SUSTAINABLE ENTREPRENEURIAL INTENTION AND CLIMATE AWARENESS: TESTING THE THEORY OF PLANNED BEHAVIOUR

Victor Chidera Oguh
Department of Entrepreneurship,
Veritas University Abuja, Nigeria
Oguhvictor20@gmail.com

Okuji Obinna Oreh, PhD
Department of Finance,
National Open University of Nigeria
drooreh@gmail.com

Mogu, Simon Ijing
Department of Accounting,
Veritas University Abuja, Nigeria

Abstract

This study investigates the role of environmental awareness in shaping sustainable entrepreneurial intention, drawing on the Theory of Planned Behaviour (TPB) and its sustainability-oriented extensions. In the face of escalating climate challenges, understanding how cognitive and attitudinal factors influence the emergence of sustainability-driven entrepreneurship has become increasingly important. The study conceptualizes environmental awareness as a key antecedent of entrepreneurial intention, mediated by sustainability orientation, which reflects the degree to which individuals prioritize ecological and social considerations in venture creation. A quantitative research design is adopted, using cross-sectional survey data collected from prospective and early-stage entrepreneurs. Environmental awareness is operationalized through measures of climate change knowledge and concern, while sustainability orientation captures pro-environmental values and ethical business inclinations. Entrepreneurial intention is assessed using validated TPB-based scales. Regression analysis with the aid of SPSS is employed to test the hypothesized relationships and to evaluate the mediating role of sustainability orientation within the TPB framework. The findings reveal that environmental awareness exerts a positive and significant influence on entrepreneurial intention, both directly and indirectly through sustainability orientation. The results support the extension of TPB by demonstrating that sustainability-related cognitions enhance the predictive power of the model in explaining entrepreneurial behaviour. Individuals with higher levels of climate awareness are more likely to develop intentions to engage in environmentally responsible business ventures. The study contributes to the literature by integrating sustainability constructs into TPB-based entrepreneurship models. Policy implications highlight the importance of environmental education and awareness programmes in fostering a new generation of sustainability-oriented entrepreneurs capable of addressing climate-related challenges.

Keywords: Sustainable entrepreneurship; Entrepreneurial intention; Sustainability orientation and Climate awareness.

Introduction

The global intensification of climate change, environmental degradation, and biodiversity loss has generated mounting pressure on economic actors at every scale to reconsider their relationship with the natural environment. Entrepreneurship, long celebrated as a primary engine of innovation and economic growth, is increasingly called upon to serve simultaneously as a vehicle for ecological transformation. Sustainable entrepreneurship, defined as the creation of ventures that pursue economic value generation while proactively addressing environmental and social challenges, has

emerged as a theoretically productive and practically significant domain within the broader entrepreneurship literature (Dean & McMullen, 2007; Shepherd & Patzelt, 2011). However, the psychological and cognitive antecedents that propel individuals toward sustainability-oriented venture creation remain incompletely understood, particularly in emerging economy contexts where institutional environments, educational systems, and cultural attitudes toward the environment differ substantially from those prevalent in the Global North.

The Theory of Planned Behaviour (TPB), developed by Ajzen (1991) from the earlier Theory of Reasoned Action (Fishbein & Ajzen, 1975), provides the dominant cognitive framework for understanding the formation of behavioural intentions across a wide range of domains, including entrepreneurship (Liñán & Chen, 2009; Krueger et al., 2000). The TPB posits that behavioural intention is the proximate determinant of behaviour, and that it is predicted by three constructs: attitude toward the behaviour, subjective norms, and perceived behavioural control. Its application to entrepreneurial intention has generated a substantial empirical literature demonstrating the theory's predictive utility across cultural and institutional contexts (Liñán et al., 2011; Fayolle & Liñán, 2014). However, the standard TPB model was not developed with sustainability-oriented behaviours in mind, and its extension to capture the motivational specificity of sustainable entrepreneurship requires the integration of additional cognitive constructs that reflect environmental and ethical dimensions of business creation.

Environmental awareness, encompassing knowledge of climate change processes, concern about ecological degradation, and recognition of the interconnections between human economic activity and natural systems, has been theorised and partially demonstrated as a significant antecedent of pro-environmental behaviour (Kollmuss & Agyeman, 2002; Steg & Vlek, 2009). In the entrepreneurial context, individuals who possess greater environmental knowledge and concern may be more motivated to identify sustainability-related opportunity spaces, to evaluate potential ventures through an ecological lens, and to develop intentions to create businesses that address rather than exacerbate environmental problems (Hockerts & Wüstenhagen, 2010; Kuckertz & Wagner, 2010). The mediating role of sustainability orientation, a dispositional tendency to prioritise ecological and social values in decision-making—between environmental awareness and entrepreneurial intention represents a theoretically important but empirically underdeveloped pathway.

This study addresses these gaps by investigating three interrelated questions: (i) Does environmental awareness, operationalized through climate change knowledge and concern, significantly predict sustainable entrepreneurial intention? (ii) Is sustainability orientation a significant mediator of the relationship between environmental awareness and entrepreneurial intention? (iii) Does the integration of sustainability constructs enhance the predictive power of the standard TPB model in the entrepreneurial context? These questions are addressed using cross-sectional survey data collected from prospective and early-stage entrepreneurs, with regression analysis employed to test direct, indirect, and mediated relationships.

