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Evaluation of the Perception and Adoption of Environmental Management System in Small and Medium Enterprises in the Manufacturing Sector in Lagos and Ogun States, Southwestern Nigeria

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ABSTRACT: The objective of this paper was to evaluate the perception and adoption of environmental management system in small and medium enterprises in the manufacturing sector in Lagos and Ogun States, Southwestern Nigeria using appropriate standard techniques. The paper posits that environmental management literacy and advocacy should be carried out in SMEs. Environmental management practices involve engaging both industries and product end-users in sustainable practices. The paper concludes that the implementation of environmental management practices and culture by SMEs will abate environmental pollution and its concomitant health risks to humans, the environment, flora, and fauna. Mandatory and voluntary environmental measures 3 are suggested as a means of engendering eco-friendly innovation for sustainable development, triggering employment, job security, and gross domestic product.

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Small and medium enterprises (SMEs) are pivotal to economic growth and development in developing and emerging nations (Obi *et al.,* 2018; Ndiaye *et al.,* 2018). In emerging economies, SMEs contribute approximately 45% of total employment and 33% of GDP (OECD, 2017). In low-income countries, they account for 78% of all employment but only contribute 16% to GDP (Dalberg Global Development Advisors, 2011). This significant discrepancy highlights the untapped potential and the critical need for supportive policies and financial frameworks to enhance their productivity and overall economic impact. In Nigeria,

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SMEs are major contributors to the manufacturing sector, contributing about 14% of the total manufacturing contribution to GDP (Oyelaran-Oyeyinka, 2012). Distributed in clusters within industrial zones, this sector is the largest contributor to GDP after crude oil. However, it also has significant ecological footprints, impacting citizens' health, the environment, and the economy. SMEs, particularly those in the chemical, automotive, electronics, pulp, and paper industries, produce mo re hazardous substances per unit of output than larger industries. These emissions exacerbate global warming and climate change (Omoyajowo *et al.* 2022, 2024). This raises a question about the discord between the developmental objectives of inclusive growth and the environmental management practices required of SMEs in a green economy. Despite their economic and environmental significance, SMEs in Nigeria show poor environmental policy literacy and awareness. Unlike multinational corporations (MNCs), which are more committed to green economy policies, SMEs focus mainly on survival and profitability (OECD, 2009a). This difference is largely due to the lack of understanding that environmental management can improve corporate performance and competitiveness. Additionally, limited access to information, training, and resources further hampers SMEs' ability to integrate sustainable practices, underscoring the need for targeted educational and financial support to bridge this knowledge gap. There is a notable gap in the study of the ecological and carbon footprints of SMEs in Nigeria. Unlike in countries like the United Kingdom and France, where SMEs' environmental impacts are well-documented (Malmborg, 2006; Daddi *et al.,* 2010), Nigerian SMEs often do not conduct environmental audits. Regulatory organizations struggle to accurately determine SMEs' pollution contributions due to inadequate monitoring and support system (Omoyajowo *et al.,* 2022a). A recent survey revealed that less than 6% of 120 Nigerian SMEs were aware of their environmental impact (PwC─Nigeria, 2020). This highlights a significant environmental management deficit and a lack of awareness of Sustainable Development Goals (SDGs). Many SMEs believe their small size renders their environmental impact negligible, demonstrating ignorance of their role in achieving sustainable development. Environmental sustainability for firms, particularly SMEs, involves adopting sustainable practices that ultimately minimize negative environmental impacts while enhancing operational efficiency and competitiveness, building resilience for tomorrow's business and environmental landscape (Olalekan *et al,* 2019; Omoyajowo *et al.,* 2023). This includes reducing energy consumption, minimizing waste, adopting renewable energy sources, and ensuring sustainable sourcing of materials. For SMEs, embracing environmental sustainability can lead to cost savings through energy efficiency, improved market opportunities as consumers increasingly prefer eco-friendly products, and compliance with regulations that support environmental sustainability (Omoyajowo *et al*, 2023, 2024). Moreover, integrating environmental management system like the ISO 14001 into business strategies can enhance SMEs' resilience against environmental risks and improve their reputation among stakeholders. Programs that offer training, resources, and financial incentives are crucial to support SMEs in this transition. By fostering a culture of sustainability, SMEs can not only contribute to broader environmental goals but also secure long-term economic benefits and competitive advantages (Ajibola *et al.,* 2020, Olalekan *et al,* 2019; Omoyajowo *et al,* 2024). Against this backdrop, this paper assesses the perception and adoption of Environmental Management Systems, particularly ISO 14001, among SMEs in Nigeria. Through an exploration of awareness and implementation of environmental management practices within Nigeria's SME sector, this study seeks to pinpoint the challenges and opportunities associated with SMEs aligning with international sustainability standards. Consequently, this paper serves as a reference for governments and sustainable development partners to formulate policies and initiatives aimed at encouraging SMEs to adopt sustainable practices. Such practices not only facilitate compliance with global standards but also enhance opportunities for growth and resilience amidst evolving economic and environmental dynamics. Hence, the objective of this paper was to evaluate the perception and adoption of environmental management system in small and medium enterprises in the manufacturing sector in Lagos and Ogun States, Southwestern Nigeria

