

Sustainability Attitudes, the Attitude–Behaviour Gap, and Business Competitiveness among Indigenous Oil and Gas Companies in Lagos State, Nigeria

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Abstract

Sustainability rhetoric has become pervasive in the extractive industries, yet whether a sustainability-oriented mindset by itself confers competitive advantage — or only does so when converted into concrete practice — remains an open empirical question. Anchored on sustainable development theory and entrepreneurial orientation theory, this study examined the effect of sustainability attitude on the business competitiveness of indigenous oil and gas companies in Lagos State, Nigeria, and tested whether that effect survives when the behavioural dimensions of sustainable entrepreneurship — social innovation, green practices, and resource efficiency — are simultaneously controlled. The study adopted a positivist philosophy and a quantitative, non-experimental, cross-sectional survey design. A purposive technique was used to select five indigenous operators, reported here as Operators A to E, whose combined workforce of 2,571 employees formed the sampling frame; simple random sampling with proportional allocation was then applied to select respondents within each company. From a minimum sample of 346 obtained using the Yamane (1967) formula and inflated to 494 to accommodate a 30% attrition allowance, 417 valid responses were retrieved and analysed, an effective response rate of 84.4%. Simple regression revealed a weak but significant positive effect of sustainability attitude on business competitiveness ($\beta = .141$, $t = 2.909$, $p = .004$), explaining only 2.0% of its variance. However, when social innovation, green practices, and resource efficiency were entered simultaneously, the effect of sustainability attitude turned slightly negative and non-significant ($\beta = -.025$, $t = -.529$, $p = .597$). Suppression diagnostics confirmed that sustainability attitude is the only predictor whose sign reverses between the bivariate and multivariate estimates, indicating that its apparent competitive value is largely explained by variance shared with the behavioural dimensions. The findings evidence a firm-level attitude–behaviour gap: sustainability attitude contributes to competitiveness only insofar as it is enacted through socially innovative and resource-efficient behaviour, and confers no competitive premium of its own. The study recommends that indigenous operators privilege verified sustainable conduct over declared sustainability orientation in strategy formulation, performance appraisal, and internal assurance.

Keywords: Sustainability attitude; attitude–behaviour gap; business competitiveness; suppression effect; sustainable entrepreneurship; indigenous oil and gas companies; Nigeria

1. Introduction

The oil and gas industry is central to the Nigerian economy as a primary source of revenue, employment, and foreign exchange, with proven crude oil reserves

projected at about 37 billion barrels as of 2023 (Edo et al., 2024). It is also an industry in which sustainability commitments are now ubiquitous:

corporate statements, policies, and public postures affirming environmental responsibility, social accountability, and long-term thinking have become standard features of operator communication. What such declarations are worth, commercially, is far less settled. If a sustainability-oriented mindset itself strengthens competitiveness, firms are rewarded for what they believe; if only enacted sustainability does, firms are rewarded solely for what they do — and espoused values without corresponding practice should confer no advantage at all. Resolving that question requires first specifying what a sustainability orientation is, and then distinguishing it conceptually from the conduct through which it is, or is not, expressed.

Sustainability attitude is the mindset, value system, and willingness of an individual or organisation to support actions that safeguard the environment, manage resources, and promote long-term well-being for both people and the planet (Chang et al., 2018). In the organisational context, it demonstrates how strongly a firm believes in operating responsibly — reducing waste, saving energy, delivering eco-friendly products, and supporting policies that address climate change — and it shapes choices that balance present needs with the health and stability of future generations (Jeremiah et al., 2023). Business competitiveness, in turn, denotes the exceptional strengths that allow an organisation to outperform rivals and achieve superior market performance (Malhotra et al., 2025; Ford, 2020; Bataineh et al., 2024; Zelga, 2017). Sustainable entrepreneurship, the third construct central to this study, refers to the discovery, evaluation, and exploitation of business opportunities in ways that generate economic value while simultaneously producing environmental and social value (Halдар, 2019; Taneja et al., 2023). Unlike sustainability attitude, it

is inherently behavioural: it is constituted by what firms actually do. In this study it is operationalised through three enacted dimensions — social innovation, green practices, and resource efficiency — which together represent the conduct through which a sustainability attitude is translated into action.

