Drivers and barriers of green practices adoption: A survey of small and medium-sized manufacturing enterprises in an emerging economy

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ABSTRACT

This study examines the key drivers and barriers influencing GP adoption among SMMEs in Southwestern Nigeria. A quantitative survey design was employed using a structured questionnaire administered to 320 SMMEs across Lagos, Ogun, Oyo, and Osun States. Respondents were selected through a combination of convenience and purposive sampling, and the data were analyzed using the Relative Importance Index (RII) to rank the identified drivers and barriers. The findings indicate that government regulations, financial incentives, supportive organizational policies, resource commitment, and competitive pressures are the most influential drivers of GP adoption. In contrast, limited awareness of the benefits of green practices, high implementation costs, inadequate government financial incentives, insufficient regulatory guidance, and limited flexibility in transitioning to green systems constitute the most prominent barriers. These findings demonstrate that green-practice adoption among SMMEs is shaped by the interaction of institutional support, financial capacity, organizational readiness, and competitive pressures. The study contributes to the sustainable manufacturing literature by providing empirical evidence from a developing-country context and identifying the relative importance of the factors that facilitate or constrain green-practice adoption. The findings also offer practical implications for policymakers and industry stakeholders by highlighting the need for coordinated regulatory support, accessible financial incentives, clear implementation guidance, and targeted capacity-building initiatives to accelerate sustainable manufacturing among SMMEs.

Keywords: *Small and Medium-sized Manufacturing Enterprises; Drivers; Barriers; Green Practices; Adoption*

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INTRODUCTION

The emergence of environmental damage as a key challenge for nations in today's global business environment has prompted increased concerns among corporate stakeholders about environmental issues and how businesses could make their contributions towards sustainable development. Consequently, sustainability issues are increasingly becoming interesting topics in both the academia and industry. Firms make their environmental contributions through their combined impacts on climate change, water scarcity, biodiversity, waste and pollution (Wildnerova, et al, 2024). The growing concerns of governments and communities about natural resources depletion and the contamination of the environment, has shifted global attention to green innovation (Wasiq et al., 2023).

The increased awareness of environmental issues and corresponding solutions among today's businesses has intensified their focus on environmental performance assessment and analysis (Lutfi et al., 2023). As a result of the rising global awareness of the environmental issues, businesses have increased their adoption of green practices (GPs) such as green production, sustainable supply chain management practice, and eco-friendly waste management to limit their impacts on environment, achieve regulatory compliance, and meet expectations of consumer (Surbakti et al, 2025). GPs involve the act of operating a product, an equipment or a system in line with the criteria which reduce negative impact on environment, achieve low greenhouse gas (GHG) emissions, ensure safety of usage and promote a healthy environment (Ahmad, et al, 2019). GPs are essential in fighting global warming and reduce wastage in the use of scarce resources (Rekik & Bergeron, 2017). GPs emerge as an optimum solution for dealing with environmental issues (Kifordu et al, 2023; Shuklar et al, 2023). Studies have discovered that green practice is an exceptional solution to help firms to gain several benefits which include reputation building and competitive advantages (Huang et al, 2022).

Manufacturing firms, through their distinct production phases have continuously been causing major harms to the natural environment. This makes it imperative to pay major attention to how efficient and less polluting manufacturing activities can be reinvented to ensure acceptable, viable and equitable development. The global transition toward sustainable manufacturing products and practices has prompted business organizations to pay more attention to adoption of strategies that improve their delivery of better customer value (Iqbal, et al, 2025). Adoption of sustainable practices will aid minimization of carbon footprint, reduce waste and conserve energy. Small and medium-sized enterprises (SMEs) which are responsible for significant amount of environmental footprint and 50% of global GHG play an important role in this transition (OECD, 2025).

Aside making significant contributions to carbon footprint on the aggregate, SMEs, through their innovative acts and commitment to the adoption of environmental-friendly practices can also make vital contribution to reaching net zero (Wildnerova, et al, 2024). Additionally, SMEs play vital role in the world economy by constituting above 90% of businesses and creating approximately 70% of the world employment (Oladoye & Akinlo, 2023; DCED, 2025). Furthermore, owing to the significant contribution of SMEs as the major economic pillars in most nations, their survival, productivity and competitiveness remain of a great concern. By leveraging on adoption of environmentally conscious practices, SMEs enhance business growth and also reduce their harms to the environment, thus promoting both their own successes and the total sustainable development of the economy as a whole (Kehinde & Onuoha, 2023). Sustainable manufacturing growth is critical to reduction in the degradation of the environment, improved benefits to the economy, and promotion of social standards (Ojo et al., 2024). GPs integration also provides innovation opportunities for SMEs, since sustainability

motivated initiatives often result in the development of new products, processes and business models (Omowole et al., 2024). Consequently, by adopting sustainability practices, they help build a greener future for all of us.

