Journal of Accounting and Economics
https://greenresearchng.com/11.4/GR32262779
Research Paper | Open Access

Green Research
Received 18 Nov 2025
Accepted 02 December 2025

ECO-INNOVATION, GREEN PRACTICES, AND PERFORMANCE OUTCOMES AMONG OIL-PRODUCING COMPANIES IN SOUTH-SOUTH NIGERIA

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ABSTRACT

This paper has analyzed the linkage between eco-innovation, green practices, and performance in oil producing firms in South-South Nigeria. The study sought to find out the effects of sustainable management practices on organizational productivity, efficiency and environmental responsibility in the oil sector of the region. Data collection was done using a survey research design on 252 respondents who were sampled among the oil-producing firms. The data were done with descriptive and inferential statistical procedures to determine the nature and strength of the relationship between the variables. Results found that environmental innovation and green practices have a great impact on organizational performance as they increase efficiency in the use of resources used, minimizing environmental hazards, and creating corporate identity. This paper also demonstrated that a company with cohesive ecological and environmental management systems and technologies is more inclined to enjoy long-term competitiveness and operational excellence. It concludes by stating that sustainable activities are not just needed to help the environment, but also economical to oil producing companies in Nigeria. The research suggests that a company should institutionalize green management structures, invest in innovation-based sustainability initiatives, and enhance its partnership with the environmental departments to ensure that the industrial activities in the area are clean and more responsible.

Keywords: Eco-innovation, Green Practices, Organizational Performance and Sustainability

1.0 Introduction

Green management has been a core issue of interest in academic and business circles in the quest to come up with sustainable business practices. Green management focuses on the practices that are environmentally friendly, eco-innovation, and sustainability strategies that reduce the negative impact of industrial activities on the environment (Hage and Taruna, 2016). The necessity of its increase is supported by the increased need in the environmental responsibility, corporate responsibility, and the ecological systems preservation (Lannelongue, Gonzalez-Benito & Gonzalez-Benito, 2013). The notion of green management is especially important in the oil and gas industry because it is one of the primary polluters of environmental degradation through oil spills and gas flaring as well as deforestation and loss of biodiversity (Opukri & Ibaba, 2008). This renders the South-South of Nigeria with most of the oil producing companies in the country a center of interest in research concerning the collision of industrial activities, the environmental sustainability and organizational outcome.

Although the world is shifting towards being more sustainable, there are still numerous oil producing companies in Nigeria that are faced with the issue of embracing green practices. Factual data indicate that the sector generates

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Green Research
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approximately 90 percent of the national income and at the same time causes serious environmental destruction, which results in socio-economic issues like poverty, youthful restlessness and poor health results in South-South (Omorogbe, 2016). The ecological impacts of pollution in this area are not limited to the damage of agricultural lands and fishing industries but go to even greater levels, such as the undermining of livelihoods and community health (OECD, 2011). Although researchers have observed that green management has the potential to minimize such adverse externalities and improve the productivity of firms (Dhull and Narwal, 2016; Kassinis and Soteriou, 2008), the adoption of green management is being hampered by high costs, ineffective infrastructure, lack of awareness and institutional enforcement (Jayant and Azhar, 2014). Accordingly, there is a gap to empirically investigate the extent to which green management practices have an influence on the sustainability of organizations operating in the oil industry in South-South Nigeria. The general aim of the given research is to investigate the impacts of sound green management on organizational sustainability among the selected oil producing companies in South-South Nigeria. Precisely, the proposed research will focus on: (i) investigating the impact of green innovation on organizational productivity and (ii) investigating the impact of eco-friendly practices on organizational performance. In order to respond to these objectives, the study shall give the responses to the following research questions: What is the impact of green innovation on the productivity of the chosen oil-producing firms in South-South Nigeria? What is the impact of the eco-friendly practices on organizational performance of such firms? There are multidimensional values of the study. To the management in the oil industry, the results will be actionable information on the adoption of green management systems which can positively contribute to productivity and competitiveness in the globalized economy which is increasingly becoming green with regard to environmental requirements. The study will also help policymakers and the government agencies in designing and establishing regulations to facilitate environmentally-friendly operation and sustainable economic development (Walker, Sisto & McBain, 2008). The study will be relevant to environmental analysts and researchers in enhancing the body of knowledge on the practices of green management, as well as bridging empirical gaps on the Nigerian oil industry. Notably, the study has some practical implications to the communities within the South-South region whereby, the results of corporate environmental practices have direct impacts on socio-economic well-being.