Three gaps motivate this study. First, the attitude-behaviour relationship is well theorised in consumer and pro-environmental psychology, but firm-level evidence on whether sustainability attitude independently predicts competitive outcomes — as distinct from the behaviours it is supposed to motivate — is scarce, particularly for extractive industries in developing economies (Borges-Tiago et al., 2024). Second, existing Nigerian studies of sustainability and competitive advantage have examined practices and reporting (Adelekan et al., 2025; Nwaobia & Akintoye, 2024) but have not isolated the attitudinal dimension. Third, studies that do include attitudinal measures rarely subject them to suppression diagnostics, so a bivariate association can be mistaken for an independent effect when it is in fact carried by correlated behaviours (Hodson & Prusaczyk, 2024). This study addresses these gaps using field data from indigenous oil and gas companies in Lagos State, Nigeria, and formal suppression analysis (Velicer, 1976, 1978; Tzelgov & Henik, 1981, 1985).

The specific objectives of the study are to: (i) examine the effect of sustainability attitude on the business competitiveness of indigenous oil and gas companies in Lagos State, Nigeria; and (ii) determine whether sustainability attitude retains an independent effect on business competitiveness when the behavioural dimensions of sustainable entrepreneurship — social innovation, green practices, and resource efficiency — are simultaneously controlled.

Accordingly, the following null hypotheses were formulated:

H01: Sustainability attitude does not have a significant effect on the business competitiveness of indigenous oil and gas companies in Lagos State, Nigeria.

H02: Sustainability attitude does not retain a significant independent effect on business competitiveness when the behavioural dimensions of sustainable entrepreneurship are controlled.

2. Literature Review

This section is organised in six parts. Sections 2.1 to 2.3 conceptualise the three constructs of the study; Section 2.4 sets out the theoretical framework and justifies the integration of the two theories adopted; Section 2.5 reviews the empirical evidence, including contrasting and null findings; and Section 2.6 synthesises the literature, states the research gap, presents the conceptual framework, and develops the hypotheses.

2.1 Business Competitiveness

Business competitiveness is the exceptional strength that allows an establishment to outshine its rivals and achieve superior performance in the market. It involves the distinctive qualities of an organisation and its offerings that a target market views as notably better and more valuable than those of competitors (Malhotra et al., 2025), enabling firms to deliver greater value, differentiate their business, strengthen market position, and drive long-term growth (Ford, 2020; Bataineh et al., 2024; Zelga, 2017). In the upstream petroleum sector, competitiveness reflects cost position, operational reliability, regulatory standing, community legitimacy, and the capacity to attract financing — attributes increasingly screened by lenders and partners against sustainability criteria (Nwaobia & Akintoye, 2024; Agu et al., 2024).

2.2 Sustainability Attitude

Sustainability attitude is the mindset, value system, and willingness to support actions that safeguard the environment, manage resources, and promote long-term well-being for people and the planet (Chang et al., 2018). It reflects the orientation of individuals or organisations that prioritise long-term ecological, social, and economic well-being over short-term economic benefit, emphasising the balance of economic outcomes with ethical, social, and ecological responsibilities so that present needs are met without compromising future generations (Jeremiah et al., 2023). Three elements are prominent in the literature. The first is environmental consciousness: awareness of the environmental impact of one's actions, expressed in efforts to minimise carbon impact, conserve natural resources, and prevent ecological degradation (Baptiste & Nordenstam, 2009; Ndubisi et al., 2020; Oyedokun & Erinoso, 2022; Horváth, 2015; Lucas, 2010; Gabriele, 2023). For indigenous oil and gas firms this includes reducing gas flaring, controlling spills, and managing waste responsibly, which builds trust with regulators and host communities (Jeremiah et al., 2023). The second is social accountability: the commitment to positively impact employees, communities, and other stakeholders through fair labour practices, community development, and ethical decision-making (Morrison et al., 2024; Taneja et al., 2023; Halder, 2019). The third is long-term strategic thinking: decision-making that weighs future impacts on company, society, and environment, encouraging innovation, risk management, and resilience planning, and embedding sustainable practice into core strategy through responsible leadership and organisational culture (Karami & Gorzynski, 2022; Gupta, 2024; Halder, 2019).

Crucially, attitude is a disposition, not a deed. The psychology of the attitude–behaviour gap holds that espoused values translate into outcomes only through enacted behaviour, and that the correlation between what actors profess and what they do is often modest (Borges-Tiago et al., 2024). At firm level, this raises the question this study tests: whether sustainability attitude predicts competitiveness in its own right, or only insofar as it is expressed through the behavioural dimensions of sustainable entrepreneurship.

2.3 Sustainable Entrepreneurship and Its Behavioural Dimensions

Sustainable entrepreneurship is the process of identifying, evaluating, and exploiting economic opportunities in a manner that simultaneously advances environmental and social value creation, so that commercial viability and sustainability outcomes are pursued as a joint rather than a competing objective (Haldar, 2019; Taneja et al., 2023). Whereas sustainability attitude is dispositional, sustainable entrepreneurship is behavioural and observable in firm conduct. Consistent with the wider literature and with the measurement approach adopted in this study, three enacted dimensions are distinguished.