However, unlike large businesses, several of these SMEs struggle with implementing environmentally conscious business practices. Studies have shown that several factors have influence on adoption of GPs, and they play major roles in their implementation. These factors are in two categories which include the supporting factors (drivers) which motivates the adoption and the opposing factors (barriers) which against it (Shuklar et al, 2023, Fatoki, 2019; Norani et al, 2015). An array of motivating factors to GPs adoption includes internal forces such as financial capability, organizational policies, and leadership to external factors such as initiatives on reduction of global pollution and consideration on GHG emissions. Furthermore, the adoption of these practices has been associated with numerous benefits, including significant cost savings, enhancement of brand reputation, improved regulatory compliance, and increased resilience to environmental risks (Omowole et al, 2024).

Conversely, barriers to GPs adoption encompasses issues like financial limitations and employee engagement challenges, as well as external challenges such as integration of suppliers and volatility in market pricing (Mwanaumo & Mwanza, 2024). Having the knowledge of barriers facing companies in their efforts to achieve sustainable development, such as high start-up cost, poor technical understanding and ambiguous regulations, is critical for development of appropriate strategies, policies and solutions that motivate and aid its adoption (Escobar, et al., 2023). However, poor political institutions, weak awareness creation, inadequacies of data, weak coordination among actors in green economy together with institutional and human capacity gaps constitute serious hurdles in the achievement of viable green economy (Chukwu, 2020).

Many recent studies have identified the drivers that support and the barriers hindering the implementing green practices among firms. However, most of the literature on this topic pertain to foreign countries, and there is limited empirical evidence from the context of Nigeria which is still faced with several social, economic and environmental problems. Studies such as Abdul (2024); Escobar et al (2023); Shukla et al (2023); Mei (2023); Chenari (2023); Zulu et al (2023); Nyahuna et al. (2023); Huang, et al. (2022); Purwandani and Michaud (2021); Koirala (2019) were conducted outside the shore of Nigeria. Few studies conducted on the topic in Nigeria such as Chukwu (2020); Omopariola (2019); Onososen et al. (2019) were done mostly on large firms in the constructions sector and not in SMEs. Hence, this research aimed to find out the key drivers that motivate and the barriers that obstruct SMMEs in their attempts to implement GPs in the Southwestern Nigeria.

LITERATURE REVIEW

Green Practices

Green practices (GPs), also known as sustainable practices, refer to an array of activities, strategies and policies adopted and implemented by firms with aim of reducing their environmental imprints, promote social accountability and ensure economic sustainability over long term (Iqbal et al, 2025). "Greening" covers any direct or indirect activity that reduces the negative impact of firms on the environment, ranging from emissions reduction to resource efficiency to circular economy principles implementation (Wildnerova et al, 2024). GPs such as green product innovation, eco-friendly waste reduction, energy efficiency, and sustainable supply chain management have the potential to reduce environmental footprints while enhancing operational

efficiency and competitiveness (Surbakti et al, 2025; Omowole et al., 2024). Green technologies advancement has brought innovative practices into the manufacturing sector, leading to better approach for the achievement of sustainable development in the current business environment (Lutfi et al, 2023).

Considering the increased environmental issues awareness, GPs have become vital for business operations as they increase competitive advantage by promoting brand image, enhancing satisfaction of customer, and being adopted as a marketing strategy (Mahagamage & Perera, 2024). Environmental performance and management report around the globe revealed that more businesses and manufacturing firms are now conducting their activities in line with the sustainability standards and norms (Solaja, 2022). According to Kifordu et al, (2023), Organizations that undertake environmentally responsible practices can improve their performance by generating a wide range of opportunities, receiving variety of benefits and satisfying different needs of stakeholders. GPs implementation differs significantly across industries, with some differences influenced by firm's size and scope (Ernawati & Fauziana, 2025).

Drivers of Green Practices Adoption

Several past studies have found various groupings of drivers of adoption of GPs among SMEs. In an empirical study by Shaharudin et al, (2018), drivers that influences the GPs adoption study were identified to include compatibility, relative advantages, organisational support, human resources quality and pressure from stakeholders. Lufti et al. (2023) developed a model of the constructs that encourage SMEs in the adoption of green innovation. The model's constructs include perceived benefits, supports from top management, coercive pressure, mimetic pressure and normative pressure. Omowale et al. (2024) opined that SMEs are motivated to adopt GPs due to the associated the benefits in log-term which include cost reduction, improvement in market positioning, and compliance with emerging regulatory requirements.