The study makes three principal contributions to the literature. First, it advances the empirical application of the TPB to sustainable entrepreneurship by explicitly modelling environmental awareness as a cognitive antecedent that operates through both direct attitudinal pathways and the indirect pathway of sustainability orientation. Second, it provides evidence from a Nigerian context, addressing the relative neglect of Sub-Saharan African perspectives in the sustainable entrepreneurship literature, where environmental challenges are acute and entrepreneurial

ecosystems are rapidly evolving. Third, it generates policy-relevant evidence on the role of environmental education in shaping the entrepreneurial intentions of prospective founders, contributing to debates about how formal and informal educational interventions can cultivate a generation of sustainability-oriented entrepreneurs. The remainder of the paper proceeds as follows: Section 2 reviews the theoretical and empirical literature and develops the research hypotheses; Section 3 describes the research design and methodology; Section 4 presents the empirical findings; Section 5 discusses the implications; and Section 6 concludes.

Literature Review and Hypothesis Development

The Theory of Planned Behaviour and Entrepreneurial Intention

The TPB (Ajzen, 1991) has provided the foundational theoretical architecture for entrepreneurial intention research since Krueger and Carsrud (1993) first applied it to the entrepreneurial domain. The model identifies three antecedents of behavioural intention: attitude toward the behaviour (the degree to which the individual holds a positive or negative personal evaluation of performing the behaviour), subjective norms (perceived social pressure from significant others to perform or not perform the behaviour), and perceived behavioural control (the individual's perception of the ease or difficulty of performing the behaviour, encompassing self-efficacy and controllability dimensions). In the entrepreneurial context, attitude toward entrepreneurship, social norms favouring new venture creation, and entrepreneurial self-efficacy are the corresponding constructs.

A large body of empirical research has validated the TPB's predictive utility for entrepreneurial intention across diverse cultural settings. Liñán and Chen (2009) developed the widely adopted Entrepreneurial Intention Questionnaire (EIQ) based on TPB constructs and demonstrated its cross-cultural validity across samples from Spain and Taiwan. Krueger et al. (2000) compared the TPB with Shapero's entrepreneurial event model across United States student samples and found both models capable of explaining substantial variance in entrepreneurial intentions. Meta-analyses by Schlaegel and Koenig (2014) and Choongo et al. (2017) confirmed the robustness of TPB-based entrepreneurial intention models, while also identifying moderating effects of national culture, education, and prior entrepreneurial exposure. Despite this accumulation of evidence, the standard TPB model's application to sustainability-motivated entrepreneurship has been recognised as theoretically incomplete, motivating calls for sustainability-specific extensions (Lüthje & Franke, 2003; Fayolle & Liñán, 2014).

Sustainable Entrepreneurship: Conceptual Foundations

Sustainable entrepreneurship sits at the intersection of entrepreneurship theory and sustainability science. Dean and McMullen (2007) defined it as the process of discovering, evaluating, and exploiting economic opportunities that contribute to sustainability by reducing destructive or creating protective effects on the natural and communal environments. Shepherd and Patzelt (2011) extended this definition to encompass the preservation of nature, life support, and community in the pursuit of opportunities, positioning sustainable entrepreneurship as simultaneously economically, ecologically, and socially productive. Hockerts and Wüstenhagen (2010) distinguished between "greening Goliaths" (incumbent firms incrementally improving environmental performance) and "emerging Davids" (new entrants pursuing radical sustainability innovation), locating sustainable entrepreneurship primarily in the latter category and underscoring its disruptive potential within industries locked into carbon-intensive trajectories.

The emergence of sustainable entrepreneurial intention as a distinct construct acknowledges that the cognitive and motivational pathways leading individuals to create sustainability-oriented ventures may differ systematically from those underpinning conventional entrepreneurial intention (Kuckertz & Wagner, 2010). Whereas conventional entrepreneurial intention is primarily driven by

economic opportunity recognition and financial motivation, sustainable entrepreneurial intention is additionally shaped by pro-environmental values, ecological concern, and a sense of moral responsibility for addressing environmental problems through business creation (Liñán et al., 2011; Muñoz & Cohen, 2018). This motivational complexity necessitates theoretical models that capture both the standard TPB constructs and the sustainability-specific cognitions that differentiate ecological from economic entrepreneurial motivation.

Environmental Awareness as an Antecedent of Sustainable Entrepreneurial Intention

Environmental awareness is a multi-dimensional construct encompassing knowledge of environmental problems, particularly climate change; concern about their consequences for human and natural systems; and a sense of personal or collective responsibility to address them (Dunlap & Van Liere, 1978; Franzen & Vogl, 2013). In the pro-environmental behaviour literature, awareness has been theorised as a necessary though not sufficient condition for behavioural change, operating through attitudinal and normative mechanisms that align with the TPB framework (Kollmuss & Agyeman, 2002; Steg & Vlek, 2009). The norm-activation model (Schwartz, 1977) further specifies that awareness of adverse environmental consequences activates personal norms of moral obligation that motivate altruistically motivated environmental behaviour.

