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Analyzing Pro-Environmental Planned Behavior in SMEs: Unveiling Green Innovation Intentions

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Abstract

The challenge of drastic global climate change has urged a transition to a green economy. The contribution of SMEs as an engine of macroeconomic expansion that pays attention to and makes environmental issues a basic concept of their business model is very important. This study aims to investigate the factors that influence the behavioral intention of SMEs in tourism areas in Labuan Bajo to conduct green innovation using an integrated approach of Pro environmental planned behavior (PEPB). Offline questionnaires and interviews were used as data collection tools, and 205 SMEs that have conducted green innovation were respondents. The theoretical model was tested using partial least squares structural equation modeling (PLS-SEM) with top-level constructs. The findings of this study reveal that perceived authority support, perceived environmental concern, subjective norm, attitude, significantly affect the intention of SMEs to do green innovation. Meanwhile, perceived behavioral control are known to be insignificant. These findings contribute to the development and validation of an integrated model of green innovation in SMEs and provide all business stakeholders with an understanding of the rationale for green innovation.

Introduction

Tourism, which plays a pivotal role in Indonesia's economy, currently confronts substantial challenges attributed to environmental issues (Arif, Behzad, Tahir, & Changxiao, 2022; Arif, Behzad, Tahir, & Li, 2022). Indonesia's Environmental Performance Index positions the nation at the 164th rank globally out of 180 and 22nd out of 25 in the Asia-Pacific region, underscoring environmental concerns within the tourism sector. Additionally, the Travel and Tourism Competitiveness Index (TTCI) evaluates Indonesia at the 131st position among 136 countries, highlighting the influence of small and medium-sized enterprises (SMEs) engaged in tourism-related businesses such as culinary, accommodation, transportation, and creative industries (World Economic Forum, 2022).

Studies conducted by the Economic Cooperation and Development Organization project that SMEs contribute 60%-70% to industrial pollution (Sinead Mitchell et al., 2020; Yavuz Agan et al., 2013). The Indonesia Waste Platform reports environmental challenges in Labuan Bajo, a prominent tourist destination, where SMEs generate 30 tons of environmental pollutants daily (Muslin, 2020). Addressing these challenges necessitates exploring the integration of environmental concepts with business operations through green innovation, which is critical for every industry (Dadhich & Hiran, 2022; J. Zhang et al., 2020).

Green innovation serves as a long-term environmentally oriented strategy to mitigate business-related pollution by introducing innovations in products and processes

(Jia et al., 2017). The implementation of green innovation in SMEs has proven effective in mitigating environmental impacts and enhancing overall performance (Huanyong Ji et al., 2023; Rustiarini et al., 2022; Singh et al., 2022). In tourism-focused SMEs, green innovation practices involve utilizing eco-friendly materials, adopting energy-efficient lighting and solar water heaters, sourcing organic food from local farmers, minimizing single-use items, and incorporating natural materials in creative product development or recycling processes.

Khanh Chi (2022), suggests that individual environmental concerns drive engagement in green innovation. Corporate environmental sustainability, influenced by social and economic factors, directly benefits from the economic advantages of adopting green innovation (Dadhich & Hiran, 2022). Other studies analyze the impact of technological factors on green innovation adoption in manufacturing sectors (Nguyen Minh Ha et al., 2022), stakeholder support for SMEs (Thomas et al., 2021), and factors influencing green innovation adoption in Pakistan (Jun et al., 2021) and Malaysia's automotive supply chain (Zailani et al., 2015). This suggests that past research trends focus on analyzing green innovation practices from the perspective of innovation characteristics and its benefits.

The novelty of this study, distinguishing it from previous research trends, lies in being the first to analyze green innovation practices from the perspective of planned behavior while integrating both internal and external environmental factors. The Pro Environmental Planned Behavior (PEPB) model, an extension of the Theory of Planned Behavior (TPB), encompasses perceived authority support and perceived environmental concern as additional measurement factors.