According to Mwanaumo and Mwanza (2024), the drivers that drive firms to adopt GPs can be grouped into either internal and external. The major internal drivers include availability of finance, organizational policies, leadership, and employee passion towards the environment. External drivers include global demands to limit GHG emissions and environmental pollution. Shuklar et al. (2023) classified the list of drivers that encourage businesses to implement green manufacturing practices into seven categories which include organizational support, legislation, environmental knowledge, social influences, business atmosphere, innovation and monetary influences.

According to the findings of the empirical study by Jefimovaite and Vienazindiene (2022), financial costs, positive image, regulatory compliance are the drivers of adoption of green logistics practices. By combining similar constructs, Iqbal et al. (2025), classified enablers of GPs into four consisting of the legal environment, strategic intent, personal values and stakeholder pressure. Having reviewed the drivers in the past studies, the list of drivers are then grouped for the purpose of this study into five clusters, which are in line with the of the majority of the past authors namely: regulatory support, top management support, perceived benefits, stakeholder pressure and business environment.

Regulatory Support

According to Omowole et al. (2024), provision of mandatory environmental regulations by the government to businesses on mandatory engagement in proactive GPs can drive SMEs to adopt them with the aim that engaging in such practices can minimize

compliance costs and reduce the risks associated with potential legal issues. Chukwu (2020) argued that political stakeholders' commitment towards development of sustainable energy, climate change mitigation and its adaptation could be vital drivers for the green economy.

Top Management Support

Top management support is one of the key drivers of sustainable manufacturing practices as management support can inspire employees, provide financial support and a positive attitude towards sustainability initiatives (Fatoki, 2019). Top management oversees the development strategies and make decisions for sustainable development goals achievement of the firm, thus making their introduction of environmental management system adoption acceptable to the rest of the individuals within the firm (Lutfi et al, 2023).

Perceived Benefits

The perceived benefits as viewed by managers to be derived from adoption of environmental management system would promote the likelihood of its adoption and implementation (Lufti et al, 2023). Assistance from government through favourable tax incentives, as well as other programs that offer financial and technical assistance, were needed to motivate further implementation of green business practices by SMEs (Purwandani & Michaud, 2021)

Stakeholder Pressure

Stakeholder pressure includes pressure from customers, society and external parties (Iqbal et al, 2025). Rising pressure from the current and prospective customers puts external pressure on enterprises to adopt sustainable business practices. In addition, several pressures from the stakeholders and the increased demands of industries have forced manufacturers to change towards meeting ecology requirements (Huang et al, 2022).

Business Environment

Based on review of past studies, Shuklar et al (2023) posit that certain business atmospheric drivers energise green manufacturing practices implementation which include stakeholder pressure, competitive pressure, emerging opportunities in the market and business to business pressure. Similarly, Koirala (2019) reported that the commercial benefits of greening arise from the potential of increased market share and opportunity to capture new markets via eco-innovation, eco-entrepreneurship, and eco-adoption among SMEs. Environmental groups, Competitors and communities can drive the involvement of SMEs in environmental sustainability practices. Competitors promote environmental sustainability practices by introducing environmentally compliant products and processes (Fatoki, 2019).

Barriers of Green Practices Adoption

According to Chenari (2023), despite the importance of SMEs to the world economy, they face major barriers in their attempt to adopt sustainable management practices. Mahagamage and Perera, (2024) found that financial constraints, poor environmental awareness and knowledge, weak environmental laws enforcement and lack of technology constitute the major barriers to the adoption of GPs among SMEs. According to Shuklar et al (2023), eight categories of barriers of GPs were identified. These include

organisatinal structures, environmental knowledge, business atmosphere, social influences, technology, legislation, monetary influences and suppliers. Hung et al (2022) reported lack of awareness in garbage recycling, guideline, green supplier, energy, staff knowledge, convince market, lack of resources as the key barriers of GPs. The work of Nyahuna et al (2023) revealed that inadequate support from government, financial constraints, weak incentives and absence of guidance constitute the challenges for SMEs to adopt environmental management accounting. the findings by Solaja (2022) revealed that non-availability of technology, weak maintenance culture, repair and replacement cost of abatement plant, corruption and managerial issues were the major challenges to GPs implementation and environmental sustainability in Nigeria.