The study is also limited in scope to the selected oil-producers that exist in south-south Nigeria, such as the ExxonMobil, Agip Oil Company, Chevron/Texaco, Pan Ocean Oil Corporation, Eterna oil and gas and Belemaoil Producing Limited. The content area will focus on how green innovation and environmentally friendly practices affect organizational productivity, performance, efficiency, and sustainability. Geographically, the research is conducted on six states Akwa Ibom, Bayelsa, Cross River, Delta, Edo and Rivers that are geographically located in the Niger Delta which is the geographical center of the oil wealth in Nigeria but the most ecologically challenging area in the country.

The research by itself is not devoid of limitations. The organizational bureaucracy and the unwillingness of the employees to fully interact with survey tools made the access to data of oil firms difficult. The time limit was also a factor that influenced the speed of data collection, which was complicated by national problems, including security problems, the COVID-19 pandemic, and extended industrial strikes of the Academic Staff Union of Universities (ASUU). Besides, some respondents needed further explanations by the researcher due to confidentiality issues and lack of understanding of the concept of green management. These constraints are

Green Research
Received 18 Nov 2025
Accepted 02 December 2025

important but they do not reduce the relevance of the study but in fact emphasize the contextual issues of publishing sustainability oriented research in the oil sector of Nigeria.

The research paper makes contributions to the current discussions on the nexus between the environmental management and the organizational performance. It goes on to show that to oil companies in South-South Nigeria, green innovation and environmentally friendly practices is not only morally necessary but it is also a strategic long-term sustainability requirement. The research aims to fill in the existing gaps in theory and has practical recommendations to the stakeholders in an attempt to achieve both economic development and environmental conservation by offering empirical evidence on this relationship.

2.0 Literature Review

Green management (GM) is defined as the organizational strategies and practices that are clearly designed with the aim of reducing adverse environmental effects whilst maintaining economic viability as well as social responsibility. Researchers define GM diversely as environmental protection systems at the firm-level (GM) and life-cycle reduction of impact (GM) (Schu, Zhou, Xiao and Gao, 2014), innovation at the organizational level aimed at sustainability (GM) (Haden, Oyler and Humphreys, 2009), and the environmental aspect of CSR aimed at continuous improvement and communication between the company and its stakeholders (Skibinska and Kott, 2015). The core GM activities, which are usually mentioned, are eco-design, resource efficiency, recycling, introduction of renewable energy and adoption and management systems of environmental impact like ISO 14000, all of which are intended to help achieve the triple bottom line of People, Planet and Profit (Hage and Taruna, 2016; Dhull and Narwal, 2016). It is conceptually agreed that GM lies on a continuum between a level of low compliance and deep, proactive, strategic reconfiguring their products, processes, and corporate culture (Banerjee, 2001; Phillips, 2007).

This paper is based on the Resource-Based View (RBV) supplemented with the Institutional-Legitimacy perspective which is used as a guiding tool. According to RBV, the sources of sustained competitive advantage under this are firm-specific resources and capabilities, here, green competencies, eco-design capability and environmental management systems, can be valuable, rare, inimitable and non-substitutable (Barney, 1991; operationalized in literature on green management by Darnall, Jolley and Handfield, 2008). In addition to RBV, Institutional-Legitimacy theory provides the rationale behind the adoption of GM practices by firms following the regulatory pressures, stakeholder expectations and the pursuit of legitimacy (Bansal and Roth, 2000). Combined the two perspectives describe the internal ability pathway (RBV) which GM uses to increase performance and the external pressure pathway (Institutional) which drives adoption.