In the entrepreneurial intention literature, the link between environmental awareness and sustainability-oriented venture creation has received growing but still limited empirical attention. Kuckertz and Wagner (2010) found that sustainability orientation, partly driven by environmental values, positively moderates the relationship between business opportunity recognition and sustainable entrepreneurial intention in a German student sample. Muñoz and Cohen (2018) conducted a systematic review of 109 sustainable entrepreneurship articles and identified environmental awareness and concern as recurring antecedents, though operationalization was inconsistent across studies. More recently, Dhahri and Omri (2018) demonstrated across a panel of developing economies that environmental knowledge significantly predicts environmental behaviour, a finding with direct implications for the relationship between climate awareness and sustainability-driven entrepreneurship.

Drawing on these theoretical foundations, the first hypothesis is proposed:

H_1 : Environmental awareness exerts a positive and significant direct effect on sustainable entrepreneurial intention.

Sustainability Orientation as a Mediator

Sustainability orientation refers to the dispositional tendency of individuals to incorporate environmental and social considerations into their values, decision-making frameworks, and goal hierarchies (Kuckertz & Wagner, 2010; Parrish, 2010). It is conceptually related to, but distinct from, environmental awareness: whereas awareness reflects cognitive knowledge and affective concern about environmental problems, sustainability orientation reflects a more stable value system in which ecological and social priorities are internalised as integral to one's identity and purpose. Individuals with high sustainability orientation are more likely to evaluate entrepreneurial opportunities through an ecological lens, to perceive environmental responsibility as central to business success, and to commit to sustainability-related entrepreneurial goals (Shepherd & Patzelt, 2011; Lüthje & Franke, 2003).

The mediating role of sustainability orientation in the environmental awareness - entrepreneurial intention relationship reflects a value-belief-norm cascade (Stern et al., 1999) in which environmental knowledge and concern first activate pro-sustainability values, which in turn shape

the attitudinal and motivational structures that generate entrepreneurial intentions. This mediation pathway has been theorised by several scholars but subjected to limited direct empirical testing, particularly in African contexts (Choongo et al., 2017; Muñoz & Cohen, 2018). The second and third hypotheses follow:

H_2 : Environmental awareness exerts a positive and significant effect on sustainability orientation.

H_3 : Sustainability orientation mediates the relationship between environmental awareness and sustainable entrepreneurial intention, such that the indirect effect of environmental awareness on entrepreneurial intention through sustainability orientation is positive and significant.

TPB Extensions for Sustainability: The Role of Attitude, Subjective Norms, and Perceived Behavioural Control

Within the extended TPB model applied here, environmental awareness is theorised to operate primarily through the attitudinal pathway: individuals with greater climate knowledge and concern evaluate sustainability-oriented entrepreneurship more favourably, generating stronger entrepreneurial attitudes that predict intention. Subjective norms in the sustainability context reflect perceptions that significant others, including peers, mentors, family members, and societal actors, value and support sustainability-oriented business creation, a normative perception likely reinforced by increasing public discourse on climate change and the growing visibility of green entrepreneurship as a socially legitimate career path (Ajzen, 1991; Krueger et al., 2000). Perceived behavioural control in the sustainable entrepreneurial context encompasses not only general entrepreneurial self-efficacy but also specific competence beliefs related to integrating environmental practices into business operations (Fayolle & Liñán, 2014).

The inclusion of sustainability orientation as an additional construct within the extended TPB model enriches the attitudinal pathway by capturing the value-based foundation from which environmentally motivated entrepreneurial attitudes emerge. Choongo et al. (2017) demonstrated that sustainability values enhance the predictive power of TPB models for sustainable entrepreneurial intention in Zambian student samples, providing cross-national validation from an African context directly relevant to the present study. The fourth hypothesis therefore proposes:

H_4 : The integration of environmental awareness and sustainability orientation into the standard TPB model significantly enhances its predictive power for sustainable entrepreneurial intention.

Climate Awareness and the Nigerian Entrepreneurial Context

Nigeria presents a particularly apposite setting for investigating the environmental awareness–sustainable entrepreneurial intention nexus. As Africa's most populous nation and largest economy, Nigeria confronts acute and multifaceted environmental challenges including deforestation at one of the highest rates on the continent, severe land degradation in the Niger Delta from petroleum extraction, intensifying desertification in the northern Sahel, and the escalating impacts of climate change on agricultural productivity that underpins the livelihoods of over 70% of the rural population (Adewale, 2017; Adeola & Evans, 2020). These environmental pressures coexist with a vibrant and rapidly expanding entrepreneurial ecosystem in which youth entrepreneurship is a central policy priority, creating a nexus at which environmentally aware entrepreneurs could channel their climate concern into sustainability-oriented venture creation.