Social innovation refers to novel arrangements, programmes, and partnerships through which a firm addresses social needs in its operating environment — host-community development schemes, local content and skills-transfer initiatives, and shared-value arrangements with community stakeholders — and through which it earns the community legitimacy on which upstream operations depend (Taneja et al., 2023; Morrison et al., 2024). Green practices refer to the operational routines through which environmental impact is reduced: flare reduction, spill containment, effluent and waste management, emissions

monitoring, and compliance with environmental regulation (Ndubisi et al., 2020; Bataineh et al., 2024). Resource efficiency refers to the conversion of inputs — energy, water, materials, and capital equipment — into output with minimum waste, and is the dimension most directly connected to unit cost and therefore to cost-based competitive position (Lucas, 2010; Agu et al., 2024). Together these three dimensions constitute the behavioural channel through which a sustainability attitude may reach competitive outcomes, and it is their simultaneous inclusion that permits the test conducted in this study.

2.4 Theoretical Framework

This study is anchored on sustainable development theory, complemented by entrepreneurial orientation theory. Sustainable development theory, propounded in 1987 by the Brundtland Commission, holds that organisations should meet present needs without undermining the ability of future generations to meet theirs, treating economic, social, and environmental objectives as interdependent rather than competing priorities (Shi et al., 2019; Dasgupta, 2007; Sunny et al., 2024). It requires systemic thinking in which decisions are evaluated for long-term ecological and social consequences (Ukaga & Maser, 2023). Within this framework, sustainability attitude represents the internalisation of sustainable development values — the cognitive and normative precondition for sustainable conduct.

Entrepreneurial orientation theory, proposed by Lumpkin and Dess in 1996, sharpens the distinction the study exploits. The theory locates competitive advantage in behavioural posture — innovativeness, risk-taking, and proactiveness — rather than in belief alone (Lumpkin & Dess, 1996; Wales et al., 2023; Kreiser & Davis, 2010; Wales, 2016). By this logic, a sustainability mindset should earn

competitive returns only when converted into entrepreneurial action: socially innovative programmes, green operating practices, and resource-efficient processes. The two theories are integrated deliberately, and the integration is necessary rather than merely additive, because neither theory alone can generate the study's central prediction. Sustainable development theory explains why firms would hold a sustainability orientation at all and what its normative content is, but it is silent on the mechanism by which such an orientation might be converted into competitive returns; entrepreneurial orientation theory specifies that conversion mechanism — value is created through enacted behavioural posture — but does not itself specify the sustainability content of that behaviour. Combined, they yield a single testable proposition that neither supplies independently: a positive bivariate association between sustainability attitude and competitiveness is expected, because attitude reflects internalised sustainable development values that co-occur with sustainable conduct; but the causal work is ascribed to enacted behaviour, so the attitudinal effect should not survive the introduction of the behavioural dimensions. This joint prediction motivates the study's two-stage empirical design.

2.5 Empirical Review

Evidence on sustainability orientation and firm outcomes is broadly positive but rarely isolates attitude from practice. Chang et al. (2018) reported that sustainability attitude is positively associated with performance, with larger firms generally achieving stronger sustainability outcomes than smaller ones. In the Nigerian context, Adelekan et al. (2025) found that sustainable business practices have a positive and significant effect on the competitive advantage of fast-moving consumer goods operators in Lagos State, and Nwaobia and Akintoye

(2024) showed that sustainability performance reporting supports competitive advantage among listed manufacturing firms — both, however, measuring practice or disclosure rather than disposition. Enwere et al. (2024) established a positive relationship between strategic entrepreneurship and the operational performance of indigenous oilfield services firms in Nigeria's South-South region, and Agu et al. (2024) argued that integrating sustainability into core business strategy boosts consumer trust and differentiation.

The evidence is not, however, uniformly positive, and the qualifications matter for the present study. In a systematic review of 164 studies published between 2023 and 2025, Zahra et al. (2025) concluded that sustainable business practices generally enhance firm performance but that their effects are contingent on strategic alignment, industry context, ownership structure, and institutional environment; they further reported that social initiatives are the most consistent performance drivers, whereas environmental practices deliver cost savings and risk reduction but may carry transitional profitability costs rather than a differentiation premium. Borges-Tiago et al. (2024), examining the attitude–behaviour gap at both macro and micro levels, found that professed sustainable attitudes frequently fail to translate into corresponding behaviour, and that the size of the gap is itself contingent on economic and psychological conditions. Taken together, these findings caution against treating a positive attitude–performance association as evidence of an independent attitudinal effect, and provide the justification for formulating and testing H01 in the null form rather than assuming a positive relationship.