Opukri and Ibaba (2008), Oil-induced environmental degradation and internal population displacement in the Niger Delta, Nigeria, employed mixed methods research design, which involves the combination of secondary environmental assessment and community interviews of affected communities in the Niger Delta. They detected extensive oil-spill and gas-flaring impacts on livelihoods and ecosystem services, and they concluded that the corporate environmental performance was weak, which led to social dislocation. Their suggestions included tightening the environmental laws and incorporation of environmental management plans and remediation plans into the companies and community involvement.

A quantitative cross-sectional study of manufacturing firms was carried out by Kassinis and Soteriou (2008), Environmental and quality practices: Their effect on customer satisfaction and market share, whereby the authors considered firm-level

Green Research
Received 18 Nov 2025
Accepted 02 December 2025

surveys and regression analyses. They claimed that companies that adopted the holistic environmental and quality systems had increased customer satisfaction and small market share improvement. They suggested an adoption of environmental management, which was to be combined with quality management systems to enhance business advantages.

Jayant and Azhar (2014), Analysis of the barriers to implement the green supply chain management (GSCM) practices, used interpretive structural modeling (ISM) to determine and prioritize the barriers to GSCM in Indian industries. In their results, cost, inadequate technical skills and poor levels of top management commitment were the prevalent inhibitors. They suggested strategic capacity enhancement, managerial training and policy incentives to reduce the adoption barriers.

Dhull and Narwal (2016), Drivers and barriers in green supply chain management adaptation: A state-of-the-art review, has conducted a systematic literature review that summarised existing empirical studies on drivers and constraints of green practices. They made a conclusion that although adoption is driven by regulatory pressure and market demand, internal constraints provide the finance, culture and skills play important roles. They suggested that there should be coordinated policy support and investment in green technologies to address the gap in adoption.

The oil and gas industry and the Nigerian environment: A case of sustainable development by Omorogbe (2016) applied the grounded theory of a doctrinal analysis and case evidence to the study of the regulatory environment in Nigeria. The research established that environmental results were constrained by the lack of enforcement and weak institutions though there were legal frameworks and agencies. Advice suggested institutional fortification, stakeholder consultation and corporate incentive to make green investments at the firm level. Although there is a strong literature on the negative impacts of environmental degradation in the Niger Delta and the existence of hindrance and possible positive gains in green practices at the firm level, there is a dearth of empirical research on the direct relationship between a certain green management intervention (e.g., eco-design, green human resource competencies, and green investment) and the sustainability measures of the organization (e.g., financial performance, employee satisfaction, etc.) in the oil companies of Niger Delta. Specifically, there is a dearth of studies that employ firm-level primary data in the South-South region to work the RBV-based causal interferences using which green innovation and eco-friendly practices are converted to productivity and performance gains empirical gap in this study.

3.0 Methodology

The research design employed in the study was a survey research design in order to capture relevant information of a great pool of respondents that were selected among the oil producing companies in South-South Nigeria. The survey design was deemed suitable, as it enables the researcher to gather quantitative data by administering structured questionnaires, which enables one to describe, explain and analyze the relationships among the green management practices and organizational sustainability. The design was also selected due to its effectiveness in the capture of the views, experiences, and attitudes of employees on the environmentally friendly practices, green innovation, and sustainability strategies in the oil and gas industry (Coldwel and Herbst, 2004).