MATERIALS AND METHODS

In evaluating the perception and adoption of the Environmental Management System, mainly ISO 14001, by SMEs in Nigeria, one hundred and fifty (150) SMEs in the manufacturing sector were randomly sampled in Lagos and Ogun State, Southwestern Nigeria. The term "SMEs" used in this study is subsumed within the context of size. This suggests that only manufacturing firms with staff strength of less than 300 were considered. A questionnaire was administered to the Production or General Manager in each of the one hundred and fifty manufacturing firms. The questions were based on the awareness of ISO 14001, the practice of ISO 14001 by the firms, and barriers to EMS adoption, amongst others. One hundred and twenty questionnaires were retrieved, analyzed using SPSS, and presented as

simple percentages and charts. The ethical consent of respondents was sought before they enlisted in the study. The questionnaire was designed based on a comprehensive review of existing literature on EMS adoption among SMEs. To ensure the reliability and validity of the questionnaire, we conducted a pilot test with 10 SMEs that were not part of the main study. Feedback from the pilot test was used 9 to refine the questions for clarity and relevance. The sampling method employed was simple random sampling to ensure that all SMEs in Lagos and Ogun State had an equal chance of being selected. We achieved a response rate of 90%, with 144 out of 150 questionnaires returned. Nonresponses were followed up with phone calls and emails to minimize bias. The data collected from the questionnaires were analyzed using SPSS version 25. Descriptive statistics, including frequencies and percentages, were used to summarize the data. Graphs and charts were generated to visually represent the key findings.

RESULTS AND DISCUSSIONS

The adoption and implementation of EMS by small-scale manufacturing firms in developing countries are faced with several constraints and barriers. These barriers could be broadly categorized into those that are external to the firm and internal to the firm (Milieu Ltd. and Risk and Policy Analysis Ltd., 2009). These include factors ranging from the cost of implementation, lack of support and guidance, and other drawbacks linked to the institutional framework and the lack of market recognition of EMS. The public does not recognize EMS adoption or ISO 14001 certification, resulting in low customer awareness and a lack of recognition by public institutions as factors impeding organizations' desire to adopt a formal EMS like ISO 14001. This aligns with Iraldo *et al.,* (2009); Jaffe and Palmer (1997), who identified that cost and lack of recognition are significant barriers. Our findings confirm these earlier studies and add that the lack of market pull for green products exacerbates this issue in Nigeria. Fig. 1 shows that only 20% of manufacturing firms recognize the importance of ISO 14001 certification, while the other 80% do not. The reasons for this may be due to a lack of awareness of EMS by SMEs, poor interactions with global brands, and the failure of relevant government agencies to sensitize stakeholders on the need to adopt and implement EMS. Similarly, Figure 3 reveals that the cost of implementation is a major barrier for SMEs, considering their limited financial resources (Iraldo *et al*., 2009; Jaffe and Palmer, 1997). These costs may include expenditures on technical measures such as the cost of green technology equipment, plant management, control, and maintenance. The fear of spending on external consulting may also hinder these firms from adopting an environmental management system, as they are primarily focused on making profits.