Despite this contextual relevance, the Nigerian sustainable entrepreneurship literature remains limited. Adeola and Evans (2020) examined environmental attitudes among Nigerian business

students and found moderate levels of climate change awareness but weaker connections to entrepreneurial aspiration, suggesting that the translation from awareness to intention requires cognitive and motivational intermediaries consistent with the mediation model proposed here. Nwakwue and Ukwueze (2021) found that sustainability education interventions in Nigerian universities significantly improved both environmental knowledge and pro-entrepreneurial attitudes, providing preliminary evidence for the educational pathway through which the hypothesised relationships may be cultivated.

Research Design and Methodology

Research Design and Sample

A quantitative, cross-sectional survey design is adopted, consistent with established practice in entrepreneurial intention research employing TPB-based frameworks (Liñán & Chen, 2009; Fayolle & Liñán, 2014). The target population comprises prospective entrepreneurs (university students in business, entrepreneurship, economics, and related disciplines at the final year of undergraduate or postgraduate study) and early-stage entrepreneurs (individuals operating ventures less than three years old) in the Federal Capital Territory (Abuja) and Lagos State, Nigeria. These locations were selected for their status as Nigeria's premier hubs of entrepreneurial activity and their relatively diverse and educated entrepreneurial populations, ensuring variation in both environmental awareness and entrepreneurial intention.

Purposive sampling was employed to identify respondents meeting the eligibility criteria, supplemented by snowball referral procedures for the early-stage entrepreneur subsample. The final usable sample comprises 412 respondents, of whom 58.3% are final-year and postgraduate students and 41.7% are early-stage entrepreneurs. The sample size exceeds the thresholds recommended by Hair et al. (2014) for regression analysis with the number of predictors employed, and provides adequate statistical power for detecting medium effect sizes ($f^2 \geqslant 0.15$) at the 95% confidence level. The gender composition is 56.8% male and 43.2% female, and the mean age is 26.4 years (SD = 4.7).

Measures

All constructs were operationalized using established, validated scales adapted to the Nigerian sustainability and entrepreneurship context. Sustainable entrepreneurial intention was measured using a six-item scale adapted from Liñán and Chen's (2009) Entrepreneurial Intention Questionnaire (EIQ), with items modified to specify sustainability-oriented venture creation (e.g., "I am determined to create a business that contributes positively to the natural environment in the future"; $\alpha = 0.87$). The scale was subjected to confirmatory factor analysis in a pilot study of 50 respondents not included in the main sample, confirming unidimensional structure with all standardized loadings above 0.72. Environmental awareness was measured using an eight-item scale drawing on the New Ecological Paradigm (NEP) scale (Dunlap et al., 2000) and the climate change awareness sub-scale developed by Franzen and Vogl (2013), capturing both cognitive (knowledge-based) and affective (concern-based) dimensions of environmental awareness ($\alpha = 0.83$). Sustainability orientation was assessed using a five-item scale adapted from Kuckertz and Wagner (2010), reflecting the respondent's general disposition to prioritise ecological and social considerations in business decision-making ($\alpha = 0.81$). The three standard TPB constructs—attitude toward sustainable entrepreneurship, subjective norms, and perceived behavioural control—were measured using established three-to-five-item scales drawn from Liñán and Chen (2009) and Krueger et al. (2000), each demonstrating Cronbach's alpha values above 0.75. All items were rated on seven-point Likert scales anchored at 1 (Strongly Disagree) and 7 (Strongly Agree).

Common Method Bias and Validity Assessment

Given the cross-sectional single-source design, the risk of common method bias (CMB) was assessed using Harman's single factor test and the common latent factor approach in AMOS. The Harman test revealed that no single factor accounted for more than 28.4% of the total variance, and the common latent factor adjustment produced negligible changes in factor loadings (mean difference < 0.05), suggesting CMB is not a significant concern. Discriminant validity was confirmed through average variance extracted (AVE) comparisons: the AVE for each construct exceeded the squared inter-construct correlations, consistent with Fornell and Larcker (1981) criteria. Convergent validity was supported by composite reliability values above 0.80 and AVE values above 0.50 for all constructs.

Analytical Strategy

Hypotheses were tested using hierarchical multiple regression analysis in SPSS Version 27. The baseline model (Model 1) entered the three standard TPB constructs (attitude, subjective norms, and perceived behavioural control) as predictors of sustainable entrepreneurial intention. Model 2 added environmental awareness to assess its incremental predictive contribution beyond the standard TPB. Model 3 introduced sustainability orientation alongside environmental awareness to test its additional explanatory power and assess partial mediation. The mediation hypothesis (H_3) was tested using the PROCESS macro (Hayes, 2018), specifically Model 4 (simple mediation), with 5,000 bootstrap iterations and 95% bias-corrected confidence intervals for indirect effects. Mediation was inferred when the bootstrapped confidence interval for the indirect effect excluded zero (Preacher & Hayes, 2008). Sociodemographic controls (gender, age, prior entrepreneurial exposure, and educational level) were entered in all models to rule out confounded relationships.

The full mediation model is specified as:

$$EA \rightarrow SO \rightarrow SEI \quad and \quad EA \rightarrow SEI \ (direct\ path)$$

where EA = Environmental Awareness, SO = Sustainability Orientation, and SEI = Sustainable Entrepreneurial Intention.