The researchers used the primary sources of data collected through direct observation of respondents by using a well-structured questionnaire. The survey tools were given to workers in selected oil producing companies, such as ExxonMobil Unlimited Petroleum, Gas Exploration and Chemical Services; Agip oil Company; Eterna Oil and Gas Plc; Chevron/ Texaco oil and Gas Exploration; Pan

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Green Research
Received 18 Nov 2025
Accepted 02 December 2025

Ocean oil correlation (POOC) and Belemoil Producing Limited (BPL). The selection of these firms was based on the fact that they are the major oil operators in the South-South region of Nigeria that is the centre of production of petroleum in the country. These organizations were also selected in such a way that it gave a balanced and general picture of the environmental management practices within the industry. The study population included 1,457 staff members that were attracted to the six oil producing companies selected. Since the population was very large, it was not feasible to sample out all the employees, hence we came up with a representative sample by the Taro Yamane formula. The formula is as follows: n = N/ (1+N e 2), where N is the population size, e is the margin of error (0.05), and n is the sample size. Substituting the figures, n = 1457 / (1 + 1457 /0.052) = 1457 / (1 + 3.6425) = 1457 / 4.6425 = 314. In such a way, the sample size was 314 respondents, which were found to be sufficient to guarantee the representativeness and reliability of the results. The sampling was proportionate among the firms chosen to represent the strength of the staff and have equal representation. The total valid responses retrieved and analyzed were 252 respondents, which was the final number of respondents that were to be analysed. The information received on the questionnaires issued was well coded, tabulated and analyzed with help of the right statistical software. Frequencies, percentages, were used as descriptive statistics to capture the demographic features, and broad responses of the respondents. The correlation, and regression analysis were considered as inferential statistics used to test the relationship between green management practices and organizational sustainability. The Statistical Package of the Social Sciences (SPSS) was used in the analysis thus guaranteeing precision and validity of the findings. Ethical concerns were monitored in the study process such as seeking informed consent of the participants, the confidentiality and data gathered in the study were considered as being used within the academic context.

4.0 Results and Discussions

Table 1: Examine the effect of green innovation on organizational productivity of the selected oil producing firms in South-South, Nigeria.

RESPONSES	SA 5	A 4	UN 3	D 2	SD 1	Sum	X	SD
Redesigning and improving products or services to meet new environmental criteria or directives enhance organizational performance	116	87	29	11	9	1046	4.2	.057
Use of cleaner or renewable technology to make savings (such as energy, water, waste improves organizational productivity	112	92	21	13	14	1031	4.1	.831
Redesign of production, operation processes and use of environmentally friendly material promote environmental sustainability	122	90	22	10	8	1064	4.2	.033
Reduction of hazardous materials and improving on energy efficiency and pollution output boost firms' effectiveness	128	85	22	8	9	1071	4.3	.814

Source: Field Survey, 2025

Green Research
Received 18 Nov 2025
Accepted 02 December 2025

Decision Rule

If Mean < 3.5, the effect is not high or the respondents do not agree

If Mean ⩾ 3.5, the effect is high or the respondents agree

Table 1 indicated the impact of green innovation on organizational productivity of the sampled oil producing companies in the South-South, Nigeria. Most of the respondents who gave the highest mean scores strongly agreed that the reduction of hazardous materials and an improvement in on energy efficiency and pollution output enhance the effectiveness of firm (x=4.3), redesigning of production, operation processes and use of environmentally friendly material promote environmental sustainability (x=4.2), redesigning and improving products or services to meet new environmental standards or requirements promote organizational performance (x=4.1), and use of cleaner or renewable technology to make savings (x=4.1). Thus, the fact that the means of all the responses are ⩾ 3.5 indicates that green innovation enhances organizational productivity.

Table 2: Explore the effect of eco-friendly practices on organizational performance of the selected oil producing firms in South-South, Nigeria.