Assessing behavioral planning is crucial as it allows an understanding of the motivations, needs, and challenges faced by SMEs regarding green innovation practices, such as their motivations and obstacles. Understanding behavioral intention is also an initial step in determining the decision of SMEs to engage with green innovation. By comprehending this, policymakers can design strategies to align SMEs' motivations with sustainable development goals, including appropriate intervention strategies to change behavior. Additionally, the behavioral planning approach fosters awareness of the importance of green innovation practices and increased participation, for example, through authority support and social norms, ensuring that green innovation practices can be fully controlled by SMEs, thus supporting environmental sustainability. This approach involves psychological, social, and environmental factors influencing individual or group behavior. Assessing internal and external factors will help understand how SMEs interact with new technologies, organizational structures, and environmental factors, and how these factors influence organizational decisions in implementing green innovation. In this study, SMEs in the tourism sector are the focus.

The contributions of this research include, first, providing an integrated analytical framework that enhances the analysis of the intention to implement green innovation. Second, offering an in-depth understanding of the factors driving SMEs in the tourism sector to adopt green innovation, providing insights for policymakers and regulators in addressing environmental issues in the tourism sector. Third, the findings of this study offer practical relevance for SMEs in the tourism sector and provide guidance for designing more effective and sustainable green innovation strategies.

Review of Literature

Pro environmental Planned Behavior

Pro Environmental Planned Behavior (PEPB) is the development of a behavioral model proposed (Persada, 2016) from the basic framework of the Theory of Planned Behavior (TPB) (Ajzen, 1991) and is composed of six factors, namely perceived authority support (PAS), perceived environmental concern (PEC), and construct items adopted from the theory of planned behavior, namely attitude (ATT), subjective norm (SN), perceived behavioral control (PBC), and behavioral intention (BI). Persada's research adopted the factors mentioned above from previous studies (Ajzen, 1985; Chen & Tung, 2014; Nadlifatin et al., 2015; Persada et al., 2015).

Perceived authority support (PAS) refers to an individual or group's perception of government support as the highest decision-maker and is a relevant factor in influencing technical innovation through regulations, procedures, and policies that can encourage citizens to reduce the environmental impact of their business activities. (German et al., 2022; Nadlifatin et al., 2015, 2016a).

The pressure of environmental regulations that require business operations to pay attention to environmental aspects has become the most important external driver of pro-environmental business attitudes among hotel businesses in China (Peng et al., 2021). Resource support and facilities such as tax incentives from the government have driven the perception of the wine industry in Canada that this support is related to the general public's expectation that companies invest in non-polluting industries (Zhang et al., 2020). Other support, appreciation from the government, encourages the notion that people have control over their use of ecolabeled products (Mufidah et al., 2018; Nadlifatin et al., 2016b). This study will evaluate the attitude of SMEs in the tourism area, subjective norms, and perceived behavioral control through perceived authority support as a response to the implementation of green innovation.

H1 : PAS has a positive relationship to ATT

H2 : PAS has a positive relationship to SN

H3 : PAS has a positive relationship to PBC

Perceived environmental concern (PEC) is an individual's feelings about any physical activity that encourages the perception of individuals to behave responsibly about environmental conditions (Nadlifatin et al., 2016a; Persada et al., 2015). Studies show that most SMEs and entrepreneurs are willing to pay for energy and features that are less contrary to sustainability (Peng et al., 2021), although not all. Other evidence suggests that environmental concern can influence sustainable behavior either through attitude, subjective norm, or perceived behavioral control (Cai & Li, 2018; Nadlifatin et al., 2016b; Persada et al., 2015). Entrepreneurs who care about the environment can also influence the behavior of others by acting as important people who accept or reject green innovation. Entrepreneurs are increasingly concerned about the environment now that they realize the positive benefits of green innovation for the corporate environment (Mufidah et al., 2018). The same is considered in this study: the higher the level of concern of SMEs, the more it will encourage them to do green innovation.

H4 : PEC has a positive relationship to ATT

H5 : PEC has a positive relationship to SN

H6 : PEC has a positive relationship to PBC

Attitude (ATT) is a positive or negative response that a person gives to something given to him because of factors that have been learned (Aslam et al., 2017; Paramita et al., 2018). A subjective norm is an individual's perception of the expectations of people who are influential in their lives (significant others) regarding whether or not certain behaviors are carried out (Yoo & Fisher, 2017). Perceived behavioral control indicates that an individual will be confident enough to do something when they have control and a clear assessment of the ease or difficulty of certain activities (Fang & Zhang, 2021). Studies show that the intention to do pro-environment hotel business (Chen & Tung, 2014), and the use of electric vehicles for sustainability reasons (Shanmugavel & Balakrishnan, 2023) is influenced by positive attitudes towards environmental issues. Furthermore, the assumption that a person will consider the views and opinions of others to carry out pro-environmental activities is shown by research (Lu, 2019) on green purchasing decisions as well as in the study of electric transportation in China (Lee et al., 2023). Perceived behavioral control shows a positive relationship to a person's behavioral intention to carry out waste management programs (Galván-Mendoza et al., 2022), green shopping (Nadlifatin et al., 2016b), or recycling behavior (Chen Ming-Wi et al., 2022).

