



Driving Green Business Practices through Environmental Awareness among MSMEs in Ibu Kota Nusantara (IKN)

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Abstract

Environmental sustainability is a critical agenda for micro, small, and medium enterprises (MSMEs) supporting the development of Indonesia's new capital, Ibu Kota Nusantara (IKN). This study examines the influence of environmental awareness on green business practices among MSMEs in the IKN region, including Samarinda, Balikpapan, Kutai Kartanegara, and Paser. Using a quantitative approach with data from 90 MSME actors, this research evaluates how cognitive environmental factors translate into sustainable operational behavior. The structural equation modeling (PLS-SEM) analysis reveals that environmental awareness has a positive and significant effect on green entrepreneurial intention ($\beta = 0.914$; $t = 14.536$; $p < 0.001$), which in turn significantly drives green business behavior ($\beta = 0.835$; $t = 8.853$; $p < 0.001$). The model demonstrates strong predictive power, with environmental awareness and intention explaining 83.6% and 69.7% of the variance in their respective target constructs. These results indicate that MSMEs with higher levels of environmental understanding are significantly more likely to implement eco-friendly production and managerial activities. These findings highlight the importance of internal cognitive factors in shaping sustainable business behavior. From a practical perspective, the results suggest that the IKN Authority and MSME support institutions should prioritize environmental literacy programs and targeted green business training. Strengthening environmental awareness is essential to ensuring local enterprises actively contribute to the long-term sustainability goals of the new capital. By fostering environmental consciousness, policymakers can effectively accelerate the transition toward a green economy among regional MSMEs.

Keywords: *Environmental Awareness; Green Business Practices; Sustainable Entrepreneurship; MSMEs*

INTRODUCTION

Global sustainability challenges have increasingly reshaped business behavior, shifting attention from profit-oriented models toward environmentally responsible business practices. Growing sustainability challenges such as climate change, pollution, environmental degradation, and biodiversity loss have intensified pressure on firms to adopt environmentally responsible business models and respond to increasing demand for green products (Basha & Lal, 2019). Since the adoption of the Sustainable Development Goals (SDGs) in 2015, countries worldwide have been encouraged to integrate social, economic, and environmental considerations into their development frameworks, emphasizing ecosystem conservation, sustainable consumption and production, climate action, and inclusive development (United Nations, 2015; United Nations, 2021).

While the integration of the Sustainable Development Goals (SDGs) has prompted institutional reforms, the practical success of these frameworks often hinges on operational changes within micro, small, and medium enterprises (MSMEs), which collectively exert a significant environmental footprint. Although large corporations frequently lead sustainability

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initiatives, MSMEs contribute substantially to environmental impacts due to their scale and prevalence. Consequently, promoting green business practices among MSMEs has become a critical issue for advancing sustainable development, particularly in developing economies (Rahat & Nguyen, 2023). In Indonesia, this transition is exemplified by the relocation of the national capital to Ibu Kota Nusantara (IKN), which is designed as a “forest city” that prioritizes low-emission development and circular economy principles.

In response to sustainability challenges, the smart city concept has emerged as a strategic policy instrument aimed at strengthening innovation, entrepreneurship, and the quality of public services through the utilization of data and digital technologies (Bakici et al., 2013; Guzman & Stern, 2020). Beyond urban efficiency, smart city ecosystems also facilitate sustainability-oriented business model innovation by improving access to information, infrastructure, and institutional support for businesses (Audretsch et al., 2015; Ji et al., 2021). As such, smart city ecosystems create enabling conditions for MSMEs to implement environmentally responsible business practices.

In Indonesia, sustainability-oriented development has gained strategic momentum following the government’s decision to relocate the national capital to Ibu Kota Nusantara (IKN) in East Kalimantan. Conceived as a smart and sustainable city, IKN integrates environmental governance, digital technologies, energy efficiency, and low-emission development principles (Kementerian PPN/Bappenas, 2022). However, the realization of this vision depends not only on the development of the core city but also on the readiness of surrounding buffer regions, including Samarinda, Balikpapan, Kutai Kartanegara, and Penajam Paser Utara. These areas function as economic support systems for IKN and host a high concentration of micro, small, and medium enterprises (MSMEs), positioning them as critical actors in shaping the broader sustainability outcomes of Indonesia’s new capital.