Source: Field Survey, 2025

RESPONSES	SA 5	A 4	UN 3	D 2	SD 1	TOTAL	MEAN	Std. Dev.
Selection of low-impact and non-hazardous materials enhance organizational performance	126	82	22	13	9	1059	4.2	.822
Reduction of material, weight reduction and reduction in volume improve organizational efficiency	118	99	19	-	16	1059	4.2	.803
Optimization of production techniques increases organizational productivity	116	93	26	10	7	1057	4.2	.812
Using more of natural resources and energy boost organizational sustainability	122	86	24	9	11	1055	4.2	.807

The impact of eco-friendly practices on the performance of the organizations of the selected oil producing firms in South-South in Nigeria was demonstrated in Table 2. Most of the respondents who recorded the highest mean scores strongly concurred that low-impact and non-hazardous materials selection improves organizational performance (x=4.2), material reduction, weight reduction and reduced volume improve organization efficiency (x=4.2), optimization of production techniques increase organizational productivity (x=4.2), and utilization of more of natural resources and energy would improve organizational sustainability (x=4.2). Thus, all the responses have means ⩾ 3.5, which demonstrates that eco-friendly practices contribute to organizational performance.

The results of the analysis showed that green innovation positively influences the organizational productivity, to a significant extent among the sampled oil producing companies in South-South Nigeria. The findings indicated that the respondents strongly believed that the effectiveness of firms could be increased when the number of hazardous materials is reduced, energy efficiency is improved, and pollution is minimized (x = 4.3). Equally, redesigning production and operational processes with environmentally friendly materials facilitates environmental

Green Research
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sustainability (x = 4.2), whereas the redesign of a product or service to correspond to new environmental requirements leads to the overall performance (x = 4.2). Implementation of cleaner or renewable technology was also regarded as a key factor of productivity improvement (x = 4.1). The fact that all the means values were higher than the mark of 3.5 suggests that the green innovation initiatives are deeply integrated into the functioning system of these organizations and play a significant role in the attainment of the increased levels of productivity. The result is in line with the previous research work by Haden, Oyler and Humphreys (2009) and Wagner (2005) that found out that an environmentally responsible innovation produces enhanced efficiency, cost minimization, and sustainable competitive advantage.

Moreover, the findings on environmentally friendly practices exhibited a steady trend on which all measured indicators have high mean values (x = 4.2), indicating that there is high agreement among the respondents that environmentally friendly operational practices lead to positive performance in the organization. The use of low-impact and non-hazardous substances, decreasing material usage and material volume, streamlining production methods, and increased utilization of natural resources all were identified as critical towards increasing efficiency and sustainability. These results confirm the result of Ambec and Lanoie (2008) and Klassen and Whybark (1999), who suggested that the operation results and financial performance of firms engaging in environmentally conscious practices are improved. The fact that the mean scores are constant in both the tables shows that the oil-producing companies in the South-South region are becoming more conscious and adopting eco-friendly and innovative green policies that do not only contribute to environmental conservation but also create better organization effectiveness and competitiveness.

5.0 Conclusion and Recommendation

This research concluded that green management practices especially green innovation and environmentally friendly programs have a close and significant effect on the productivity and performance of the oil-producing companies in South-South Nigeria. The results obtained showed that implementation of sustainable processes of operation, use of renewable and non-hazardous materials and redesigning of production systems have high efficiency, competitiveness and sustainability in the long term among the organization. Through the inclusion of the environmental factor in the corporate strategies, the firms will not only reduce the negative impacts on the environment of their operations but also improve their economic and social results. As such, green management is an exceptional catalyst of sustainable industries and environmental management in Nigeria oil industry. Resting on the results, this study suggests that oil-producing companies in South-South Nigeria can implement holistic green management systems that would value eco-innovation and energy efficiency as well as waste minimization. The management should invest on cleaner productions technology, staff training and continuous monitoring mechanism to facilitate environmental compliance and better performance of operations. Government departments and regulatory authorities ought to tighten their policies on the environment and offer incentives, in terms of tax rebates and grants, to firms that implement green policies. In addition, companies are advised to cultivate partnerships with research companies and environmental institutions in the development of novel and context-specific sustainability solutions that would reconcile profitability and environmental conservation.

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Acknowledgments

The authors thank all benefactors that contributed to the success of this paper.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This research received no funding.

Credit role

This research is one hundred percent the contribution of the multiple authors.

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Green Research
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Accepted 02 December 2025

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