Global Explorations in Economics and Management
Volume 1, Number 1, 2026
P-ISSN: xxxx-xxxx E-ISSN : xxxx-xxxx
Open Access: https://eksploratif.com/geem

The Influence Of Green Leadership And Green Culture On Pro-Environmental Behavior And Sustainable Performance

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Article Info

Article history:
Received January 12th, 2026
Revised February 20th, 2026
Accepted April 26th, 2026

Keyword:
Green Transformational Leadership; Green Culture; Pro-Environmental Behavior; Sustainable Performance

ABSTRACT

This study aims to analyze the influence of green transformational leadership and green culture on pro-environmental behavior and its implications on sustainable performance in Micro, Small, and Medium Enterprises (SMEs) in the livestock sector in Margokaton Village. The research uses a quantitative approach with a survey method. Primary data was collected through a Likert 1-5 scale questionnaire which was distributed to all MSME employees in the livestock sector as many as 151 respondents, so this study used census techniques. The variables studied included green transformational leadership, green culture, pro-environmental behavior, and sustainable performance. Data analysis was conducted using AMOS-based Structural Equation Modeling (SEM) to examine the direct and indirect relationships between variables and the mediating role of pro-environmental behavior. The results of the study show that green transformational leadership has a positive and significant effect on pro-environmental behavior, green culture also has a positive and significant effect on pro-environmental behavior, and pro-environmental behavior has a positive and significant effect on the sustainable performance of SMEs in the livestock sector. These findings indicate that pro-environmental behavior plays a strategic role as a mechanism that links green leadership practices and culture with the achievement of sustainable performance that includes economic, social, and environmental aspects.

BACKGROUND

In recent years, sustainability issues have evolved from a mere global discourse to a strategic need in various sectors, including Micro, Small, and Medium Enterprises (SMEs). The concept of sustainable development emphasizes a balance between economic, social, and environmental aspects (Kazancoglu et al., 2023). In Indonesia, SMEs have a significant contribution to the national economy through job creation and local economic drivers. However, production activities, especially in the livestock sector, often cause environmental problems such as waste, emissions, inefficient energy use, and less controlled use of chemicals (Shandilya et al., 2024). This condition requires SMEs to integrate sustainability principles in their operations to remain competitive and ecologically responsible.

In the livestock sector in Margokaton Village, Seyegan, various environmental problems such as suboptimal waste management, low energy efficiency, and lack of awareness of environmentally friendly practices are still found. This situation shows that sustainability has not been systematically integrated in business management. In fact, the increasing consumer preference for hygienic and sustainable products requires business actors to adapt to higher environmental standards (Sari, 2024).

The main problem lies in the lack of optimal integration of green leadership and green culture in daily business activities. Green Transformational Leadership (GTL) plays a role in inspiring and encouraging employees to adopt eco-friendly practices through vision,

exemplary, and strategic support (Sari, 2024). Meanwhile, green culture reflects the values and norms of the organization that support collective environmentally-caring behaviors (Chiou & Cheng, 2013). Without strong leadership and cultural support, employees struggle to develop consistently.

Pro-environmental behavior is a key factor in realizing sustainable performance, as it includes tangible actions such as energy conservation, proper waste management, as well as participation in environmental conservation initiatives (Robertson & Barling, 2013). However, previous research has highlighted more of the direct link between green leadership and sustainable performance, while mediation mechanisms through individual behavior are still limited, particularly in the context of SMEs in developing countries (Wang et al., 2024).

Theoretically, this research is based on the Theory of Planned Behavior (TPB) developed by (Ajzen, 1991). TPB explains that individual behavior is influenced by intentions formed from attitudes, subjective norms, and perceptions of behavior control. In an organizational context, green leadership and green culture can shape subjective norms and increase the perception of employee behavioral control over pro-environmental actions. Thus, PEB acts as a psychological mechanism that bridges the influence of organizational factors on sustainable performance.

The novelty of this research lies in the integration of pro-environmental behavior as a mediating variable in the relationship between green transformational leadership, green culture, and sustainable performance in SMEs in the livestock sector. This approach is expected to enrich the sustainability literature while providing practical implications for the development of managerial strategies that support the achievement of sustainable performance comprehensively.