Prior studies suggest that MSMEs can improve efficiency, competitiveness, and long-term resilience by adopting green business practices such as waste reduction, energy efficiency, and sustainable resource utilization (Ahmed et al., 2022; Mohan et al., 2022). Environmental awareness has been widely recognized as an important internal factor influencing firms’ engagement in environmentally responsible behavior (Basha & Lal, 2019). Nevertheless, empirical evidence indicates that MSMEs often face difficulties in translating environmental awareness into concrete green practices due to limited access to information, financial constraints, and insufficient institutional support (Famiola & Wulansari, 2019; Raharjo, 2019).

Although the literature on green entrepreneurship, smart cities, and MSME sustainability continues to expand, these streams of research are often examined separately. Studies on smart cities emphasize innovation, digital infrastructure, and urban efficiency (Bakici et al., 2013; Audretsch et al., 2015), while research on green entrepreneurship focuses on integrating environmental objectives into business activities (York & Venkataraman, 2010; Lotfi et al., 2018). Limited attention has been given to how large-scale, policy-driven smart city development influences MSME environmental awareness and actual green business practices, particularly in buffer regions outside major metropolitan centers. This represents a contextual and practical research gap, as MSMEs operating in transitional development zones face unique challenges compared to those in established urban economies.

This gap underscores the need for external support mechanisms capable of enabling MSMEs to translate environmental awareness into concrete green business practices. Smart city ecosystems such as Ibu Kota Nusantara (IKN) have the potential to function as catalysts by expanding MSMEs’ access to technology, information systems, and supporting infrastructure that facilitate energy efficiency, waste reduction, and sustainable resource management (Alwakid et al., 2020; Halдар, 2019). Accordingly, the buffer regions surrounding IKN provide a relevant empirical context for examining how policy-driven smart city development shapes environmental awareness

and the adoption of green business practices among MSMEs. This study is therefore positioned as applied research, addressing practical challenges faced by MSMEs in translating sustainability awareness into actual business practices within policy-driven development contexts.

Accordingly, this study seeks to address the following research question: *How does environmental awareness influence the adoption of green business practices among MSMEs in the buffer regions of Ibu Kota Nusantara?* The study addresses practical challenges related to uneven environmental readiness and sustainability adoption among MSMEs within a rapidly evolving policy environment. The findings are expected to contribute theoretically by enriching sustainability and green entrepreneurship research in smart city development contexts, and practically by providing evidence-based insights for policymakers, the IKN Authority, and MSME support institutions in designing targeted interventions to accelerate the adoption of green business practices.

LITERATURE REVIEW

Theory of Planned Behavior (TPB)

This study is grounded in the Theory of Planned Behavior (TPB), which posits that an individual's behavior is determined by their intention to perform that behavior. According to [Ajzen \(1991\)](#), this intention is formed by three core constructs: Attitude (A), Subjective Norms (SN), and Perceived Behavioral Control (PBC). In the context of MSMEs, *Green Entrepreneurial Intention* serves as the cognitive representation of an entrepreneur's readiness to implement sustainable practices. Positioning Environmental Awareness within TPB While TPB identifies the immediate drivers of intention, it also allows for background factors such as values, beliefs, and knowledge that shape these core constructs. In this research, Environmental Awareness is explicitly positioned as a foundational background factor that activates the TPB mechanism through three specific pathways:

1. **Attitude Formation:** Environmental awareness provides the knowledge base regarding ecological degradation. When MSME actors understand the impact of their operations, they develop a more favorable *attitude* toward green entrepreneurship, viewing it as a beneficial and necessary strategy rather than a mere cost burden.
2. **Subjective Norms and Policy Exposure:** In the specific context of the IKN development, environmental awareness increases an entrepreneur's sensitivity to external expectations. High awareness leads to a better understanding of the "green" social and regulatory norms being established by the IKN Authority, thereby strengthening the *subjective norm* to comply with sustainable standards.
3. **Perceived Behavioral Control (PBC):** Awareness often encompasses knowledge of green technologies and efficient resource management. As entrepreneurs become more environmentally aware, their *perceived behavioral control* increases, as they feel more capable and confident in their ability to transition toward eco-friendly business models despite technical or financial constraints.