Whether any observed effect is independent is a separate question, best addressed through suppression analysis. Velicer (1976, 1978) proposed a definition

of suppression based on the comparison of zero-order correlations with regression weights, while Tzelgov and Henik (1981, 1985) argued that Velicer's assumption captures only a subset of suppression situations and developed a regression-weights method aligned with Conger's broader model. Hodson and Prusaczyk (2024) more recently documented that sign reversal between zero-order and multivariate estimates — negative suppression — is frequently misinterpreted in published research, and set out practical guidelines for its identification and reporting. Applied here, if the attitude–competitiveness association is carried by variance that attitude shares with the behavioural dimensions, its regression weight should collapse toward zero, or reverse sign, once those dimensions are controlled. No prior study, to the researchers' knowledge, has subjected the sustainability attitude–competitiveness relationship to this test in the Nigerian upstream sector.

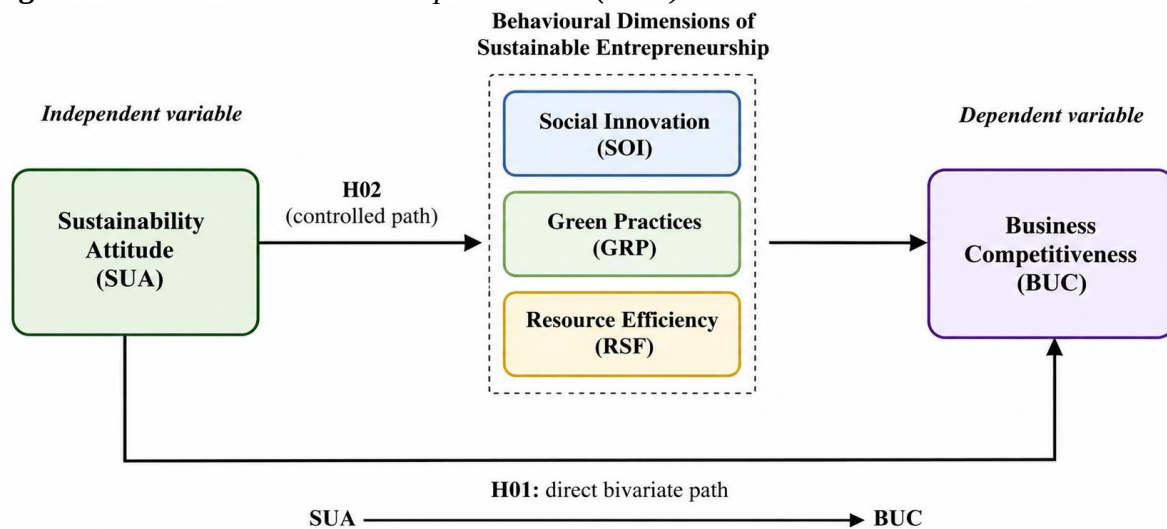
2.6 Synthesis, Research Gap, Conceptual Framework, and Hypotheses Development

Three conclusions follow from the foregoing review. First, the literature consistently associates sustainability with improved firm outcomes, but it measures sustainability in inconsistent ways: some studies measure enacted practice (Adelekan et al., 2025; Enwere et al., 2024), some measure disclosure (Nwaobia & Akintoye, 2024), and only a few measure disposition (Chang et al., 2018). Because these are treated as interchangeable indicators of a single underlying orientation, the literature cannot presently say whether the reported

competitive returns attach to belief or to conduct. Second, where contrasting and contingent evidence exists (Zahra et al., 2025; Borges-Tiago et al., 2024), it points specifically to the fragility of attitudinal effects and to the possibility that environmental practice yields cost and risk benefits rather than differentiation — neither of which has been tested in the Nigerian upstream context. Third, the statistical tool capable of separating these possibilities, suppression analysis, is well established methodologically (Velicer, 1976, 1978; Tzelgov & Henik, 1981, 1985; Hodson & Prusaczyk, 2024) but is almost never applied in sustainability–performance research in developing economies.

The research gap is therefore both substantive and methodological: no study has yet established whether sustainability attitude exerts an independent effect on the business competitiveness of indigenous oil and gas companies in Nigeria once the behavioural dimensions of sustainable entrepreneurship are simultaneously controlled, nor applied formal suppression diagnostics to that question. The conceptual framework in Figure 1 represents the relationships tested. Sustainability attitude is modelled as the independent variable and business competitiveness as the dependent variable; the three behavioural dimensions of sustainable entrepreneurship — social innovation, green practices, and resource efficiency — are modelled as the enacted channel through which attitude is expressed, and are entered as simultaneous predictors in the second stage of the analysis.