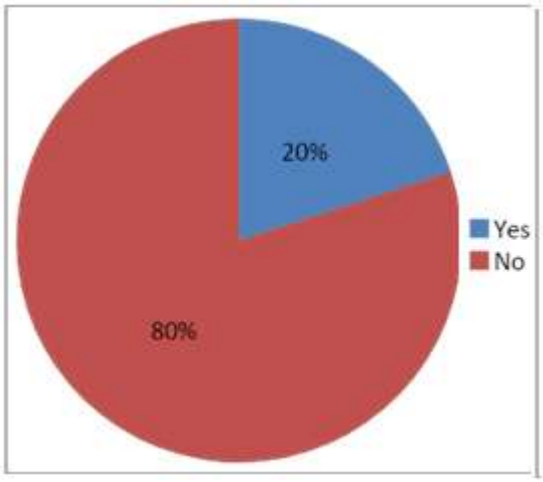

Fig. 1: Recognition and Importance of ISO 14001 Certification by firms

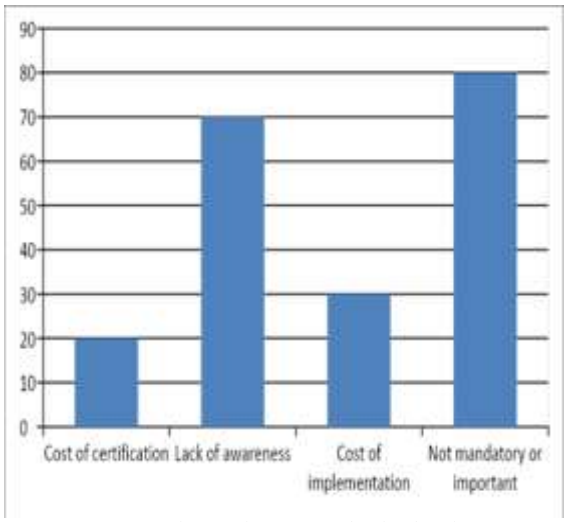

Fig. 2: Barriers against EMS Adoption by Firms

Internal barriers: Internal barriers to EMS implementation in SMEs are obstacles that arise within the firms and prevent the adoption of EMS (Patton and Baron, 1995). These include factors such as time and human capital, difficulties in understanding and perceiving the EMS scheme, and the environmental culture of the organization. Lack of time, lack of staff resources, and lack of know-how deter EMS implementation in SMEs, which confirms the findings of Bocconi *et al.*, (2006). A worrisome barrier to the adoption of EMS is the fear of disclosing certain environmental non-compliances that would have otherwise remained uncovered. Therefore, the fear of having to sustain higher costs of penalties

instead of saving money because of the implementation of the EMS may prevent SMEs from adopting ISO 14001. This concern is in line with findings by Rennings *et al.,* (2006), who noted that fear of regulatory scrutiny can deter EMS adoption.