By mapping environmental awareness onto these TPB constructs, this study moves beyond a simple direct-effect model. It argues that awareness acts as the cognitive catalyst that shapes the mindset (Attitude), recognizes the social-policy pressure (Subjective Norms), and builds the perceived capability (PBC) of MSME actors to form a strong green entrepreneurial intention, which ultimately culminates in actual green business behavior.

Environmental Awareness

Environmental awareness reflects the extent to which individuals or business actors understand environmental issues and recognize the consequences of their activities on ecological systems. Prior studies consistently show that individuals with higher levels of environmental concern are more likely to engage in pro-environmental behavior ([Fu et al., 2018](#); [Kousar et al.,](#)

2022). In other words, increased environmental awareness strengthens individuals' willingness to adopt environmentally responsible actions (Zhang et al., 2014), including a greater willingness to bear additional costs associated with environmentally friendly practices (Li et al., 2022).

Environmental knowledge also plays an important role in facilitating pro-environmental behavior. Individuals who possess greater environmental knowledge tend to be more capable of consciously implementing environmentally responsible actions in their daily activities (Shen et al., 2022). The development of appropriate environmental values can reduce the negative environmental impacts of business activities and motivate actors to take concrete measures to improve their behavioral practices (Wang et al., 2020). Conversely, low levels of environmental awareness limit access to environmental knowledge, reduce participation in environmental initiatives, and hinder the consistent adoption of pro-environmental behavior (Ahmad et al., 2021).

In the context of micro, small, and medium enterprises (MSMEs), environmental awareness represents an important internal factor that shapes business decision-making. MSME owners with higher environmental awareness are more likely to recognize the relevance of environmental considerations in their operations, which may influence the extent to which they adopt environmentally responsible business practices.

Green Entrepreneurial Intention

Green Entrepreneurial Intention (GEI) refers to a self-acknowledged belief or interest in starting an environmentally friendly business (Ip, 2021). According to the Theory of Planned Behavior (TPB) (Ajzen, 1991), entrepreneurial intention can drive entrepreneurial behavior because individuals who intend to start a business tend to be more skilled in business and entrepreneurship (Gieure et al., 2020). The positive relationship between entrepreneurial intention and behavior has been demonstrated in studies consistent with the TPB framework (Alam, 2019; Neneh, 2019). In addition, GEI has been identified as an indirect predictor of green entrepreneurial behavior, mediated by support from universities and government institutions (Yi, 2021).

In the context of MSMEs, green entrepreneurial intention represents a critical psychological mechanism through which environmental awareness is translated into actual green business behavior. Environmental awareness and knowledge can enhance Green Entrepreneurial Intention (Noor & Rabbani, 2023), as individuals possessing such knowledge often prioritize sustainability and environmental protection, which motivates them to view green entrepreneurship as an opportunity to align their actions with their values. Individuals may develop more positive attitudes and greater confidence in starting green businesses when they possess environmental knowledge and values (Yasir et al., 2023), which can help reduce perceived barriers to green entrepreneurship.

Based on the preceding discussion, several hypotheses have been formulated for this study. Green entrepreneurial intention is positioned in this study as a mediating variable that links environmental awareness to actual green business behavior. Thus, green entrepreneurial intention represents the motivational mechanism through which environmental awareness is translated into concrete sustainability-oriented business actions.

Green Business Behavior

Green business behavior refers to the implementation of environmentally responsible actions in business operations, reflecting firms' commitment to environmental sustainability. Pro-environmental behavior is shaped by beliefs, values, norms, and attitudes toward environmental protection, where business actors with positive environmental attitudes are more likely to adopt environmentally friendly management practices (Stern, 2000; Schultz et al., 2004; Stern, 2000).

At the organizational level, green business behavior is evident when environmental considerations are integrated into organizational culture, strategic decision-making, and

interactions with stakeholders (Linnenluecke & Griffiths, 2010). Such integration moves firms beyond symbolic environmental actions toward systematic implementation of sustainability practices. Importantly, environmentally responsible behavior is also associated with economic benefits, including efficiency gains, risk reduction, and improved financial performance (Zwetsloot & Van Marrewijk, 2004).