H7 : ATT has a positive relationship to BI

H8 : SN has a positive relationship to BI

H9 : PBC has a positive relationship to BI

Research Method

This research adopts a confirmatory research design employing quantitative analysis on primary data to examine the factors influencing the intention to engage in green innovation among Small and Medium Enterprises (SMEs) in the tourism sector based on the Pro Environmental Planned Behavior model. Sample collection utilized a non-probability sampling technique through the distribution of questionnaires to 205 SMEs in the Labuan Bajo tourism area actively involved in green innovation. In addition to completing the questionnaires, in-depth interviews were conducted with respondents to complement explanations in questionnaire responses, such as practical steps already taken or motivations behind SMEs engaging in green innovation.

The questionnaire was meticulously designed based on previous literature (Commer et al., 2017; Fang & Zhang, 2021; German et al., 2022a, 2022b; Lin et al., 2017; Lu, 2019b; Mufidah et al., 2018; Nadlifatin et al., 2016b; Persada et al., 2015; Shahzad et al., 2022; Singh et al., 2022; Thomas et al., 2021; Y. Zhang et al., 2020b) and modified to be more relevant to the target respondents. A five-point Likert scale (including (1) strongly disagree, (2) disagree, (3) neutral, (4) agree, (5) strongly agree) was employed for designing and developing the questionnaire.

Subsequently, data analysis was conducted using SmartPLS 4 software. Presentation of the analysis results includes descriptive analysis to determine respondent characteristics. Furthermore, an evaluation of the measurement model (outer model) was conducted to test the validity and reliability of each indicator. Next, the evaluation of the structural model (inner model) was conducted to test hypotheses using indicators such as path coefficient, t-statistic, P-value, and F2. A test is considered to have positive significance if it has a value ($p < 0.05$), and the F2 value indicates the magnitude of the influence of the path coefficient.

Result

Demographic Characteristic

The respondents consist of 205 small and medium-sized business owners, with 43% representing Creative Industry SMEs, 34% Culinary SMEs, and 23% Accommodation SMEs. Among these, 64% of SMEs have been in operation for 5-10 years, while 36% have operated for 2-4 years, and their business processes have entered a growth phase. Therefore, SMEs should pay more attention to green innovation in their production processes. Regarding the number of employees, 83% of SMEs have 4-10 employees, and 17% have 2-3 employees

Measurement Assessment

Table 1 presents the results of validity and reliability measurements, including Average Variance Extracted (AVE), Outer Loading, and Fornell-Larcker, to assess data accuracy for each construct. Each construct is considered valid when it meets the consecutive threshold criteria of >0.5 , >0.70 , <0.90 (Claes Fornell & David F Larcker, 1981; Hair et al., 2019). Additionally, reliability measurements, evaluated through Cronbach's alpha and composite reliability values >0.70 , are used to determine the internal consistency of each construct (Henseler et al., 2015). Table 1 indicates that all constructs have met the threshold criteria, thus being deemed valid and reliable.

Table 1. Measurement Assessment

Variable	Items	Outer loading	AVE	Fornell Larcker	Cronbach's Alpha	Composite Reliability
PAS	PAS 1	0,71				
	PAS 2	0,769				
	PAS 3	0,837	0,631	0,794	0,855	0,880
	PAS 4	0,82				
	PAS 5	0,827				
PEC	PEC 1	0,866				
	PEC 2	0,816	0,736	0,858	0,825	0,856
	PEC 3	0,891				
ATT	ATT 1	0,73				
	ATT 2	0,853	0,618	0,786	0,698	0,719
	ATT 3	0,77				
SN	SN 1	0,847				
	SN 2	0,783	0,703	0,839	0,795	0,839
	SN 3	0,883				
PBC	PBC 1	0,841				
	PBC 2	0,814				
	PBC 3	0,778	0,658	0,811	0,742	0,754
	CP 2	0,882				
	CP 3	0,877				
BI	BI 1	0,878				
	BI 2	0,889	0,742	0,862	0,827	0,840
	BI 3	0,816				