LITERATURE REVIEW

Theory of Planned Behavior (TPB)

Theory of Planned Behavior (TPB) is a psychological theory developed by Icek Ajzen in 1985 as a development of the theory of Reasoned Action. This theory explains how attitudes, social norms, and perceptions of an individual's control over a behavior can affect their intention to act (Ajzen, 1991). This theory focuses on the influence of internal and external factors that shape an individual's decisions, which then drives their actions. The Theory of Planned Behavior (TPB) is often used in fields such as marketing, health, management, and the environment to understand and predict human behavior. This theory is particularly relevant in the context of decision-making because it considers many factors that influence individuals in acting, such as personal evaluation, social pressure, and perceptions of the control they have over those behaviors.

Green Transformational Leadership

A sustainability-oriented leadership approach with the goal of inspiring, motivating, and directing employees to adopt environmentally friendly practices in the workplace (You et al., 2023). In the context of modern business, sustainability is a crucial aspect that has an impact not only on the environment but also on the competitiveness and sustainability of the organization in the long term (Bordignon et al., 2024).

Leaders who implement GTL act as agents of change that encourage organizations to transition towards a more environmentally friendly direction by instilling sustainability values in work culture (Lee et al., 2023). This leadership emphasizes the importance of ecological awareness in every strategic decision of the organization and encourages individual and collective behavior change towards more sustainable practices (Kumar et al., 2024).

GTL includes four main dimensions: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Ren et al., 2024). In the context of

the environment, leaders with ideal influence act as role models who demonstrate a commitment to sustainability through tangible actions, such as reducing waste, using resources efficiently, and implementing green technologies (Yan et al., 2024). Inspirational motivation in GTL plays a role in building a sustainability-based organizational vision as well as encouraging employees to feel involved in a larger environmental mission (Kaya & Atsan, 2025).

Green Culture

Green Culture is a set of values, norms, beliefs, and practices that are applied in an organization to instill awareness and responsibility for the environment in every aspect of its operations (Gazi et al., 2024). This concept aims to ensure that all members of the organization, starting from management This concept aims to ensure that all members of the organization, starting from management (Bordignon et al., 2024). Green culture is not related to formal policies implemented in organizations, but also includes collective mindsets and behaviors that reflect concern for the environment. Organizations that have a green culture will be more likely to apply sustainability principles in decision-making, from business strategy planning to the implementation of day-to-day operations (Juliana et al., 2025). Therefore, green culture plays an important role in creating a work environment conducive to the development of environmentally friendly practices consistently and sustainably.

One of the main indicators of the success of a green culture in an organization is the existence of policies and systems that support environmentally responsible business practices (Randazzo et al., 2024). This includes various aspects, such as efficient resource management, waste reduction, application of circular economy principles, and the use of renewable energy (Iacobucci & Perugini, 2023). Organizations that have a green culture will actively adopt environmentally friendly technologies, as well as implement more sustainable operational standards. In addition, green culture is also reflected in the company's internal policies that encourage employees to adopt a more environmentally friendly lifestyle, for example by providing recycling facilities in the office, reducing the use of single-use plastics, and providing incentives for employees who use environmentally friendly transportation such as bicycles or electric vehicles (Garrod et al., 2023). With supportive policies, organizations can create a work environment that motivates all members to take an active role in green initiatives.

Green culture can be categorized into three main levels, namely green artifacts, green values, and green assumptions (M. Imran, I. Arshad, 2021). Green artifacts refer to concrete policies, procedures, and practices implemented within organizations to support sustainability, such as the implementation of environmental management systems and Corporate Social Responsibility (CSR) programs that focus on the protection of nature (Song et al., 2024). Green values reflect the organization's beliefs about the importance of green practices and their impact on business continuity. This value is generally reflected in the company's vision, mission, and code of ethics that prioritize sustainability as part of the work culture (Yang et al., 2023). Meanwhile, green assumptions refer to the fundamental understanding that sustainability is not just an option, but an essential necessity that must be integrated into all aspects of organizational operations (Moktadir & Ren, 2024).