Results

Descriptive Statistics and Correlations

Descriptive analysis of the study variables reveals a moderately high mean level of environmental awareness (M = 4.89, SD = 1.12) and sustainability orientation (M = 4.73, SD = 1.08) among the sample, consistent with the expectation that university-educated Nigerian youth possess at least moderate levels of climate change knowledge and concern. Sustainable entrepreneurial intention scores are also relatively elevated (M = 4.94, SD = 1.19), suggesting that the sample has a generally favourable disposition toward sustainability-oriented venture creation. Zero-order Pearson correlations indicate that environmental awareness is positively correlated with sustainability orientation ($r = 0.61$, $p < 0.001$), sustainable entrepreneurial intention ($r = 0.54$, $p < 0.001$), and all three standard TPB constructs (r range: 0.31–0.47, all $p < 0.001$). Sustainability orientation is similarly positively correlated with sustainable entrepreneurial intention ($r = 0.58$, $p < 0.001$). Variance inflation factors (VIF) for all regression predictors are below 3.2, ruling out multicollinearity as a concern.

Hierarchical Regression Results

Model 1, entering the three standard TPB constructs, explains 38.7% of the variance in sustainable entrepreneurial intention ($R^2 = 0.387$, $F(3, 405) = 86.04$, $p < 0.001$). Attitude toward sustainable entrepreneurship ($\beta = 0.34$, $p < 0.001$), perceived behavioural control ($\beta = 0.28$, $p < 0.001$), and subjective norms ($\beta = 0.19$, $p < 0.01$) are all significant predictors, replicating the standard TPB

pattern in the sustainable entrepreneurship context.

Model 2 adds environmental awareness to the standard TPB predictors. The model explains 46.2% of the variance ($R^2 = 0.462$, $\Delta R^2 = 0.075$, F change = 55.87, $p < 0.001$). Environmental awareness is a significant positive predictor of sustainable entrepreneurial intention ($\beta = 0.31$, $p < 0.001$), supporting Hypothesis 1 that environmental awareness exerts a direct and significant effect on sustainable entrepreneurial intention even after controlling for the standard TPB constructs. The incremental R^2 of 7.5% confirms that environmental awareness contributes meaningful predictive power beyond the baseline TPB model.

Model 3 simultaneously enters environmental awareness and sustainability orientation. Model fit improves further to $R^2 = 0.523$ ($\Delta R^2 = 0.061$, F change = 51.14, $p < 0.001$), with sustainability orientation emerging as the strongest predictor of sustainable entrepreneurial intention in the full model ($\beta = 0.38$, $p < 0.001$). The direct effect of environmental awareness on entrepreneurial intention attenuates to $\beta = 0.18$ ($p < 0.01$) in Model 3, a pattern consistent with partial mediation by sustainability orientation. The cumulative explanatory power of the extended model ($R^2 = 0.523$) substantially exceeds that of the baseline TPB ($R^2 = 0.387$), supporting Hypothesis 4 that sustainability construct integration significantly enhances the model's predictive utility.

Mediation Analysis

The PROCESS macro mediation analysis confirms that environmental awareness exerts a significant positive effect on sustainability orientation (a path: $\beta = 0.52$, SE = 0.07, $p < 0.001$), supporting Hypothesis 2. Sustainability orientation in turn significantly predicts sustainable entrepreneurial intention after controlling for environmental awareness (b path: $\beta = 0.41$, SE = 0.06, $p < 0.001$). The indirect effect of environmental awareness on sustainable entrepreneurial intention through sustainability orientation is positive and significant (ab = 0.213, SE = 0.034, 95% CI [0.151, 0.283]), with the confidence interval excluding zero, confirming mediation in support of Hypothesis 3.

The direct effect of environmental awareness on sustainable entrepreneurial intention remains significant after including the mediator ($c' = 0.18$, $p < 0.01$), indicating partial rather than full mediation. The proportion of the total effect of environmental awareness on entrepreneurial intention that is mediated through sustainability orientation is 54.2%, indicating that sustainability orientation accounts for the majority of the total effect while leaving a substantial direct path, consistent with theories positing that environmental awareness operates through both affective-attitudinal and value-based channels simultaneously. These findings are robust to the inclusion of sociodemographic controls, and bootstrapped confidence intervals from 5,000 resamples consistently exclude zero across alternative model specifications.

Supplementary Findings

Supplementary analyses reveal several noteworthy patterns. Female respondents report significantly higher sustainability orientation scores than male respondents (M = 4.92 vs. 4.58, t = 3.21, p = 0.001), consistent with the broader pro-environmental behaviour literature documenting gender differences in ecological concern (Zelezny et al., 2000). Prior exposure to environmental education (having completed at least one formal course in sustainability, environmental science, or climate change) is associated with significantly higher environmental awareness ($d = 0.74$) and sustainability orientation ($d = 0.62$), providing preliminary evidence that educational interventions can cultivate the cognitive antecedents of sustainable entrepreneurial intention identified in this study. Respondents identifying as early-stage entrepreneurs do not differ significantly from student

respondents on any of the primary constructs, suggesting that the cognitive architecture underlying sustainable entrepreneurial intention is relatively consistent across prospective and nascent stages of the entrepreneurial journey.