Source: Output SmartPLS4 (2023)

Note: PAS (Perceived authority Support), PEC (Perceived Environmental Concern), ATT (Attitude), SN (Subjective Norm), PBC (Perceived behavioral control), COM (Compatibility), RA (Relative Advantages), QHR (Quality of Human Resources), EP (External Partnership), EU (Environmental Uncertainty), CP (Competitor Pressure)

R-Square Assessment

After conducting hypothesis testing, an evaluation of the feasibility of the research model was performed. In this study, the R2 value for green innovation is 0.76 (Table 2). Consequently, this model effectively explains a significant portion of the variation in green innovation, accounting for 76%.

Table 2. R-Square Assessment

Variable	R-square
Attitude	0,425
Subjective Norm	0,418
Perceived Behavioral Control	0,214
Behavioral Intention	0,76

Source : Output SmartPLS 4.0 (2023)

Structural Assessment

Table 3 displays the structural parameters of the hypothesized variable relationships. From the Pro Environmental Planned Behavior model, it is evident that the variable "perceived authority support" has a significant positive relationship with "attitude" ($p < .05$), "subjective norm" ($p < .05$), and "perceived behavioral control" ($p < .05$). The variable "perceived environmental concern" exhibits a significant positive relationship with "attitude" ($p < .05$) and "subjective norm" ($p < .05$), but it is not significant for the variable "perceived behavioral control" ($p < .05$).

Furthermore, the variable "behavioral intention" is significantly positively influenced by the variable "attitude" ($p < .05$) and "subjective norm," but it is not significant for the variable "perceived behavioral control" ($p < .05$). This implies that H1, H2, H3, H4, H5, H7, and H8 are accepted, while H6 and H9 are rejected.

Table 3. Structural Assessment

Hypotheses	Variable	Path Coefficient	t-statistic	P-Value	F ²	Decision
H1	PAS → ATT	0,355	5,892	0,000	0,07	Accepted
H2	PAS → SN	0,261	4,479	0,000	0,03	Accepted
H3	PAS → PBC	0,363	6,966	0,000	0,07	Accepted
H4	PEC → ATT	0,147	2,550	0,011	0,02	Accepted
H5	PEC → SN	0,238	3,236	0,001	0,03	Accepted
H6	PEC → PBC	0,122	1,822	0,068	0,00	Rejected
H7	ATT → BI	0,138	2,601	0,009	0,02	Accepted
H8	SN → BI	0,152	2,053	0,040	0,02	Accepted
H9	PBC → BI	0,064	1,258	0,209	0,00	Rejected

Source: Output SmartPLS4 (2023)

Note: PAS (Perceived authority Support), PEC (Perceived Environmental Concern), ATT (Attitude), SN (Subjective Norm), PBC (Perceived behavioral control), COM (Compatibility), RA (Relative Advantages), QHR (Quality of Human Resources), EP (External Partnership), EU (Environmental Uncertainty), CP (Competitor Pressure)

Discussion

Statistical analysis results reveal that the Perceived Authority Support (PAS) variable has a significant positive influence on attitude ($\beta = 0.355, p < .05$). This outcome aligns with previous studies conducted by (Liao and Tsia, 2019; Perri et al., 2020; and Wasiq et al., 2022). In Labuan Bajo, the legal and regulatory support, exemplified by regulations mandating environmentally friendly practices for SMEs, has a direct impact on operational cost efficiency. The government's initiatives, such as waste processing facilities, tax incentives, and educational programs, foster a positive attitude and encourage SMEs to embrace green innovation.

The statistical analysis of the Perceived Authority Support (PAS) variable has a significant positive influence on subjective norm ($\beta = 0.261, p < .05$). This finding is consistent with research (Lin et al., 2017; Persada et al., 2018; and Nadlifatin et al., 2018). In Labuan Bajo, SMEs perceive the government's support and legitimacy as influential in shaping subjective norms. Government programs, such as low-interest loans and educational campaigns, contribute to a strong subjective norm supporting environmentally friendly practices among SMEs in the tourism sector.