Based on the review of previous studies the barriers were shortlisted for the purpose of this study in four categories which include: lack of technology, inadequate finance, lack of government support and lack of environmental awareness and knowledge.

Lack of technology

Iqbal et al. (2025) posit that lack of infrastructure required for the adoption of sustainable best practices is one of the limitations that prevent a shift to the green business model. Shuklar et al (2023) identified the technology issues that limit the implementation of GPs to include shortage of new technology, lesser green manufacturing-based alternatives, complications in technical design, less flexibility in switching green manufacturing-based systems and less flexibility in executing GPs.

Inadequate Finance

Chenari (2023) posits that in the implementation of sustainable practices, SMEs face financial constraints such as initial investment costs, operational costs, access to funding, financial risk, and economic scale limitation. Mahagamage and Perera, (2024) confirmed the hindrance of financial constraints in the ability of SMEs to invest in green initiatives. The finding of Nyahuna et al, (2023) supported this view by reporting that SMEs lack the financial strength to upgrade to modern and environmentally sustainable technologies. Similarly, the finding from the study of Iqbal et al (2025) revealed that despite the potential economic benefits of green in the long run, the problems of the initial cost of implementation is a key challenge. Though financial incentives through costs savings can drive SMEs to adopt GPs, the high cost of investing in green innovations and a lack of capital may impede SMEs' resolve to green their businesses (Purwandani & Michaud, 2021). In agreement, Nkiruka and Nnoyenlu (2025) revealed that costs associated with implementing environmentally friendly measures can be unaffordable, leading to similar perceptions of financial barriers among managers of both Small Scale Enterprises (SSEs) and Medium Scale Enterprises (MSEs)

Lack of Government Support

Huang et al. (2022) emphasized that lack of government support is one the most decisive challenges in the implementation of green innovation. The study of Mahagamage and Perera (2024) indicate that weak environmental laws, lack of government support, and inadequate environmental policies have contributed to the poor environmental performance of SMEs. Aghelie (2017) argued that limited loans and budget along with lack of adequate training and consultancy by the government in support of GPs as the most critical barriers that inhibit the implementation of green business practices within small medium sized enterprises. In support of the above views, Wasiq et al (2023)

identified government support as one of the factors having positive impact on the adoption of green innovation.

Lack of environmental awareness and Knowledge

The finding of Mahagamage and Perera (2024) reflects that the lack of knowledge and awareness about green practices among SME owners, managers, and employees is a considerable barrier to sustainability initiatives. In support, Chukwu (2020) opined that poor awareness of the benefits of green economy among institutions and citizens could hampers adoption of the strategies. Hasan et al (2020) supported this view by identifying low employee knowledge, lack of green training, and lack of technical innovation and production knowledge as the major barriers that limit SMEs in their GPs implementation.

METHOD

A survey research design was used for the study. Structured questionnaire was used to collect primary data on the demographics of the respondents, and the drivers and barriers affecting GPs adoption and implementation among Small and Medium-sized Manufacturing Enterprises (SMMEs) in the Southwestern Nigeria.

A combination of convenience and purposive sampling was used to select a sample of 320 SMMEs from Lagos, Ogun, Oyo and Osun states. The combination of convenience and purposive sampling methods was adopted due to the difficulty in obtaining a total population of SMMEs in the Southwestern Nigeria as at the time of the study. The convenience sampling is a method used where the availability and easy accessibility of the units of the population are used for their selection (Bhome et al, 2013). Whereas purposive sampling is used by a researcher with the belief that the particular respondents chosen as sample represent the best estimate of the parameters of the whole (Kothari, 204). The four states were chosen due to high concentration of SMMEs in the areas. Out of the 320 questionnaires administered, only 273 were satisfactorily completed and returned. This represents a response rate of (85.3%).

Prior to administering the questionnaire, a pilot study was conducted by administering the questionnaires to 16 owners and managers from selected MSMEs to assess the reliability and validity in getting the desired outcomes. In addition, 7 experts from universities were also engaged to provide comment on the design of the questionnaire. By reviewing the past literature and seeking the views of experts through a pilot study, the study was able to develop clusters of the list of drivers and barriers that influence the adoption and implementation of green practices among SMMEs.

The drivers were divided into 5 clusters while the barriers were also divided into 4 clusters. There drivers and barriers of the adoption and implementation of green practices among SMMEs were analysed and sorted with the use of Relative Importance Index (RII). Since each cluster of the drivers and barriers has under it several drivers and barriers with varying the degrees of importance in the implementation of GPs, providing their overall ranking in the order of importance will guide the stakeholders in making decisions on them. This will help stakeholders make a priority of the drivers and barriers according to available resources and make a better plan to find solution to GPs implementation.