Pro-Environmental Behavior

Pro-Environmental Behavior is a series of individual actions that voluntarily aim to reduce negative impacts on the environment and contribute to the sustainability of ecosystems (Jit et al., 2023). Behaviors include a variety of activities, such as saving energy, recycling, reducing plastic use, using environmentally friendly transportation, as well as participating in conservation programs (Lowe et al., 2024). This behavior is becoming increasingly important in the face of the challenges of climate change and environmental degradation that continue to

increase (Polzin, 2024). An individual's awareness of implementing pro-environmental behavior can arise from a variety of factors, including education, social norms, as well as first-hand experience of the negative impact of human activities on the environment (Nur et al., 2023).

These behaviors are driven by three main factors: attitudes toward the environment of subjective norms and perceptions of behavioral control (Ajzen, 1991). Attitudes towards the environment reflect the extent to which individuals have beliefs that their actions can have a positive impact on the environment (Murphy & Halpenny, 2025). Subjective norms refer to the social influences and expectations of those around them that encourage individuals to act more environmentally friendly (Shahzabeen et al., 2023). Meanwhile, the perception of behavioral control relates to the extent to which individuals feel capable of implementing pro-environmental behaviors in daily life (Hao et al., 2024; Kromand et al., 2025). These three factors are interrelated and influence individual decisions in behaving environmentally friendly (Granato & Hende, 2026).

Continuous Performance

Sustainable Performance is an organization's achievement in economic, social, and environmental aspects that aims to ensure long-term business continuity without compromising the balance of the ecosystem (Nogueira et al., 2025). This concept is a sustainable framework that emphasizes that an organization's success is not only measured by financial gains, but also its impact on society and the environment (Nogueira et al., 2024). In a business context, sustainable performance includes operational efficiency, environmentally friendly product innovation, employee welfare, compliance with environmental regulations, and contribution to social development (Halawa et al., 2025).

Companies that implement sustainability strategies tend to have a competitive advantage because they are able to better manage environmental risks, improve reputation, and attract more investors who care about Environmental, Social, and Governance aspects (Abbas, 2026; Aslam et al., 2024). Thus, green transformational leadership and green culture can play a role in creating pro-environmental behaviors that drive the achievement of sustainable performance within the organization (Ngoc Huynh et al., 2024)(Ledi et al., 2024). In addition, sustainable performance also contributes to increasing the company's competitiveness in the long term (Abbas, 2026). Companies that adopt sustainability principles are often more innovative in developing environmentally friendly products and services, which can ultimately increase customer loyalty and expand market share (Al-Romeedy & El-Sisi, 2024). Modern consumers are increasingly aware of the environmental impact of the products they use, so organizations that implement environmentally responsible business practices will be more appreciated by the market.

The implementation of sustainable performance also involves more efficient management of resources. The use of renewable energy, optimization of a more environmentally friendly supply chain, and the implementation of a circular business model are some of the steps that can be taken to support the sustainability of the company's operations (Shayo et al., 2025). With this strategy, companies can reduce operational costs in the long run while reducing negative impacts on the environment.

HYPOTHESIS

The Influence of Green Transformational Leadership on Pro-Environmental Behavior

Green Transformational Leadership is sustainability-oriented and seeks to inspire and motivate employees in implementing environmentally friendly practices (Hadi, 2026; Haider et al., 2026). Leaders who implement green transformational leadership tend to encourage employees to behave pro-environment by setting an example, building a shared vision of sustainability, and providing moral and material support for the implementation of green actions in the workplace (Hadi, 2026). Therefore, this study hypothesizes that green transformational leadership has a positive effect on employees' pro-environmental behavior.

H1: There Is an Influence of Green Transformational Leadership on Pro-Environmental Behavior

The Influence of Green Culture on Pro-Environmental Behavior

A green culture in an organization reflects a collective commitment to sustainable practices that are integrated into the company's values, norms, and policies (Belayneh & Singh, 2026; Parvez et al., 2026). A strong green culture will create a supportive work environment as well as facilitate individuals to behave environmentally friendly in their daily activities (Raczkiewicz et al., 2024). With a green culture embedded in the organization, employees will be more motivated to participate in various environmental initiatives, such as energy efficiency, waste management, and sustainability-based innovation (Sun et al., 2024). Based on this, this study proposes a hypothesis that green culture has a positive effect on the pro-environmental behavior of employees.