Figure 1. 4Source: Authors' conceptualisation (2026).



On the basis of the synthesis above, the following null hypotheses are formally stated for testing:

H01: Sustainability attitude does not have a significant effect on the business competitiveness of indigenous oil and gas companies in Lagos State, Nigeria.

H02: Sustainability attitude does not retain a significant independent effect on the business competitiveness of indigenous oil and gas companies in Lagos State, Nigeria when social innovation, green practices, and resource efficiency are simultaneously controlled.

3. Methodology

3.1 Research Philosophy and Design

The study is rooted in the positivist research philosophy, which presumes that reality is objective and measurable through empirical investigation. Consistent with that position, a quantitative, non-experimental, cross-sectional survey design was adopted. The design enabled one-time administration of a structured questionnaire and statistical testing of the hypothesised relationships, while minimising researcher bias and enhancing replicability.

3.2 Population, Sampling Frame, and Sample Size Determination

The population of the study comprises approximately 17,631 employees of 29

indigenous oil and gas companies operating in Lagos State. Five operators were selected from this population, and their combined workforce of 2,571 employees constituted the sampling frame. In accordance with the confidentiality undertaking given to the participating firms, the five operators are reported throughout this paper as Operators A, B, C, D, and E.

The minimum sample size was determined using the Yamane (1967) formula, $n = N / (1 + Ne^2)$, where N is the sampling frame and e is the margin of error. At a 5% margin of error: $n = 2,571 / (1 + 2,571 \times 0.05^2) = 2,571 / (1 + 6.4275) = 2,571 / 7.4275 = 346.1$, rounded to 346 respondents. To preserve this minimum in the event of non-response and unusable returns, the figure was inflated by a 30% attrition allowance (Quinlan et al., 2015): $346 / (1 - 0.30) = 346 / 0.70 = 494.3$, rounded to 494. Accordingly, 494 copies of the questionnaire were administered. A total of 417 valid responses were retrieved and analysed, yielding an effective response rate of $417 / 494 = 84.41\%$, reported as 84.4%. The realised sample of 417 exceeds the computed minimum of 346 by 71 responses, so the study retains its intended precision notwithstanding attrition.

3.3 Sampling Technique

A two-stage sampling procedure was adopted. At the first stage, a purposive technique was used to select the five operators, on the basis of scale of operations, asset base, production volumes, more than fifteen years of operational history, and dominant Nigerian equity ownership. At the second stage, simple random sampling with proportional allocation was applied to select respondents within each company, so that each operator contributed to the sample in proportion to its share of the 2,571-employee frame. Copies of the questionnaire were administered through Google Forms and by physical contact across the five companies.

3.4 Instrumentation, Validity, and Reliability

The research instrument was a structured questionnaire measured on a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Items measuring sustainability attitude were adapted from Simsek (2025) and Gericke et al. (2019), while items measuring business competitiveness were adapted from Schaefer et al. (2021) and Klapalová (2011). Content and construct validity were established through expert review by academics and oil and gas practitioners.

$$BUC_i = \beta_0 + \beta_1SUA_i + \varepsilon_i \quad (\text{Model 1, for H01})$$

$$BUC_i = \beta_0 + \beta_1SUA_i + \beta_2SOI_i + \beta_3GRP_i + \beta_4RSF_i + \varepsilon_i \quad (\text{Model 2, for H02})$$

where BUC is business competitiveness, SUA is sustainability attitude, and SOI (social innovation), GRP (green practices), and RSF (resource efficiency) are the behavioural dimensions of sustainable entrepreneurship. Following Velicer (1976, 1978), suppression is indicated where a predictor's regression weight in Model 2 reverses sign relative to its zero-order correlation with the criterion; consistent with Tzelgov and Henik (1981, 1985) and Hodson and Prusaczyk (2024), attenuation of a regression weight that nonetheless retains its original sign is

A pilot study was conducted with 50 employees of indigenous oil and gas companies operating in Rivers State. These firms lie outside the Lagos State population and sampling frame from which the main study was drawn, and no pilot respondent formed part of the 2,571-employee frame or of the 417 analysed responses; the pilot sample is therefore independent of the main sample, and contamination of the main results is precluded. Rivers State firms were selected for the pilot precisely because they are comparable in sector, scale, and operating environment to the study firms without belonging to the study frame. The pilot returned Cronbach's alpha coefficients of .801 for sustainability attitude and .722 for business competitiveness, both exceeding the .70 acceptability threshold (Burns & Burns, 2008; DeVellis, 1991).