Accordingly, green business behavior is viewed as the behavioral outcome of sustainability-oriented intentions shaped by environmental awareness. From an entrepreneurial perspective, green business behavior is supported by sustainability-oriented entrepreneurial orientation and dynamic capabilities. Entrepreneurial firms can reconfigure resources and capabilities to respond to environmental challenges and exploit sustainability-related opportunities (Jantunen et al., 2005). Empirical evidence shows that firms with strong sustainability orientation demonstrate higher levels of innovation and creativity, which enhances stakeholder support and access to financial resources for sustainable initiatives (Kuckertz & Wagner, 2010; Calic & Mosakowski, 2016).

The translation of awareness into action typically depends on motivational mechanisms that bridge values and behavior. The Theory of Planned Behavior (TPB) explains this process by identifying intention as the most immediate predictor of behavior (Ajzen, 1991). Empirical studies in entrepreneurial contexts confirm that stronger entrepreneurial intentions significantly increase the likelihood of engaging in entrepreneurial behavior (Alam, 2019; Neneh, 2019). Accordingly, green business behavior is viewed as the behavioral manifestation of sustainability-oriented intentions shaped by environmental awareness.

RESEARCH METHOD

This study employs an explanatory quantitative research design with a cross-sectional survey approach. While the conceptual framework is constructed to examine the directional paths between environmental awareness and green business behavior, the researchers acknowledge that data collected at a single point in time limits the ability to draw definitive causal inferences. Consequently, the analysis focuses on testing the structural relationships and the predictive strength of the constructs as supported by the Theory of Planned Behavior (TPB). The field observations conducted between June and August 2025 were utilized exclusively for contextual mapping and facilitating field access to strengthen the understanding of the IKN buffer zone's characteristics, rather than serving as a formal qualitative analysis component; thus, this study remains a strictly quantitative evaluation.

Data were collected using a purposive sampling technique targeting 90 MSME actors within the IKN buffer regions, specifically Samarinda, Balikpapan, Kutai Kartanegara, and Paser. To ensure a clear operational definition, explicit inclusion criteria were established for "green-oriented small enterprises": (1) MSMEs that have been operational for at least two years within the designated IKN buffer zones; (2) enterprises that have implemented at least one documented eco-friendly initiative (e.g., waste reduction programs, use of biodegradable packaging, or energy-efficient equipment); and (3) respondents who hold ownership or managerial positions with decision-making authority over operational practices. These criteria ensure that the respondents possess the necessary experience and relevant insights into sustainable business practices.

The research instrument was adapted from established environmental behavior scales and contextualized for the regional environment of East Kalimantan. To ensure content validity and linguistic equivalence, the adaptation process involved several rigorous stages, beginning with a back-translation procedure conducted by independent bilingual experts to translate items from English to Indonesian. Subsequently, the items were refined to reflect specific environmental challenges related to the IKN development, followed by an expert review by scholars in sustainable

entrepreneurship. Prior to final data collection, a pilot study was conducted with 15 MSME actors to identify and rectify ambiguous phrasing, ensuring the reliability of the instrument during the full-scale distribution.

Data analysis was performed using Partial Least Squares Structural Equation Modeling (PLS-SEM), selected for its robustness in predicting target constructs and examining complex mediating paths. The analytical procedure consisted of two primary stages: the evaluation of the measurement model (outer model) to test convergent validity, discriminant validity, and internal consistency; and the evaluation of the structural model (inner model) to test the significance of the hypothesized paths and the model's predictive power (R²). Consistent with the inherent limitations of the research design, the results are interpreted as statistically significant predictive associations rather than absolute experimental causality, thereby maintaining empirical integrity within the boundaries of survey-based methodology (Hair et al., 2017; Hair et al., 2019).

FINDINGS AND DISCUSSION

Respondent Demographics and Descriptive Statistics

The final sample consisted of 90 MSME actors. After the pilot study and initial measurement model assessment, the number of indicators was refined to ensure construct validity. The final instrument retained 5 items for Environmental Awareness, 6 items for Green Entrepreneurial Intention, and 4 items for Green Business Behavior.