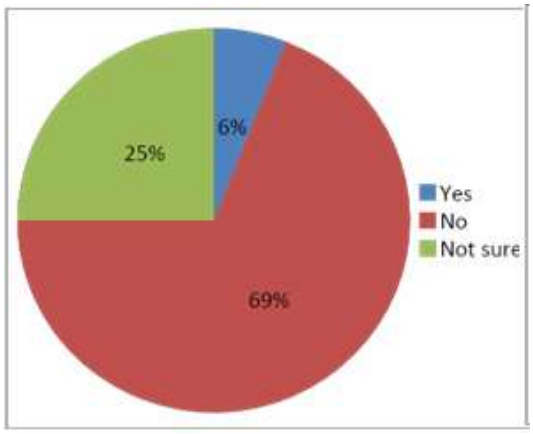

Fig. 3: Adoption and Implementation of EMS in Manufacturing Firms

Similarly, the lack of eco-management-targeted skills or human resources is a barrier that SMEs are faced with when deciding to implement an EMS (ISO 14001). Figure 4 revealed that only 6% of SMEs sampled adopted and implemented EMS, while Figure 5 indicated that more than 65% of SMEs do not practice any environmental policy. This lack of practice indicates a significant gap in environmental management, largely due to the difficulties in understanding ISO 14001 and the lack of resources to implement it, as suggested by Bocconi *et al.,* (2006). Most SMEs do not, as a matter of necessity, carry out accurate analyses of their companies' activities in the environment due to a lack of resources and technical know-how. The firms are more concerned with the technical (business) aspects of their organisations. Nonetheless, few SMEs are acquainted with instruments and methodologies for environmental impact measurement and assessment; however, these SMEs lack the time and technical resources to carry out in-depth analysis on their own (Patton and Baron, 1995). This practice may hinder EMS adoption and environmental management policy implementation. In addition, most SMEs in Nigeria do not have a robust environmental management framework; thus, the companies are disenchanted with the process of structuring their environmental management system from scratch, which is required in adopting and implementing EMS. In addition to this, there is the complex documentation of ISO 14001, which may hinder the adoption of EMS by SMEs. This is because most of these firms lack the technical know-how and structure to implement ISO 14001. Most SMEs in Nigeria do not appreciate the importance of having an environmental statement besides their vision and mission. This indicates a lack of concern for the impact of their activities on the environment. A survey conducted by the authors, as shown in Figures 3 and 4, reveals that a larger percentage of these firms are ignorant or indifferent to policies on environmental sustainability. Unfortunately, such policies are deemed unnecessary for their business operations. This view is accentuated by Figure 6, as only 30% of the SMEs are fully aware that their activities impact the environment and the ecosystem. This could be linked to the general indifference of the public about the implications of SMEs' activities on the environment and the general poor environmental culture in the manufacturing sector.

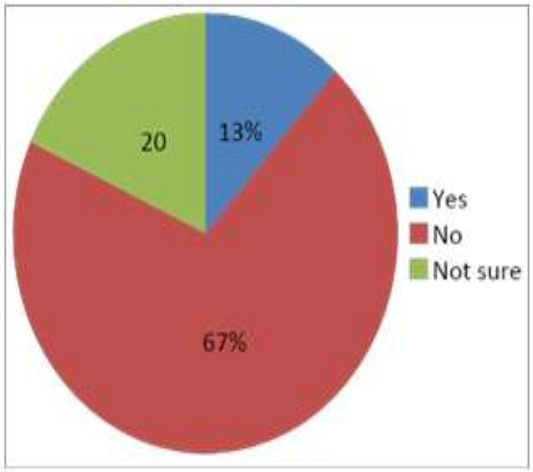

Fig. 4: Practice of Environmental Policy by SMEs

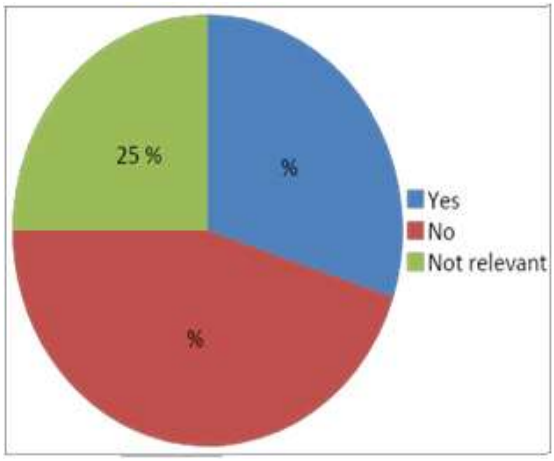

Fig. 5. Firm's Awareness of its Environmental Impact on the Environment

Benefits of EMS Adoption and Implementation by SMEs: Environmental sustainability is becoming a global concept as economies and organisations become conscious of the impacts of industrial

activities such as global warming, climate change, biodiversity depletion, and epidemics while putting measures in place to stop or reduce them. Companies in developed economies find it imperative to align with the report of the Intergovernmental Panel on Climate Change (IPCC) on protecting the environment. SMEs in Nigeria can also derive great benefits if they adopt and implement an environmental management system like ISO 14001, as it raises the organizational and management efficiency of the company (Rennings *et al.,* 2006). This means the adoption and implementation of ISO 14001 by SMEs will improve their capacity to manage and control their environmental performance by continuously monitoring their processes and output flow through procedural and operational control. By improving the skills and raising the awareness of the personnel on environmental management standards, SMEs can obtain positive management results in terms of consistent plan-do-check-act (PDCA) by tracking the EMS measurable for total quality management. Another benefit of adopting and implementing ISO 14001 is local and global recognition; it projects the firm as a responsible corporate organization committed to environmental sustainability (Abdul-Rahman *et al*., 2012). In summary, the benefits of ISO 14001 for small-scale firms could either be direct or intangible. The direct benefits include (i) material savings through more complete product input processing, substitution, and recycling of by-products and waste. (ii.) reduced energy consumption. (iii.) Reduced material storage costs. (iv.) reduced costs for emissions, discharges, waste handling, transport, and disposal. (v.) increased process yields; (vi.) reduced insurance rates. (vii.) reduced environmental liability. (ix.) reduced enforcement fines. The intangible benefits may include (i) improved corporate image among regulators, customers, and the public. (ii.) proof of social responsibility (iii.) improved employee morale. An Environmental Management System (EMS) is considered a beneficial tool for organizations that wish to integrate environmental management into the overall corporate management system, not only to comply with existing regulations but also to consider and eventually respond to changing knowledge and technology (Bansal and Bogner, 2002). The most frequent actions within environmental planning regarding the improvement of production processes and energy efficiency or energy production, are considered the safest ways to achieve cost reductions. These investments already appear to be typical components of EMS programs (Gasbarro *et al.,* 2013). However, the other issue that rests on environmental planning is leadership and commitment. ISO 14001 provides a systematic and holistic framework for managing environmental impacts, ensuring legal compliance, and fostering continual improvement, requiring top management to demonstrate leadership and commitment by integrating the EMS into business processes and promoting environmental awareness. Recent findings underscore the link between leadership, commitment, spiritual consciousness, and environmental responsibility, refocusing the impetus for effective and positive change and offering strategies for broadening environmental stewardship (Omoyajowo *et al.,* 2023).