3.5 Model Specification and Method of Analysis

Hypotheses were tested using simple and multiple regression analysis at the 5% significance level, supplemented by suppression diagnostics comparing zero-order correlations with multivariate regression weights (Velicer, 1976; Tzelgov & Henik, 1985; Hodson & Prusaczyk, 2024). The models are specified as:

treated as ordinary shared-variance redundancy and not as suppression. Collinearity was assessed using tolerance and variance inflation factor (VIF) statistics.

4. Results

4.1 Descriptive Statistics and Correlations

Table 1 presents the descriptive statistics and Pearson correlations. Mean scores of 3.17 (SD = .516) for sustainability attitude and 3.29 (SD = .634) for business competitiveness indicate moderate levels

of both constructs, and skewness (.451 to .521) and kurtosis (.318 to .374) values raised no normality concerns. Sustainability attitude correlated positively and significantly, though weakly, with business competitiveness ($r = .141$, $p < .01$), and more strongly with the behavioural dimensions — social

innovation ($r = .170$), green practices ($r = .317$), and resource efficiency ($r = .357$) — a correlation pattern consistent with attitude operating through behaviour. Collinearity diagnostics in the joint model (tolerance = .835; VIF = 1.197) indicated no multicollinearity concerns.

Table 1. Descriptive statistics and correlations ($N = 417$)

Variable	M	SD	Skew.	Kurt.	1	2	3	4
1. Business competitiveness	3.29	.634	.451	.374	—			
2. Social innovation	3.12	.525	.523	.306	.267**	—		
3. Green practices	3.11	.453	.490	.342	.231**	.532*	—	
4. Resource efficiency	3.21	.476	.513	.339	.436**	.342**	.405**	—
5. Sustainability attitude	3.17	.516	.521	.318	.141**	.170**	.317**	.357**

Note. * $p < .05$; ** $p < .01$. Source: Authors' field computation (2026).

4.2 Test of Hypothesis One

Table 2 reports the simple regression of business competitiveness on sustainability attitude. The model returned $R = .141$ and $R^2 = .020$, indicating that sustainability attitude explains only 2.0% of the variance in business competitiveness. The F-statistic of 8.464 ($p < .05$) confirmed model

fit, and the coefficient ($\beta = .141$, $t = 2.909$, $p = .004$) indicated a positive but weak significant effect. The null hypothesis was therefore rejected: sustainability attitude has a weak but significant effect on the business competitiveness of indigenous oil and gas companies in Lagos State, Nigeria. The Durbin–Watson statistic of 1.908 indicated no significant autocorrelation.

Table 2. Simple regression of business competitiveness on sustainability attitude ($N = 417$)

Predictor	B	Std. Error	β	t	p
(Constant)	2.742	.192		14.282	.000
Sustainability attitude	.174	.060	.141	2.909	.004

$R = .141$; $R^2 = .020$; Adj. $R^2 = .018$; $F = 8.464$ ($p < .05$); Durbin–Watson = 1.908

Note. Dependent variable: business competitiveness. Source: Authors' fieldwork (2026).

4.3 Test of Hypothesis Two: Joint Model and Suppression Diagnostics

Table 3 presents the multiple regression in which sustainability attitude competes with the behavioural dimensions of sustainable entrepreneurship. The joint model was significant ($R = .454$, $R^2 = .206$, Adjusted $R^2 = .198$, $F = 26.751$, $p < .05$; Durbin–Watson = 1.873), but the effect of sustainability attitude turned slightly negative and non-significant ($\beta = -.025$, $t = -.529$, $p = .597$), while resource

efficiency ($\beta = .396$, $t = 7.848$, $p < .05$) and social innovation ($\beta = .130$, $t = 2.480$, $p = .014$) retained significant contributions. Green practices did not contribute significantly to the model ($\beta = .010$, $t = .175$, $p = .862$). The null hypothesis of no independent effect could not be rejected: sustainability attitude does not retain a significant independent effect on business competitiveness once the behavioural dimensions are controlled.

Table 3. Multiple regression for the joint model of sustainable entrepreneurship dimensions on business competitiveness ($N = 417$)

Predictor	B	Std. Error	β	t	p
(Constant)	1.163	.251		4.629	.000
Sustainability attitude	-.031	.059	-.025	-.529	.597
Social innovation	.157	.063	.130	2.480	.014
Green practices	.013	.077	.010	.175	.862
Resource efficiency	.528	.067	.396	7.848	.000
$R = .454$; $R^2 = .206$; Adj. $R^2 = .198$; $F = 26.751$ ($p < .05$); Durbin-Watson = 1.873					

Note. Dependent variable: business competitiveness. Tolerance/VIF for sustainability attitude: .835/1.197. Source: Authors' fieldwork (2026).