H2: There is an Influence of Green Culture on Pro-Environmental Behavior

Pro-Environmental Behavior Towards Sustainable Performance

Employees' pro-environmental behavior is one of the key factors in supporting the achievement of sustainable performance in the organization (Rainanto, 2023). When employees are actively involved in environmentally friendly actions, such as reducing resource consumption, recycling, and implementing green innovations, the organization will benefit economically, socially, and environmentally (Li & Li, 2025). Consistent pro-environmental behavior in the workplace contributes to operational efficiency, reduction of negative environmental impacts, and improved company reputation in the eyes of stakeholders (Liu et al., 2023). Therefore, this study proposes the hypothesis that employees' pro-environmental behavior has a positive effect on the achievement of sustainable organizational performance.

H3: There is a Pro-Environmental Influence on Sustainable Performance

RESEARCH METHODOLOGY

This study uses a quantitative approach with a survey method to examine the influence of Green Transformational Leadership and Green Culture on Pro-Environmental Behavior and its impact on Sustainable Performance on MSME employees in the livestock sector in Margokaton Village. Primary data were obtained through a Likert scale questionnaire 1–5 which was distributed to the entire population of 151 employees (census). The number of samples has met the criteria for AMOS-based Structural Equation Modeling (SEM) analysis (Hair et al., 2022). The research variables include Green Transformational Leadership (ideal influence, inspirational motivation, intellectual stimulation, and environment-based individual considerations), Green Culture, Pro-Environmental Behavior (environmental OCB, green work behavior, and voluntary initiatives), and Sustainable Performance (economic, social, and environmental performance). Before the main analysis, a test of the validity and reliability of the instrument was carried out. Data analysis included descriptive analysis to describe

respondent characteristics and answer distribution, as well as inferential analysis using SEM-AMOS.

ANALYSIS AND DISCUSSION

Sample Distribution Data of MSME Employees in the Livestock Sector

This research involves employees who work in several SMEs in the livestock sector as a research sample. The sample determination was carried out by considering the number of employees in each MSME in order to be able to represent the condition of the workforce in the livestock sector proportionally. The distribution of employee samples based on livestock SMEs that are the object of the research is presented in Table 1 below.

Table 1: Distribution of SME Employees in the Livestock Sector

Yes	Name of Animal Husbandry SMEs	Number of Employees (People)
1	SMEs Beef Cattle Makmur Jaya	18
2	SMEs Prosperous Chicken Farm	15
3	SMEs Raise Goat Livestock Margo Lestari	14
4	Laying Hen SMEs A Source of Fortune	16
5	SMEs Cattle Cattle Barokah	17
6	SMEs Margokaton Duck Farm	13
7	SMEs Agro Mandiri Goat Livestock	12
8	SMEs Independent Chicken Farm	15
9	SMEs Beef Cattle Progress Smoothly	16
10	Margokaton Integrated Livestock SMEs	15
Total		**151**

Based on Table 1, it can be seen that the total number of employees involved in this study is 151 people spread across 10 SMEs in the livestock sector. The number of employees in each MSME varies, with the highest number being 18 people in Makmur Jaya Cattle SMEs, while the lowest number is in Agro Mandiri Goat Livestock SMEs as many as 12 people. This variation in the number of employees shows differences in the scale of business in each MSME, but overall all samples have reflected the characteristics of the workforce in the livestock sector that is the focus of the research.

Respondent Characteristics

The characteristics of the respondents show a fairly balanced demographic variation in aspects of gender, age, and education, so that it can support a more representative analysis of the group studied. This distribution is also important to look at potential differences in responses based on demographic background. Details of respondent characteristics are presented in Table 2 below.