Table 1. Respondent Demographics and Descriptive Statistics

Variable	Category	Frequency	Percentage (%)	Mean	SD
Gender	Male	42	47	-	-
	Female	48	53	-	-
Business Sector	F&B	55	61.1	-	-
	Craft / Service	35	38.9	-	-
Environmental Awareness (X)	5 Indicators	-	-	4.12	0.68
Green Ent. Intention (M)	6 Indicators	-	-	3.95	0.72
Green Business Behavior (Y)	4 Indicators	-	-	3.88	0.81

Measurement Model Assessment

The measurement model was evaluated for reliability and validity. While Cronbach's Alpha and Composite Reliability exceeded 0.70, the Heterotrait-Monotrait Ratio (HTMT) analysis revealed values near 0.94 between Awareness and Intention. The HTMT ratio (Heterotrait-Monotrait) values reflect the strength of relationships between constructs. The findings indicate a high degree of correlation between Environmental Awareness and both Green Business Behavior and Green Entrepreneurial Intention.

Table 2. Heterotrait-Monotrait Ratio

Construct	Environmental Awareness	Green Business Behavior	Green Entrepreneurial Intention
Environmental Awareness	-	0.964	0.960
Green Business Behavior	0.964	-	0.883
Green Entrepreneurial Intention	0.960	0.883	-

Construct	Environmental Awareness	Green Business Behavior	Green Entrepreneurial Intention
Intention			

The HTMT analysis (Table 2) reveals values between Environmental Awareness and Green Entrepreneurial Intention (0.960), and Awareness and Green Business Behavior (0.964), that exceed the 0.90 threshold. This suggests a lack of discriminant validity between these constructs in the current sample. This high overlap may be attributed to the strong 'Forest City' policy discourse in the IKN buffer regions, which may lead MSME actors to perceive environmental knowledge and business intention as a singular unified concept. While this limits the empirical distinctiveness of the variables, it highlights a high level of cognitive integration regarding sustainability among local entrepreneurs.

Structural Model Evaluation

The structural model tests the hypothesized paths. Bootstrapping was used to evaluate path coefficients and statistical significance. The path coefficient results show that Environmental Awareness has a strong and significant positive effect on Green Entrepreneurial Intention, with a coefficient of 0.914, a T-statistic of 14.536, and a P-value of <0.001. This finding confirms the research hypothesis that higher environmental awareness leads to stronger intentions to engage in environmentally responsible entrepreneurial activities.

Table 3. Path Coefficients and Effect Sizes (f2)

Path	Coefficient (β)	t-stat	p-value	f ²	Size
EA → GEI	1	15	<0.001	0.38	Large
GEI → GB	1	9	<0.001	0.29	Medium-Large

Table 4. Coefficient of Determination (R²)

Endogenous Construct	R ²	R ² Adjusted
Green Entrepreneurial Intention	1	1
Green Business Behavior	1	1

The R-Square values reflect the model's predictive power. For Green Business Behavior, the R² value is 0.697, indicating that 69.7% of the variance in Green Business Behavior is explained by the model. The Green Entrepreneurial Intention model explains 83.6% of the variance, confirming its strong predictive power.

Mediation Analysis

To determine the role of Green Entrepreneurial Intention, a specific indirect effect test was conducted.

Table 5. Mediation Results

Relationship	Direct Effect	Indirect Effect	Total Effect	Result
EA -> GEI -> GBB	0.125 (p=0.21)	0.763 (p<0.001)	0.888	Full Mediation

Based on Table 5. Environmental Awareness does not have a significant direct effect on Behavior when Intention is included in the model. This confirms that awareness must be transformed into a conscious intention before it manifests as concrete green business practices.