The Perceived Authority Support (PAS) variable has significantly influences perceived behavioral control ($\beta = 0.363, p < .05$), supporting earlier studies (Puspita, 2017; Nadlifatin et al., 2018; and Sawitri et al, 2016). The environmental certification program for creative industry businesses in Labuan Bajo exemplifies government support, providing a sense of control to SMEs over their sustainable initiatives. Certification and recognition by the government contribute to SMEs feeling empowered and motivated to engage in green innovation.

The statistical analysis of the Perceived Environmental Concern (PEC) variable shows a significant positive influence on attitude ($\beta = 0.147, p < .05$). This finding aligns with research by (Lin et al., 2017; Persada et al., 2018; and Wang et al., 2020). Perceived environmental concern plays a pivotal role in influencing the attitude of SMEs in Labuan Bajo, reflecting their care and responsibility towards environmental issues. Strong perceived environmental concern is evident in SMEs' commitment to using recycled materials and reducing plastic waste.

Results indicate that the Perceived Environmental Concern (PEC) variable has a significant positive influence on subjective norm ($\beta = 0.238, p < .05$). This result is in line with studies (Lin et al., 2017; Persada et al., 2018; and Nadlifatin et al., 2018). Perceived environmental concern among SMEs in Labuan Bajo contributes to their subjective norms, fostering a sense of social responsibility and the belief that green innovation practices should be the norm in the tourism industry.

However, the Perceived Environmental Concern (PEC) variable ($\beta = 0.122, p > .05$) does not significantly influence perceived behavioral control. The limited capabilities of SMEs in Labuan Bajo to choose environmentally friendly business practices indicate a lack of awareness and education among business owners.

Statistical analysis results for the Attitude (ATT) variable show a significant positive influence on behavioral intention ($\beta = 0.138, p < .05$). This aligns with research by (Yuriev et al., 2020; Lucarelli et al., 2020; Tian et al., 2020; and Nadlifatin et al., 2018). A positive attitude serves as motivation for SMEs to view green innovation as enjoyable and beneficial, leading to a strong intention to implement green practices.

Results for the Subjective Norm (SN) variable show a significant positive influence on behavioral intention ($\beta = 0.152, p < .05$). This result aligns with research by (Akram et al., 2023; Lu et al., 2021; Yuriev et al., 2020; Lin et al., 2017; and Palupi et al., 2017). The

perceived influence of close parties significantly affects SMEs' intentions to engage in green innovation, reflecting the impact of societal expectations on SMEs.

However, the Perceived Behavioral Control (PBC) variable does not significantly influence behavioral intention ($\beta = 0.064$, $p > .05$). This result is consistent with previous research by (Ayudya & Wibowo 2018; Annilda, 2017; and Donald et al., 2014). Limited knowledge and skills among business owners hinder the significant impact of perceived behavioral control on behavioral intention.

The research findings hold pertinent managerial implications for various stakeholders. For tourism SMEs in Labuan Bajo, it is crucial to prioritize customer satisfaction and operational efficiency through the implementation of green innovation. By embracing sustainable practices, SMEs can enhance competitiveness and appeal to environmentally conscious consumers, fostering long-term business viability. Governments can play a pivotal role by providing support, incentives, and stringent environmental regulations to promote sustainable business practices. Additionally, governmental involvement in increasing public awareness of environmental issues is essential. Other environmentally conscious stakeholders can offer financial support to SMEs committed to eco-friendly innovations, considering the initial investment required. Collaboration among all parties is imperative to create an ecosystem supporting environmental sustainability in Labuan Bajo. However, it's important to note a limitation of the study – the research was conducted in only four tourist destinations in Labuan Bajo. Therefore, future studies are recommended to broaden the scope of observational areas, providing a more comprehensive understanding of factors influencing green innovation adoption across a wider range of locations.

Conclusion

Based on the conducted research, it is evident that perceived authority support has a significant positive correlation with attitude, subjective norm, and perceived behavioral control in implementing green innovation. This implies that higher government support, whether through regulations or policies, leads to the formation of more positive attitudes, subjective norms, and personal control among SMEs in the tourism sector regarding green innovation.

Furthermore, the findings indicate that perceived environmental concern has a significant positive relationship with attitude and subjective norm. This suggests that a heightened awareness of environmental issues stimulates the development of positive attitudes and subjective norms toward the adoption of green innovation. Additionally, there is a significant positive relationship between attitude and subjective norm concerning behavioral intention, while there is no influence between perceived behavioral control and behavioral intention.

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