In line with Zulu et al. (2023), the RII for each driver and barrier variable was determined using the formula as shown:

$$RII = \frac{\sum \mathbf{W}}{\mathbf{AN}}$$

Where:

'W' is the number or weight that each respondent assigned to item on a Likert scale of 1 to 5, in which 1 represents Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Disagree.

'A' is the highest rating (5) on the Likert scale.

'N' is the total number of respondents.

The RII was computed for each of the driver and barrier variable and the ranking was done in descending order of magnitude from the highest to the lowest.

RESULTS AND DISCUSSION

Characteristics of Respondents

The respondents' characteristics provide data on the social and demographic characteristics of the respondents. Table 1 provides data on the respondents' gender, educational qualification, status and year of wok experience.

Table 1
Social-demographic Characteristics of Respondents

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	186	68.1
	Female	87	31.9
Age	20 - 30	53	19.4
	31 – 40	102	37.4
	41 – 50	76	27.8
	51 and above	42	15.4
Education qualifications	SSCE	41	15.0
	NCE/OND	64	23.4
	HND/B. Sc.	126	46.2
	Postgraduates	37	13.6
	Others	5	1.8
Status	Owner	91	33.3
	Manager	182	66.7
Work Experience in years	1 – 5	53	19.4
	6 – 10	125	45.8
	11 – 15	62	22.7
	16 – 20	19	7.0
	21 – 25	9	3.3
	26 and above	5	1.8

Source: Author's Computation, 2026

The findings on the respondents' gender as shown on table 1 showed that 68.1% were males while 31.9% were females. The reveals that there are more males as owners and managers of SMMEs in Southwestern Nigeria. On the respondents' age, it revealed that 19.4% of the respondents were young owners and managers between 20-30 years, 37.4% were between 31-40 years of age, 27.8% were between 41-50 years of age and 15.4% were between 51 years and above. This revealed there is no age barrier in owning and managing SMMEs in Southwestern Nigeria. On educational qualifications attainment of the respondents, the study revealed that 46.2% of the respondents had attained B.Sc./HND qualifications while 13.6% had reached the post graduate level. This indicates that majority of the respondents are well educated to provide reliable responses to the findings.

The status of the respondents showed that 33.3% are managers while 66.7% are owners. This category of respondents was involved because decision regarding GPs

adoption and implementation is made at the strategic level of a firm. On the years of experience of the respondents in the firms, 19.4% had spent 1-5 years in their firms, 45.8% had worked in their firms for between 6-10 years, 22.7% had worked for between 11-15 years, 7.0% had worked for between 16 - 20 years, 3.3 % have worked for between 21-25 while 1.8% had worked for over 26 years. This indicates that 80.6% representing the majority of the respondents had spent above 5 years in their respective firms which is considered a period long to acquire business knowledge that make them capable of providing information for the findings.

Drivers of Green Practices

Table 2 presents the result of the ranking of the listed drivers of Green Practices using Mean and Relative Importance Index (RII).

Table 2
Drivers of Green Practices

Drivers	N	∑W	Mean (X)	A	RII	Rank
Regulatory Support						
Voluntary regulations and Standards on GPs	273	901	3.3004	5	0.6601	21
Mandatory GPs regulations by the Government.	273	1,112	4.0733	5	0.8147	1
Non-mandatory Corporate Social Responsibilities for GPs required by the government	273	1,062	3.8901	5	0.7780	17
Environmental regulations in place by other countries to secure international business	273	703	2.5751	5	0.5150	22
Top Management support						
Top management aligning firm's strategy to environmental issues and performance.	273	1,089	3.9890	5	0.7978	8
Commitment of adequate resources to GPs by the top management	273	1,097	4.0183	5	0.8037	4
Top management Encouraging employees' commitment to GPs through	273	1,093	4.0037	5	0.8007	6
Developing good community relations in support of GPs	273	1,060	3.8828	5	0.7766	18
Developing organisation culture supportive of GPs	273	1,093	4.0037	5	0.8007	6
Formulating supportive policies and strategies for GPs	273	1,099	4.0256	5	0.8051	3
Perceived Benefits						
Financial incentives from Governments for GPs adoption	273	1,102	4.0366	5	0.8073	2
Innovation opportunities through green products	273	1086	3.9780	5	0.7956	10
Perceived costs reduction through GPs	273	1080	3.9560	5	0.7912	13
Improved competitiveness through GPs	273	1087	3.9817	5	0.7963	9
Building better firm's reputation through GPs	273	1076	3.9414	5	07882	14
Stakeholder pressures						
Customers pressure for green products and services	273	1,076	3.9414	5	0.7882	14
Public Awareness of green initiatives	273	1,072	3.9267	5	0.7853	16
Collaboration by customers for GPs	273	673	2.4652	5	0.4930	24
Demand from shareholders and investors	273	702	2.5714	5	0.5143	23
Business Environment						
Pressures from competitors towards GPs	273	1,095	4.0110	5	0.8022	5
Profession network support for GPs	273	1048	3.8388	5	0.7678	19