Table 4 reports the suppression diagnostics, comparing each predictor's zero-order correlation with business competitiveness against its standardised weight in the joint model. Sustainability attitude is the only variable whose sign reverses between the bivariate estimate ($r = .141$, positive) and the multivariate estimate ($\beta = -.025$, negative), which is the classical indication of suppression (Velicer, 1976, 1978). The remaining three predictors are attenuated in magnitude but retain their original positive sign: social innovation falls from .267 to .130, green practices from .231 to .010, and resource efficiency from .436 to .396. Attenuation without sign reversal reflects ordinary

shared variance among correlated predictors rather than suppression, and these three variables are accordingly classified as not exhibiting suppression (Hodson & Prusaczyk, 2024). Following Tzelgov and Henik (1981, 1985), whose regression-weights method captures suppression situations beyond Velicer's definition, the pattern indicates that the bivariate relationship between sustainability attitude and business competitiveness is largely explained by variance shared with the other sustainable entrepreneurship factors, with collinearity diagnostics (tolerance = .835; VIF = 1.197) ruling out multicollinearity as an alternative explanation.

Table 4. Suppression diagnostics: zero-order correlations versus multivariate regression weights

Variable	Zero-order r with BUC	β in multiple regression	Sign reversal?	Suppression indicated?
Social innovation	.267 (positive)	.130 (attenuated, positive)	No	No
Green practices	.231 (positive)	.010 (near zero, positive)	No	No
Resource efficiency	.436 (positive)	.396 (largely retained, positive)	No	No
Sustainability attitude	.141 (positive)	-.025 (negative)	Yes	Yes

Note. BUC = business competitiveness. Suppression is indicated only where the standardised regression weight reverses

sign relative to the zero-order correlation (Velicer, 1976, 1978; Hodson & Prusaczyk, 2024). Attenuation of

magnitude without a change of sign reflects shared variance among correlated predictors and is not classified as suppression. Source: Authors' field survey (2026).

Discussion of Findings

The bivariate finding that sustainability attitude has a weak but significant effect on business competitiveness indicates that improvement in sustainability orientation contributes, in a limited way, to the competitive performance of indigenous oil and gas companies. This is in tandem with Chang et al. (2018), who reported a significant positive association between sustainability attitude and performance among Chinese construction enterprises. It also aligns directionally with the Nigerian evidence, though the comparison is instructive precisely because the constructs differ. Adelekan et al. (2025) found a positive and significant effect on competitive advantage among Lagos State fast-moving consumer goods operators, and Nwaobia and Akintoye (2024) reported a comparable effect among listed manufacturing firms; both, however, measured enacted practice and sustainability reporting rather than disposition, and both obtained substantially stronger effects than the $R^2 = .020$ recorded here for attitude alone. Read together, these results suggest that the robust competitive returns documented in the Nigerian literature attach to what firms do and disclose, not to what they hold as orientation — a reading the multivariate analysis then confirms directly.

The multivariate and suppression findings sharpen this into the study's central contribution. Once the behavioural dimensions of sustainable entrepreneurship were controlled, the attitudinal effect vanished and reversed in sign — the classical signature of negative suppression — indicating that whatever competitive value sustainability attitude appears to carry at the bivariate level is in

fact transmitted through the socially innovative and resource-efficient behaviours with which it correlates ($r = .170$ to $.357$; see Table 1). In plain terms, the market does not pay for what indigenous operators believe about sustainability; it pays for what they do about it. This is firm-level evidence of an attitude-behaviour gap in the Nigerian upstream sector, consistent with entrepreneurial orientation theory's location of competitive advantage in behavioural posture rather than disposition (Wales et al., 2023; Lumpkin & Dess, 1996), with recent cross-level evidence that professed sustainable attitudes routinely fail to translate into corresponding conduct (Borges-Tiago et al., 2024), and with sustainable development theory when its three pillars are read as requiring enactment rather than endorsement (Shi et al., 2019; Sunny et al., 2024).