Table 2: Characteristics of Respondents

Demographic Categories	Remarks	Frequency	Percent (%)
Gender	Male	83	55.0
	Women	68	45.0
	Total	**151**	**100.0**

Demographic Categories	Remarks	Frequency	Percent (%)
Age	< 26 (Generation Z)	29	19.2
	27–42 (Generation Y)	41	27.2
	43–58 (Generation X)	54	35.8
	> 59	27	17.9
	Total	**151**	**100.0**
Education	High School/Equivalent	99	65.6
	S1	49	32.5
	S2	3	2.0
	Total	**151**	**100.0**

Based on gender, the majority of respondents in this study were men as many as 83 people or 55%, while female respondents amounted to 68 people or 45% of the total respondents. This shows that the participation of men is slightly higher than that of women in this survey.

In terms of age, the most respondents came from the age group of 43-58 years (generation X) with a total of 54 people or 35.8%. Furthermore, the age group of 27–42 years (generation Y) amounted to 41 people (27.2%), followed by the age group under 26 years old (generation Z) as many as 29 people (19.2%). Meanwhile, respondents over 59 years old were recorded as many as 27 people (17.9%). This composition shows that most of the respondents are productive age individuals.

Judging from the last level of education, most of the respondents have a high school education background or equivalent, which is as many as 99 people or 65.6% of the total respondents. A total of 49 people (32.5%) have studied up to the S1 level, while 3 people (2.0%) have reached the S2 education level. This reflects that the majority of respondents have a secondary level of education.

The demographic profile of the respondents in this study shows the dominance of men of productive age with a secondary education background. This information is important as a basis for understanding the characteristics of the population that is the object of study and in formulating relevant intervention strategies according to these characteristics.

Validity and Reliability

Data quality testing is a crucial process in research methodology, as it will determine the quality of accurate and reliable data analysis results. The importance of this test lies in its ability to ensure the integrity and reliability of the data used in the research. In Table 1, the results of validity and reliability tests are presented to validate and measure the reliability of the data that has been collected:

Table 3: Validity and Reliability of Research Instruments

Variable	Indicator	Correlation	Cronbach's Alpha	Remarks
Green Transformational Leadership	KTH1	0.499	0.856	Valid and Reliable
	KTH2	0.856		Valid
	KTH3	0.822		Valid
	KTH4	0.834		Valid

Variable	Indicator	Correlation	Cronbach's Alpha	Remarks
	KTH5	0.809		Valid
	KTH6	0.797		Valid
Green Culture	BH1	0.648	0.921	Valid and Reliable
	BH2	0.655		Valid
	BH3	0.837		Valid
	BH4	0.824		Valid
	BH5	0.866		Valid
	BH6	0.820		Valid
Pro-Environmental Behavior	PPL1	0.797	0.920	Valid and Reliable
	PPL2	0.779		Valid
	PPL3	0.762		Valid
	PPL4	0.842		Valid
	PPL5	0.790		Valid
	PPL6	0.666		Valid
Continuous Performance	KB1	0.808	0.883	Valid and Reliable
	KB2	0.777		Valid
	KB3	0.836		Valid
	KB4	0.824		Valid
	KB5	0.772		Valid
	KB6	0.141		**Invalid**

The validity and reliability test is an important step in ensuring that the research instrument is able to measure the construct in question accurately and consistently. The validity of the instrument was tested through itemtotal correlation, while reliability was measured using Cronbach's alpha coefficient. According to (Sugiyono, 2019), an item is said to be valid if the item-total correlation value (r-calculate) ≥ 0.30. Meanwhile, (Nunnally, J. C., & Bernstein, 1994) states that a ≥ Cronbach'salpha value of 0.70 indicates acceptable reliability for exploratory research, and a value of ≥ 0.80 is recommended for applied research.

The results of the validity and reliability test in Table 4.2 show that most of the items in the four study variables have an item-total correlation value above 0.30, which means that it is valid. Cronbach's alpha values for each variable were also above 0.80, indicating that the instrument had good internal consistency. However, there is one item in the Continuous Performance (KB6) variable that has an item-total correlation value of 0.141, which is below the threshold, so the item is considered invalid and should be considered for exclusion from further analysis.