The results of the Partial Least Squares Structural Equation Modeling (PLS-SEM) provide strong empirical support for the hypothesized relationships within the framework. Regarding the first hypothesis (H1), environmental awareness was found to have a substantial and statistically significant positive influence on green entrepreneurial intention ($\beta=0.914$; $t=14.536$; $p<0.001$). The R2 value of 0.836 indicates that environmental awareness explains approximately 83.6% of the variance in intention, demonstrating exceptionally high predictive power. This finding reinforces the Theory of Planned Behavior (TPB), suggesting that heightened ecological values foster more favorable evaluations of sustainable business models among MSME actors in the IKN buffer regions (Ajzen, 1991). The strength of this relationship aligns with recent studies by Noor and Rabbani (2023) and Yasir et al. (2023), likely intensified by the salience of sustainability narratives surrounding the "Forest City" development of the new capital.

Furthermore, the analysis confirms that green entrepreneurial intention is a significant predictor of actual green business behavior, supporting H2 ($\beta=0.835$; $t=8.853$; $p<0.001$). With an R2 value of 0.697, the model shows that intention explains nearly 70% of the variance in behavioral outcomes. This result validates the intention-behavior linkage central to TPB, confirming that MSME owners with firm green commitments are significantly more likely to implement environmentally responsible operations (Neneh, 2019; Alam, 2019). In the specific context of the IKN buffer zones, where sustainability is embedded in regional development policies, these intentions appear to translate effectively into concrete organizational practices.

Finally, the mediation analysis supports H3, revealing that green entrepreneurial intention serves as a critical psychological bridge between environmental awareness and green business behavior. The results indicate that awareness does not directly manifest as behavior but must first be transformed into a deliberate entrepreneurial intent. This mechanism reinforces the assertion that intention is the most proximal determinant of behavior (Ajzen, 1991) and aligns with the Value-Belief-Norm (VBN) theory, which emphasizes the progression from values to specific actions (Stern, 2000). Within this framework, green entrepreneurial intention functions as the essential catalyst that converts general environmental concern into operational business practices in the IKN landscape.

CONCLUSIONS

This study investigated the relationship between environmental awareness and green business behavior among MSMEs in the buffer regions of Indonesia's new capital, Ibu Kota Nusantara (IKN). The results demonstrate that environmental awareness serves as a powerful predictor of green entrepreneurial intention, which in turn acts as a full mediator toward actual green business behavior. Specifically, while awareness alone is a necessary foundation, it does not directly translate into operational changes unless it is first internalized as a deliberate entrepreneurial intent.

The high predictive power (R2) and strong path coefficients observed in this study suggest a unique cognitive alignment among regional MSME actors, likely driven by the pervasive "Forest City" policy discourse. However, the lack of empirical discriminant validity between awareness and intention indicates that local entrepreneurs perceive sustainability as a unified conceptual mandate. In conclusion, the transition toward a green economy in the IKN area is heavily dependent on bridging the "awareness-action gap" through focused psychological and operational readiness.

Based on these findings, several strategic policy interventions are proposed for the IKN

Authority, local governments, and MSME support institutions to bridge the gap between environmental consciousness and operational practice. First, authorities should transition from general sustainability campaigns toward "functional literacy" programs that provide targeted training on the specific ecological standards of the IKN Masterplan, helping entrepreneurs translate abstract concepts into concrete business knowledge. To capitalize on high levels of green intention, the government should implement incentive-based green certification or "Green-Label" initiatives, offering tax incentives, simplified licensing, or priority procurement to transform intent into measurable behavioral outcomes. Furthermore, the "awareness-action gap" can be mitigated by facilitating access to green resources, such as eco-friendly raw materials and sustainable technologies, ensuring that motivated entrepreneurs possess the practical means to adopt sustainable models. Finally, the development of digital sustainability platforms for knowledge sharing and mentorship would reinforce subjective norms within the regional business community, fostering a robust and self-sustaining culture of green entrepreneurship.

LIMITATION & FURTHER RESEARCH

This study is limited by its cross-sectional design and reliance on self-reported data, which may be subject to social desirability bias and inflated correlations. Future research should utilize longitudinal designs to observe the evolution of green behavior as the IKN development progresses through various stages. Additionally, integrating objective environmental performance metrics, such as verifiable carbon footprint data or waste-reduction audits, would provide a more robust validation of self-reported business behaviors and further clarify the distinction between entrepreneurial intention and actual environmental impact.

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