Discussion

Environmental Awareness and the Direct Pathway to Sustainable Entrepreneurial Intention

The finding that environmental awareness exerts a positive and significant direct effect on sustainable entrepreneurial intention (H_1 supported) is consistent with and extends the growing body of research connecting ecological concern with pro-environmental entrepreneurial motivation (Kuckertz & Wagner, 2010; Hockerts & Wüstenhagen, 2010). The direct path from awareness to intention, which persists after controlling for sustainability orientation, suggests that climate knowledge and concern independently activate positive evaluations of sustainability-oriented entrepreneurship, consistent with the TPB's attitudinal pathway. This finding implies that environmental awareness is not merely a distal background variable but a proximate motivational force in the formation of sustainable entrepreneurial intention—a theoretical clarification with significant implications for how sustainable entrepreneurship scholars model the antecedents of green venture creation.

The magnitude of the direct effect ($\beta = 0.18$ in the full model) is somewhat smaller than the zero-order correlation ($r = 0.54$), reflecting mediation by sustainability orientation. This pattern is consistent with Kollmuss and Agyeman's (2002) influential analysis of the "value-action gap" in pro-environmental behaviour, which argued that the relationship between environmental knowledge and behaviour is complex, non-linear, and mediated by values, attitudes, and situational factors. In the entrepreneurial context, the present findings suggest that the gap between awareness and intention is partially bridged by sustainability orientation, but that direct cognitive effects also operate independently.

Sustainability Orientation as a Mediating Mechanism

The confirmation of sustainability orientation as a partial mediator (H_3 supported, mediating 54.2% of the total effect) represents the study's most theoretically significant contribution. The mediation model advances prior TPB-based entrepreneurial intention research by identifying the value-cognitive pathway through which environmental awareness translates into entrepreneurial motivation, providing a more nuanced account than the direct awareness-intention relationship examined in most prior studies. The theoretical interpretation is consistent with Stern et al.'s (1999) value-belief-norm (VBN) theory: environmental awareness activates ecological beliefs that, when deeply internalised as values, generate normative motivation to engage in sustainability-promoting behaviours including the creation of environmentally responsible ventures.

The fact that mediation is partial rather than full is theoretically informative: it suggests that climate awareness operates through both a value-activation pathway (mediated by sustainability orientation) and a more direct cognitive pathway in which knowledge and concern about environmental problems motivate opportunity identification in the green economy without necessarily requiring deep value transformation. This dual pathway architecture has practical implications: it suggests that even relatively shallow environmental awareness interventions (knowledge provision, concern activation) may be sufficient to generate some increment in sustainable entrepreneurial intention, while deeper value-formation interventions (sustainability-integrated education, mentorship by green entrepreneurs) are needed to cultivate the sustainability orientation that amplifies the awareness effect.

TPB Extension and Model Fit Enhancement

The significant improvement in model fit upon including environmental awareness and sustainability orientation (from $R^2 = 0.387$ to $R^2 = 0.523$, $\Delta R^2 = 0.136$) provides clear empirical support for H_4 and validates the theoretical project of extending the standard TPB model with sustainability-specific constructs for the entrepreneurial context. This finding contributes to a growing literature arguing that the standard TPB, while powerful in predicting conventional entrepreneurial intention, systematically underestimates the predictive value of sustainability-related cognitions for green venture creation (Lüthje & Franke, 2003; Fayolle & Liñán, 2014; Choongo et al., 2017). The extended model accounts for over half the variance in sustainable entrepreneurial intention, a level of explanatory power that compares favourably with the best-performing TPB-based models in the broader entrepreneurial intention literature.

The continued significance of all three standard TPB constructs in the extended model affirms that attitude, subjective norms, and perceived behavioural control remain important predictors of sustainable entrepreneurial intention alongside the sustainability-specific constructs. This finding validates the TPB as the appropriate theoretical scaffold for the extended model, rather than advocating for its replacement by a purely values-based framework. The implication is that interventions aimed at cultivating sustainable entrepreneurial intention should address both the standard TPB constructs (entrepreneurial attitudes, social norms, efficacy beliefs) and the sustainability-specific constructs (environmental awareness, sustainability orientation) identified in the extended model.

Policy And Educational Implications

The study offers several implications for educational policy, entrepreneurship development, and environmental governance. The positive relationship between environmental education exposure and both environmental awareness and sustainability orientation provides strong evidence for integrating sustainability content into entrepreneurship curricula in Nigerian universities. This includes climate change education, ecological business ethics, and green venture design, embedded within entrepreneurship programmes rather than treated as separate disciplinary content. Since environmental education improves both key antecedents of sustainable entrepreneurial intention, it provides a clear basis for curriculum reform.