Descriptive Statistics of Variables

The following is presented descriptive data that includes the minimum, maximum, mean, and standard deviation values for each variable studied. These descriptive statistics aim to provide an overview of the distribution of data, central trends, and the degree of variation or

spread of respondent scores for each indicator. This information is important as a basis for understanding the characteristics of the data before further inferential analysis is carried out. Here I tidy up and put them together into one consistent table, assuming N = 151 respondents, a Likert scale **of 1–5**, and a standard format of descriptive statistics per indicator (ready for Chapter IV):

Table 4: Descriptive Statistics of Research Variables

Variable	Indicator	N	Min	Max	Red	Std. Dev
Green Transformational Leadership	KTH1	151	1	5	3.45	0.922
	KTH2	151	1	5	3.44	0.928
	KTH3	151	1	5	3.35	0.881
	KTH4	151	1	5	3.34	0.871
	KTH5	151	1	5	3.38	0.855
	KTH6	151	1	5	3.36	0.867
Green Culture	BH1	151	1	5	3.38	0.855
	BH2	151	1	5	3.41	0.904
	BH3	151	1	5	3.48	0.937
	BH4	151	1	5	3.46	0.922
	BH5	151	1	5	3.50	0.944
	BH6	151	1	5	3.44	0.957
Pro-Environmental Behavior	PPL1	151	1	5	3.32	0.912
	PPL2	151	1	5	3.35	0.888
	PPL3	151	1	5	3.38	0.915
	PPL4	151	1	5	3.46	0.854
	PPL5	151	1	5	3.43	0.868
	PPL6	151	1	5	3.36	0.870
Continuous Performance	KB1	151	1	5	3.34	0.825
	KB2	151	1	5	3.30	0.825
	KB3	151	1	5	3.34	0.832
	KB4	151	1	5	3.36	0.835
	KB5	151	1	5	3.42	0.982
	KB6	151	3	5	4.29	0.617

Valid N (listwise) = 151

Descriptive statistics were used to describe the data characteristics of each indicator on the variables Green Transformational Leadership, Green Culture, Pro-Environmental Behavior, and Sustainable Performance based on 151 respondents (N = 151), with minimum, maximum, mean, and standard deviation parameters. In the Green Transformational Leadership variable, all indicators (KTH1–KTH6) had a range of 1–5 with a mean of 3.34–3.45 and a standard deviation of 0.855–0.928, showing a fairly positive perception with moderate variation. Green culture has a mean of 3.38–3.50 and a standard deviation of 0.855–0.957, reflecting a relatively good but varied perception. The Pro-Environment behavior showed a mean of 3.32–3.46 and a standard deviation of 0.854–0.915, with a relatively homogeneous distribution of data.

In Continuous Performance, the KB1–KB5 indicator has a mean of 3.30–3.42 and a standard deviation of 0.825–0.982. Meanwhile, KB6 had the highest mean (4.29), lower

standard deviation (0.617), and a minimum value of 3, which indicates a very high and more uniform perception. In general, descriptive data show a tendency to positive perception of all variables, as a basis for subsequent inferential analysis.

INFERENTIAL ANALYSIS

After all research instruments are declared valid and reliable through validity and reliability tests, the next step is to analyze inferential data to confirm the causal relationship that has been formulated in the research hypothesis. This process aims to empirically test the extent to which independent variables affect dependent variables, either directly or through mediation or moderation variables. This analysis is carried out using advanced statistical approaches, such as Structural Equation Modeling (SEM), which is able to test the relationships between variables simultaneously and provide more accurate parameter estimates. Thus, this analysis is a crucial part in testing the correctness of the proposed theoretical model as well as in answering research questions comprehensively and data-based.