New opportunities in the market towards GPs	273	1086	3.9780	5	0.7956	10
Industrial Sectors GPs initiatives	273	1041	3.8132	5	0.7626	20
Environmental uncertainty	273	1083	3.9670	5	0.7934	12

Source: Authors' Computation, 2026

The results in table 2 revealed that there are several drivers of green practices among SMMEs. Among the top key drivers, mandatory GPs regulations by the government (RII =0.8147) ranked highest. This was followed by financial Incentives from the governments (RII = 0.8073). The next was formulation of supportive organizational policies (RII =0.8051). Management commitment of adequate resources to GPs by the top management (RII = 0.8037) ranked fourth while pressures from competitors towards GPs (RII =0.8022) ranked fifth.

On the other hand, collaboration by customers for GPs (0.4930) ranked lowest among the drivers of adoption of GPs by SMMEs in Nigeria. other lowly ranked drivers include: non-mandatory corporate social responsibilities requirement for GPs (RII = 0.7780) industrial sectors GPs initiatives (RII =), development of good community relations in support of GPs (RII = 0.7766), profession network support for GPs (RII = 0.7678), industrial sectors GPs initiatives (RII = 0.7626), voluntary regulations and standards on GPs (RII = 0.6601), Environmental regulations in place by other countries to secure international business (RII = 0.5150) demand from shareholders and investors (RII = 0.5143). These drivers ranked 17th, 18th, 19th, 20th, 21st 22nd and 23rd respectively on table 2.

As reported by previous studies (Zulu et al, 2022; Lufti, et al, 2023; Mei, 2023; Shukla et al, 2023; Wasiq et al, 2023), mandatory government environmental regulation is one of the most critical drivers influencing managers' adoption and implementation of GPs. This view is also supported by Iqbal et al. (2025) who opine that SMEs are compelled to adopt green innovation through regulatory pressure. Many SMEs may decide not to implement green practices due to the belief that it may lead to increased cost in terms of staff training and purchase of additional equipment. As a result of this belief, strict enforcement of mandatory rules and regulations on environmental practices may be required from the government to enforce implementation.

Based on the result of Mei (2023) perceived economic benefit in form of financial incentives from governments has a positive relationship with the adoption and implementation of green business practices. In a situation where government provides benefits such as tax incentives and other types of incentives to encourage firm's adoption of green practices, it is believed that many SMEs due to their limited financial resources, will be motivated to implement the practices as a way of achieving cost efficiency to boost profit. In line with the above view, Nyahuma et al (2023) opined that without these supports and incentives from the government, SMEs due to their limited resources nature may find it difficult to engage in environmental management matters.

Two variables in the cluster of the top management support: formulating supportive organizational policies for GP and commitment of adequate resources to GP, ranked 3rd and 4th respectively. The high influence of supportive organizational policies and strategy as a driver in the implementation of green practices is in line with the view of Lufti et al (2023) that management support by integrating corporate strategy with environmental matters is a crucial driver in committing firm's resources to the achievement excellent environmental performance. This is due to influence of the top management in the organizational policy and strategy choices. Regarding the commitment of adequate resources to GP, the high ranking concurred with the opinion of

Shaharudin et al. (2018) who argued that support from the top management by providing the required resources for innovation will serve as a key incentive to provide the motivation requires for successful implementation of GPs. This revealed that support from the top management by ensuring adequate availability of resources needed for green practices will offer the inspiration that will make employees to be highly committed to successful green practices implementation.

Pressure from competitors also ranked high in driving the implementation of GPs among SMMEs. The result is supported by Fatoki (2019) who opined that by introducing products and processes that are environmentally compliant by competitors influence the adoption environmental sustainability practices.

Barriers of Green Practices

Table 3 presents the results of the ranking of the listed barriers of Green Practices using Mean and Relative Importance Index (RII).