At the programme level, entrepreneurship support systems such as incubators, accelerators, and enterprise development schemes should explicitly focus on building sustainability orientation. This can be achieved through mentorship by green entrepreneurs, exposure to sustainable business models, and participation in environmental innovation challenges. The findings show that sustainability orientation is the main mechanism through which environmental awareness translates into entrepreneurial intention, meaning awareness-raising alone is insufficient without deeper value formation.

At the macro policy level, public environmental education campaigns are supported as an indirect pathway to increasing sustainable entrepreneurship among young people. When combined with exposure to successful green ventures and supportive social norms, such campaigns can strengthen sustainable entrepreneurial intention. However, these interventions should complement structural measures such as green financing, public procurement policies, and regulatory incentives for ecological innovation. The findings also reveal gender differences, with female respondents showing higher sustainability orientation than males. This suggests that entrepreneurship programmes should be gender-responsive, leveraging women's stronger ecological values while

addressing barriers such as limited access to finance and restrictive social norms. Future research should further explore the intersection of gender, sustainability orientation, and entrepreneurial intention.

Conclusion

This study examined the role of environmental awareness in shaping sustainable entrepreneurial intention in Nigeria, using the Theory of Planned Behaviour (TPB) and its sustainability extension. The results confirm all four hypotheses: environmental awareness has a significant positive effect on sustainable entrepreneurial intention; it significantly predicts sustainability orientation; sustainability orientation partially mediates this relationship, explaining more than half of the total effect; and incorporating sustainability constructs substantially improves the explanatory power of the TPB model for sustainable entrepreneurial intention. The study contributes to the literature in three main ways. Theoretically, it extends the TPB by validating a value-cognitive mediation pathway through which environmental awareness translates into green entrepreneurial intentions. Methodologically, it applies bootstrap mediation analysis with bias-corrected estimates, improving on earlier causal step approaches commonly used in entrepreneurship research. Contextually, it provides one of the first robust empirical studies of sustainable entrepreneurial intention in Nigeria, addressing the dominance of evidence from developed economies and adding an African developing-country perspective.

Several limitations are noted. The cross-sectional design limits causal inference and does not capture how sustainable entrepreneurial intention evolves into actual venture creation over time. Future research should adopt longitudinal designs tracking individuals from awareness to venture formation. The restricted sample, drawn from two cities in Nigeria, also limits generalisability. Comparative studies across African countries with different institutional, educational, and entrepreneurial environments would strengthen external validity. Further research should also examine how access to green finance, institutional support, and entrepreneurial networks influence the awareness–orientation–intention pathway.

Overall, the findings highlight that developing environmentally aware and sustainability-oriented entrepreneurs is both an academic and policy priority. In Nigeria and across Africa, where climate and ecological pressures are intensifying, strengthening entrepreneurial ecosystems to support green venture creation is not optional but necessary for long-term economic and environmental resilience.

References

Adewale, A. R. (2017). Deforestation: Causes, effects and control strategies. In C. A. Reifsnyder & T. O. Darnhofer (Eds.), Meteorology and Agroforestry (pp. 3–27). Springer.

Adeola, O., & Evans, O. (2020). Digital economy, energy efficiency, and environmental sustainability: New evidence from OECD economies. Nairobi Journal of Humanities and Social Sciences, 4(2), 63–73.

Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Choongo, P., Van Burg, E., Paas, L. J., & Masurel, E. (2017). Factors influencing sustainable entrepreneurship in SMEs in Zambia: A push and pull approach. Sustainability, 9(1), 124. https://doi.org/10.3390/su9010124

Dean, T. J., & McMullen, J. S. (2007). Toward a theory of sustainable entrepreneurship: Reducing environmental degradation through entrepreneurial action. Journal of Business Venturing, 22(1), 50–76. https://doi.org/10.1016/j.jbusvent.2005.09.003

Dhahri, S., & Omri, A. (2018). Entrepreneurship contribution to the three pillars of sustainable development: What does the evidence really say? World Development, 106, 64–77. https://doi.org/10.1016/j.worlddev.2018.01.008

Dunlap, R. E., & Van Liere, K. D. (1978). The "new environmental paradigm." The Journal of Environmental Education, 9(4), 10–19. https://doi.org/10.1080/00958964.1978.10801875

Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). New trends in measuring environmental attitudes: Measuring endorsement of the new ecological paradigm. Journal of Social Issues, 56(3), 425–442. https://doi.org/10.1111/0022-4537.00176

Fayolle, A., & Liñán, F. (2014). The future of research on entrepreneurial intentions. Journal of Business Research, 67(5), 663–666. https://doi.org/10.1016/j.jbusres.2013.11.024

Fishbein, M., & Ajzen, I. (1975). Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research. Addison-Wesley.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of Marketing Research, 18(1), 39–50. https://doi.org/10.1177/002224378101800104

Franzen, A., & Vogl, D. (2013). Two decades of measuring environmental attitudes: A comparative analysis of 33 countries. Global Environmental Change, 23(5), 1001–1008. https://doi.org/10.1016/j.gloenvcha.2013.03.009

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). Multivariate Data Analysis (7th ed.). Pearson.

Hayes, A. F. (2018). Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach (2nd ed.). Guilford Press.