The null result for green practices warrants separate comment, since it is the one behavioural dimension that did not survive the joint model ($\beta = .010$, $t = .175$, $p = .862$) despite a significant zero-order correlation with competitiveness ($r = .231$, $p < .01$). Two explanations are consistent with the data. First, green practices are strongly correlated with the other behavioural dimensions, particularly social innovation ($r = .532$) and resource efficiency ($r = .405$), so their apparent bivariate contribution is largely absorbed once those variables are entered; the attenuation is redundancy rather than suppression, since the sign is retained. Second, and substantively, green practice in the Nigerian upstream sector is heavily compliance-driven: flare reduction, spill containment, and waste management are regulated obligations applying uniformly to licensed operators, so a firm that performs them adequately achieves parity rather than advantage. Resource efficiency, by contrast, feeds directly into unit cost and

is therefore capable of differentiating operators, and social innovation shapes the community legitimacy on which uninterrupted upstream operations depend. This interpretation is consistent with Zahra et al. (2025), who found across 164 recent studies that environmental practices tend to deliver cost savings and risk reduction rather than a differentiation premium, while social initiatives are the most consistent performance drivers. Green practices should therefore be read as a necessary licence-to-operate condition in this sector rather than as a source of competitive advantage in their own right. The findings also carry a cautionary methodological implication for sustainability research in developing economies. Studies that regress performance on attitudinal measures alone — without controlling for enacted practices — risk reporting spurious attitudinal effects that suppression analysis would eliminate. The divergence between this study's bivariate and multivariate estimates illustrates precisely how such overstatement arises, and argues for routine suppression diagnostics (Velicer, 1976; Tzelgov & Henik, 1985; Hodson & Prusaczyk, 2024) in models that mix dispositional and behavioural predictors. It equally argues for care in the opposite direction: as Table 4 shows, attenuation of a coefficient is not itself evidence of suppression, and treating it as such would misdescribe three of the four predictors examined here.

5. Conclusion and Recommendations

This study examined the effect of sustainability attitude on the business competitiveness of indigenous oil and gas companies in Lagos State, Nigeria, and tested whether that effect is independent of the behavioural dimensions of sustainable entrepreneurship. It concludes that sustainability attitude has only a weak bivariate effect on competitiveness and no

independent effect once behaviour is controlled: its contribution is real but wholly carried by enactment. A sustainability mindset is a necessary starting point, not a competitive asset in itself — evidence of an attitude–behaviour gap in Nigeria's indigenous upstream sector.

Based on the findings, the study makes three recommendations, each of which follows directly from the variables tested and the sample studied.

First, indigenous oil and gas companies should convert sustainability orientation into verifiable conduct by channelling stated commitments into resource-efficiency programmes and social innovation initiatives with defined targets, budgets, and named accountability, since these are the behavioural channels that carried the competitive return in the joint model. Green practices should continue to be resourced as a regulatory and licence-to-operate obligation, but should not be relied upon as a source of differentiation on the evidence of this study.

Second, boards and executives should audit for attitude–behaviour gaps by comparing espoused sustainability positions in corporate communications against operational indicators such as flaring intensity, energy and water use, waste performance, and community outcomes, treating divergence as a strategic risk. The suppression pattern reported here is precisely the statistical footprint such a gap leaves in firm-level data.

Third, sustainability training and culture programmes should be redesigned around behavioural enactment — embedding sustainability criteria in operating procedures, procurement, and project appraisal — rather than around awareness and affirmation alone, given that attitudinal orientation alone did not translate into competitive outcomes in this sample.

A fourth implication concerns external parties and is offered tentatively, since it extends beyond the variables tested in this study. If, as the findings suggest, competitive returns accrue to enacted conduct rather than declared orientation, then regulators, lenders, and partners may have reason to weight verified sustainable conduct more heavily than stated sustainability commitments in compliance frameworks, environmental, social, and governance screening, and contract prequalification. This study did not measure regulatory, lending, or prequalification outcomes, and the proposition is therefore advanced as a direction for policy research rather than as a finding of this study.

5.1 Limitations and Suggestions for Further Studies

The study is limited to five indigenous operators headquartered in Lagos State and to a cross-sectional design, which restricts causal inference; the suppression pattern identified is correlational, and its mediational interpretation requires

longitudinal confirmation. Perceptual survey measures of attitude may also be inflated by social desirability, which would if anything strengthen rather than weaken the attitude–behaviour gap reported. The policy implication offered in Section 6 was not directly tested, since regulatory, financing, and prequalification outcomes were outside the scope of the instrument. Future studies should formally test the behavioural dimensions as mediators of the attitude–competitiveness relationship using longitudinal or panel designs, triangulate self-reported attitude with observed conduct and objective operational indicators, examine boundary conditions such as firm size and regulatory exposure under which attitude converts into behaviour more readily (Chang et al., 2018; Zahra et al., 2025), test whether green practices function as a parity condition rather than a differentiator using objective environmental performance data, and replicate the suppression analysis in other producing states and extractive sectors.

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