Table 3
Barriers of Green Practices

Barriers	N	∑W	Mean (X)	A	RII	Rank
Technological constraints						
Lack of assess to latest technology to support GPs due to cost	273	1,101	4.0330	5	0.8066	9
Lack of additional infrastructures require in support of GPs	273	1,099	4.0256	5	0.8051	11
The complexity of design in support of GPs	273	1,081	3.9597	5	0.8117	14
Less flexibility in switching to GP-based systems	273	1,106	4.0513	5	0.8103	5
Inadequate R&D, design and testing within the organization to support GPs	273	1,071	3.9231	5	0.7846	17
Financial Constraints						
Difficulty in raising fund for GP initiatives	273	1,101	4.0330	5	0.8066	9
An extensive amount of budget was required for investment in green technology and supporting infrastructures	273	1,105	4.0476	5	0.8095	6
Research and Development training and implementing costs	273	1,076	3.9414	5	0.7883	16
High cost of implementing environmental practices	273	1,115	4.0842	5	0.8168	2
Lack of Government support						
Weak environmental law enforcement for GPs	273	1,074	3.9341	5	0.7868	15
Lack of policies/guidelines from regulatory bodies on GP implementation	273	1,109	4.0623	5	0.8125	4
Lack of training provided by the government on GPs	273	1,102	4.0366	5	0.8073	8
Non-availability of financial incentives for GPs implementation	273	1,112	4.0733	5	0.8147	3
Lack of environmental awareness and Knowledge						
Lack of awareness of sustainability issues and their benefits among employees	273	1,118	4.0952	5	0.8190	1
Lack of accessibility to data on GPs	273	1,087	3.9817	5	0.7963	13
Lack of regular and specific information on what to do and for potential improvement	273	1,103	4.0403	5	0.8081	7
Limited knowledge on sustainable technologies	273	1,093	4.0037	5	0.8007	12

Source: Authors' Computation, 2026

In case of the barriers that obstruct the adoption and implementation of green practices in SMEs, table 3 reveled that lack of awareness of sustainability issues and

available programmes (RII = 0.8190), high cost of GPs implementation (RII = 0.8168), Non-availability of financial incentives for GPs implementation (RII =0.8147), lack of policies/guidelines from regulatory bodies on GPs implementation (RII = 0.8125) less flexibility in switching to GP-based systems (RII = 0.8103) are the most significant barriers that hinders the implementation of green practices among SMEs.

The result obtained from the ranking revealed that lack of awareness of sustainable issues is the most significant barrier that militates against GPs implementation. Several studies (Mahagamage & Perera, 2024; Nkiruka & Nnonyelu, 2025) shows that lack of information on GPs among SMEs' owners, managers and employees is a significant barrier towards GPs implementation. In the same vein, the findings of chukwu (2020) revealed that lack of awareness on the part of the public on GPs and how they could lead to the achievement sustainable development goal, constitute a significant barrier in their adoption. Some SMEs, due to their informal nature of operation have some negative perceptions about GPs being a new concept in Africa.

High financing cost associated with the implementing environmental practices, has also been identified as barrier limiting GPs implementation among SMEs. (Mahagamage & Perera, 2024, Fatoki, 2019) found that difficulty associated with raising fund to finance the cost of implementing GPs as the one of the significant barriers working against their adoption and implementation. Solaja et al. (2020) also echoed this view by recognising adoption cost as one of the obstacles of GPs adoption among SMEs. In the same view, Nyahuna, eta al., (2023); Zulu et al, (2022); Jefimovaite & Vienazindiene, (2022) found that lack of adequate funds to finance the cost of implementing green initiatives constitute a major barrier that hinders their adoption and implementation. Huang et al. (2022) considers financial capability constraints as one of the most decisive challenges to green innovation in the manufacturing sector. A common problem of SMEs around the world especially in developing countries is inadequate capital and inability to raise large amount of funds from long-term capital sources unlike large enterprises. This finance barrier has always been a cog in the wheel of SMEs in their attempt to adopt and implement innovation.

Another barrier that also rank high in the adoption of in the adoption of GPs lack of policies/guidelines from regulatory bodies on GPs implementation. This is consistent with opinion of Agboola et al. (2023) which posited lack of institutional policies and guidelines is one of the top-ranked barriers militating against the adoption of green practices in the building sector. In support, the study of Shukla et al (2023) revealed lack of guidelines for implementation of GPs as one of the major barriers preventing its adotption.