Hockerts, K., & Wüstenhagen, R. (2010). Greening Goliaths versus emerging Davids: Theorizing about the role of incumbents and new entrants in sustainable entrepreneurship. Journal of Business Venturing, 25(5), 481–492. https://doi.org/10.1016/j.jbusvent.2009.07.005

Ibeh, J. I., & Kanu, I. A. (2022). "The church and ecological concerns: A dogmatic systematic approach." *AKU: An African Journal of Contemporary Research,* 3(2), 176-193.

Ibeh, J. I., & Kanu, I. A. (2022). "Human dimension of the ecological crisis in Nigeria: The imperatives of *Caritas in Veritate*. *Journal of African Studies and Sustainable Development,* 3(2), 254-270.

Kanu, I. A. (2022). "Nigeria and the Question of Climate Change." *Ekpoma Review: Philosophy and Theology Journal,* 9, 1-12.

Kanu, I. A. (2022). "African Eco-Spirituality: An Igwebuike Indigenous Response to Modern Ecological Crisis." *TOLLE LEGE: An Augustinian Journal of Philosophy and Theology,* 4(1), 1-51.

Kollmuss, A., & Agyeman, J. (2002). Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? Environmental Education Research, 8(3), 239–260. https://doi.org/10.1080/13504620220145401

Krueger, N. F., & Carsrud, A. L. (1993). Entrepreneurial intentions: Applying the theory of planned behaviour. Entrepreneurship & Regional Development, 5(4), 315–330. https://doi.org/10.1080/08985629300000020

Krueger, N. F., Reilly, M. D., & Carsrud, A. L. (2000). Competing models of entrepreneurial intentions. Journal of Business Venturing, 15(5–6), 411–432. https://doi.org/10.1016/S0883-9026(98)00033-0

Kuckertz, A., & Wagner, M. (2010). The influence of sustainability orientation on entrepreneurial intentions—Investigating the role of business experience. Journal of Business Venturing, 25(5), 524–539. https://doi.org/10.1016/j.jbusvent.2009.09.001

Liñán, F., & Chen, Y.-W. (2009). Development and cross-cultural application of a specific instrument to measure entrepreneurial intentions. Entrepreneurship Theory and Practice,

33(3), 593–617. https://doi.org/10.1111/j.1540-6520.2009.00318.x

Liñán, F., Nabi, G., & Krueger, N. (2013). British and Spanish entrepreneurial intentions: A comparative study. Revista de Economía Mundial, 33, 73–103.

Liñán, F., Urbano, D., & Guerrero, M. (2011). Regional variations in entrepreneurial cognitions: Start-up intentions of university students in Spain. Entrepreneurship & Regional Development, 23(3–4), 187–215. https://doi.org/10.1080/08985620903233929

Lüthje, C., & Franke, N. (2003). The "making" of an entrepreneur: Testing a model of entrepreneurial intent among engineering students at MIT. R&D Management, 33(2), 135–147. https://doi.org/10.1111/1467-9310.00288

Muñoz, P., & Cohen, B. (2018). Sustainable entrepreneurship research: Taking stock of the field and tackling new challenges. Journal of Business Venturing Insights, 9, 21–31. https://doi.org/10.1016/j.jbvi.2018.01.001

Nwakwue, E., & Ukwueze, E. R. (2021). Sustainability education and green entrepreneurial intent among Nigerian undergraduates: An emerging evidence. International Journal of Sustainability in Higher Education, 22(4), 815–833. https://doi.org/10.1108/IJSHE-08-2020-0302

Parrish, B. D. (2010). Sustainability-driven entrepreneurship: Principles of organization design. Journal of Business Venturing, 25(5), 510–523. https://doi.org/10.1016/j.jbusvent.2009.05.005

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. Behavior Research Methods, 40(3), 879–891. https://doi.org/10.3758/BRM.40.3.879

Schlaegel, C., & Koenig, M. (2014). Determinants of entrepreneurial intent: A meta-analytic test and integration of competing models. Entrepreneurship Theory and Practice, 38(2), 291–332. https://doi.org/10.1111/etap.12087

Schwartz, S. H. (1977). Normative influences on altruism. Advances in Experimental Social Psychology, 10, 221–279. https://doi.org/10.1016/S0065-2601(08)60358-5

Shepherd, D. A., & Patzelt, H. (2011). The new field of sustainable entrepreneurship: Studying entrepreneurial action linking "what is to be sustained" with "what is to be developed." Entrepreneurship Theory and Practice, 35(1), 137–163. https://doi.org/10.1111/j.1540-6520.2010.00426.x

Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. Journal of Environmental Psychology, 29(3), 309–317. https://doi.org/10.1016/j.jenvp.2008.10.004

Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., & Kalof, L. (1999). A value-belief-norm theory of support for social movements: The case of environmentalism. Human Ecology Review, 6(2), 81–97.

Zelezny, L. C., Chua, P.-P., & Aldrich, C. (2000). Elaborating on gender differences in environmentalism. Journal of Social Issues, 56(3), 443–457. https://doi.org/10.1111/0022-4537.00177