Government Roles and Support for SMEs in Implementing EMS: Regulatory obligations and other external pressures, such as social pressure, may induce the adoption and implementation of ISO 14001 in Nigeria. SMEs could adopt and implement ISO 14001 to comply with increasing legal requirements (Jenkins R. 1998). Hence, agencies of government such as SON and NESREA should implement an EMS such as ISO 1400 in the operational activities of SMEs for improved environmental performance. More so, awards and national recognition should be given to companies that have successfully implemented environmental management systems in a "cradle to grave" approach in their firms' processes and output flow. This means that an environmental performance index or indicators should be designed to measure each SME's efforts. The government should also come up with policies that will provide technical support to SME personnel in the adoption, documentation, implementation, and review of ISO 14001. SMEs have always lacked adequate financial support from the government; financial and economic incentives should be provided to facilitate their ISO 14001 certification in terms of giving discounts or tax rebates to encourage SMEs to adopt it for a sustainable environment.

Implications for Policymakers, SME Owners and Other Stakeholders: Our findings highlight several implications for policymakers. First, there is a need for greater awareness and education programs to increase understanding of the benefits of EMS among SMEs. Government agencies should work closely with SMEs to simplify the certification process and reduce associated costs. Providing financial incentives, such as subsidies or tax breaks, can also encourage SMEs to adopt EMS. Policymakers should also focus on improving the regulatory framework to enforce environmental standards while providing support to SMEs for compliance. This dual approach can ensure that SMEs are both aware of the regulations and capable of meeting them. For SME owners, the study underscores the importance of integrating environmental management into their business strategies. Owners should seek out training

opportunities and resources to better understand and implement EMS. By doing so, they can not only improve their environmental performance but also gain a competitive edge in both local and international markets. Owners should also consider the long-term benefits of EMS adoption, such as cost savings from improved efficiency, better compliance with regulations, and enhanced corporate image. These benefits can offset the initial costs and challenges associated with EMS implementation. Other stakeholders, including industry associations, NGOs, and consumers, play a crucial role in promoting EMS adoption (Ajibola *et al,* 2020; Olalekan *et al,* 2019). Industry associations can provide a platform for knowledge sharing and collaboration among SMEs. NGOs can assist with training and advocacy, helping to raise awareness of the importance of environmental management. Consumers can drive demand for environmentally friendly products, encouraging SMEs to adopt sustainable practices.

Conclusion: The environmental policy for SMEs needs to be geared towards the promotion and adoption of cleaner processes and product technologies. In practice, EMS (ISO 14001) provides the requisite platform to ascertain, define, and activate the technological, technical, and organizational opportunities existing in SMEs that can be used to prevent or resolve environmental problems. As earlier noted, SMEs still must contend with several hindrances ranging from internal to external obstacles in their adoption of environmental management systems (ISO 14001). These obstacles relate to their size, technical know-how and/or personnel expertise, financial resources, and management structure in the understanding, adoption, documentation, and implementation of ISO 14001.

Declaration of Conflict of Interest: The authors declare no conflict of interest

Data Availability Statement: Data are available upon request from the corresponding author.

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