Non-availability of financial incentives for GPs implementation was also revealed as a barrier inhibiting the implementation of GPs among SMMMEs in Southwestern Nigeria. This view was validated by the study of Onososen et al. (2019) who identified lack of government support in the form of financial incentives to drive green building adoption as one of the barriers working against its adoption.

The less flexibility of SMEs in switching to GP-based systems was also found to be a major barrier that limit the capability of these organization in the GPs implementation. Majority of SMEs lack both multiskilled employees and multitasked equipment to cope with any sudden change in technology, and this factor serves a stumbling block in their ability to adopt new a technology. This finding is in line with Shukla et al, (2023) who identified lack of flexibility to switch to GMP based technology as a key barrier in implementing GPs.

CONCLUSION AND SUGGESTION

The aim of this study is to find out the key drivers and barriers that respectively enable and obstruct the implementation of GPs among SMMEs in the context of a developing economy in Africa. By reviewing the past literature and seeking the views of experts through a pilot study, the study was able to develop clusters of the list of drivers and barriers that influence the adoption and implementation of GPs among SMEs. The drivers were divided into 5 clusters while the barriers were divided into 4 clusters. The clusters of the drivers include: regulation, top management support, perceived benefits, stakeholders' pressure and business environment. The clusters of the barriers include: technology constraints, financial constraints, lack of government support and lack of environmental awareness and knowledge. Further, with the use of Relative Important Index method of analysis, the study was able to obtain an overall ranking results of the items in list of drivers and barriers in the clusters.

The study concluded that provision of mandatory GPs regulations is the most significant driver enabling the implementation of GPs by SMEs. Furthermore, the study also identified other significant drivers that support SMEs' implementation of GPs. These include financial Incentives from the governments, formulation of supportive organizational policies, Management commitment of adequate resources to GPs by the top management and pressures from competitors towards GPs.

The most significant drivers as revealed can be used by SMEs to overcome the challenges that may obstruct their efforts to adopt green business practices. Aside enhancing their capability of adopting green business practices, these enabling influential drivers will also assist SMEs in the adoption of innovation and improve their competitive performance.

Regarding the barriers to the implementation obstructing the implementation of GPs among SMEs, the study concluded that lack of awareness of sustainability issues and available programme is the most significant barrier that militates against GPs implementation among SMEs. The study further found high cost associated with the implementing environmental practices, non-availability of financial incentives for GPs implementation lack of policies/guidelines from regulatory bodies on GPs implementation and less flexibility in switching to GMP-based systems as other key barriers that limit the implementation of GPs among SMEs. The findings of this provide empirical information on the drivers and barriers that serve as motivators and challenges respectively in the efforts of SMMEs to adopt and implement GPs in the context of a developing country.

To ensure that the Nigerian SMMEs also play a key role in the global sustainable development goals while bolstering the country's economy through their enhanced social, economic and environmental performance, government should provide encouraging financial incentives such as tax incentives, subsidies and grant for procuring green technologies to SMMEs that are making efforts to go green or have implemented green initiatives. Through this, SMMEs in the country would be greatly motivated to adopt green business practices. Government and other stakeholders in SMEs sector should engage in environmental awareness campaign aiming to improve understanding of the various benefits of sustainability practice among SMMEs and promote their positive mindset towards pro-environmental issues. In addition, there is also need for government to strengthen the legal framework with specific laws that mandate the implementation of GPs by all firms in the country regardless of size of firms.

Stakeholders, such as government, professional networks and consumers protection agencies should regularly orientate the consumers on the benefits of GPs and

the importance of increasing their patronage of eco-friendly products. This will increase competition on the part SMMEs by seeing their standing out as producers of eco-friendly products as a way to make them retain their existing customers and win more potential customers.

The top managements of SMMEs should formulate policies that support implementation of GPs and commit adequate organizational resources towards the implementation of green initiatives. Government, top management and other stakeholders should establish regular training programmes, workshops and seminars as well as creation knowledge sharing platforms on sustainable technologies to enhance the capabilities of SMMEs employees and promote their interest and support in the adoption of GPs.

For future research, it is suggested to focus on large size businesses or other sectors apart from the manufacturing sector. In addition, due to the regional economic, social and cultural differences among the six regions in the country which may limit the application of the result of this study to the entire country, it is also suggested to replicate the study in other regions aside the Southwestern region of Nigeria. Furthermore, researcher in the future are encouraged to use a random sampling method when a verifiable population exists to obtain a more accurate result. Finally, conducting further study with the use of qualitative data obtained from interview or with usage of a mixed method involving both questionnaire and interview would be an important step taken to validate the findings of this study.

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