985; p value < .005

Source: Authors' Computation (2025)

4.4 Discussion of Findings

The findings from this study indicate that among SMEs in Southwest Nigeria, green service innovation and green product innovation have significant positive effects on brand reputation, while green process innovation does not show a statistically significant relationship. The model explains about 34.6% of the variation in brand reputation, suggesting that while green innovation plays an important role, other factors also contribute to how these businesses are perceived. The stronger effect of green service innovation, followed by green product innovation, aligns with the idea that customer-facing innovations are more visible and directly influence brand perceptions, while process innovations may have less immediate impact on public image.

These results are in line with several past studies. For instance, Chukwukadiba and Nnamani (2023) also found that green product innovation significantly enhanced market share and had a higher impact on performance than green process innovation, citing the relative ease of developing new products compared to altering production processes. Similarly, Maziriri and Maramura (2022) established that both green product and process innovations improved competitive advantage and business performance in South African SMEs, though our findings suggest process innovations might have a weaker role in brand-related outcomes. Wang and Liu (2022) also confirmed that all three green innovation types contribute to firm performance, with product and service innovations often showing stronger effects under supply chain and operational pressures.

The strong impact of green service innovation observed here also resonates with Njoku et al. (2023), who demonstrated that environmentally friendly customer-facing practices, such as the use of solar power and eco-friendly events, significantly improved stakeholder satisfaction in Nigerian banks. This indicates that visible and interactive forms of green innovation, whether in services or products, can strengthen reputational outcomes. In contrast, the non-significant result

for green process innovation in our study stands in contrast to Mukhopadhyay and Nayak (2024), who reported process innovations as having substantial effects in BRICS countries, including Nigeria. The discrepancy may stem from sectoral differences, as manufacturing or resource-heavy industries often derive more reputational benefits from process changes than service-oriented SMEs.

Overall, these results contribute to the growing evidence, as supported by studies such as Liu et al. (2024a, 2024b), Xiaoyuan et al. (2024), and Kifordu et al. (2023), that green innovation strategies are a viable path to improved performance. However, they also emphasize that in the SME context of Southwest Nigeria, product and service innovations carry more reputational weight than internal process changes. This insight can guide SMEs in prioritizing visible, customer-linked sustainability initiatives to strengthen brand reputation while still pursuing process innovations for operational and environmental gains.

5. Conclusion, Recommendations, and Contributions to Knowledge

5.1 Conclusion

The study concludes that green innovation, particularly green service innovation and green product innovation, plays a significant role in enhancing brand reputation among sampled SMEs in Southwest, Nigeria. The findings show that green service innovation had the strongest positive influence on brand reputation, followed by green product innovation, while green process innovation did not significantly contribute to brand reputation within the study context. This suggests that customers and stakeholders may place greater value on visible product and service-related environmental initiatives compared to internal process changes. The findings highlight the importance of sustainable innovation strategies in building and maintaining a strong brand image.

5.2 Recommendations

Based on these findings, the study recommends that firms seeking to strengthen their brand reputation should prioritise green service and product innovations, ensuring that such initiatives are well-communicated to their stakeholders. Green process innovations should not be overlooked, but their impact might be enhanced when integrated with customer-facing environmental initiatives. Managers should invest in training, research, and the adoption of sustainable technologies that not only improve environmental performance but also align with market expectations. Policymakers could support these efforts by providing incentives for firms to adopt comprehensive green innovation strategies.

For future research, it is recommended that scholars investigate why green process innovation was found to be insignificant in this study. Such studies could explore whether this outcome is due to low visibility to consumers, insufficient integration into marketing communications, or sector-specific factors. Further research across different industries, larger sample sizes, and diverse geographical locations could provide more generalisable insights. Additionally, a longitudinal approach could track how the relationship between green innovation dimensions and brand reputation evolves over time.

5.3 Contribution to Knowledge

This study contributes to the body of knowledge by providing empirical evidence on the varying effects of different dimensions of green innovation on brand reputation of SMEs in Southwest, Nigeria. It advances understanding of how SMEs can strategically align sustainability initiatives with brand-building objectives, thereby bridging the gap between environmental responsibility and competitive advantage.

Acknowledgements

We sincerely appreciate the efforts of the SMEs managers in Southwest Nigeria who generously participated in this study. Your time and honest responses to the questionnaire provided invaluable insights. This research would not have been possible without your cooperation and support.

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