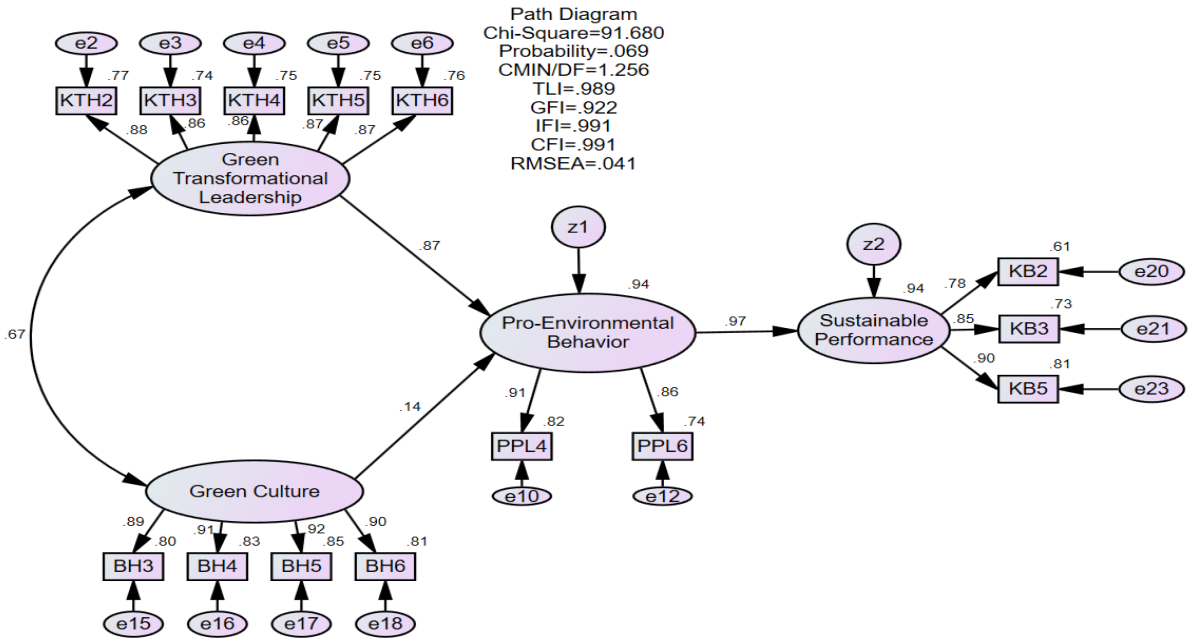

Figure 4. 1: Path Diagram Structural Equation Modeling (SEM)

Loading Factor

Based on the results of the analysis of the Structural Equation Modeling (SEM) model using AMOS, a loading factor value was obtained that reflects the strength of the relationship between each indicator and the latent construct it measured. In the Green Transformational Leadership variable, the indicators used showed a fairly good contribution, with loading factor values ranging from 0.75 to 0.87. The KTH6 indicator has the highest value of 0.87, indicating that it is the most powerful indicator presenting the construct. Although the values for KTH4 and KTH5 are slightly below 0.80, they are still statistically acceptable in the measurement model.

For the Green Culture variable, all indicators have a very high loading factor value, which is between 0.81 and 0.90. The highest score was obtained by the BH6 indicator (0.90), indicating that all these indicators are able to explain the construct of Green Culture consistently and strongly. This shows good convergent validity, as recommended in SEM analysis.

Meanwhile, in the Pro-Environmental Behavior construct, the two main indicators, namely PPL4 and PPL6, showed loading values of 0.94 and 0.74, respectively. A value of 0.94 on PPL4 indicates a very high contribution in explaining proenvironmental behavior, while PPL6 is also quite representative although the value is slightly lower. The Sustainable Performance construct

is formed by three indicators, namely KB2, KB3, and KB5, with loading factor values of 0.78, 0.73, and 0.90, respectively. This shows that the KB5 indicator makes the most dominant contribution to the sustainable performance construct, while the other two indicators remain in the good category as their loading values are above the minimum recommended threshold, which is 0.70.

Broadly speaking, the loading factor values obtained in all constructs show that the indicators used in this study are valid in representing the latent constructs studied. The validity of the convergent is met and the measurement model can be said to be adequate for further analysis. In addition, the Average Variance Extracted (AVE) value of each construct has also met the minimum threshold of 0.5, which indicates that the proportion of variance of the indicator successfully explained by the construct is quite high. Thus, the instrument used in this study can be said to have reliability and accuracy in measuring the concept in question.

Goodness of Fit

Based on results Structural Equation Modeling (SEM) analysis with AMOS, the research model shows an excellent degree of conformity to empirical data. This is shown by the Chi-Square value of 91,680 with a probability of 0.069 which is above the 0.05 threshold, indicating that there is no significant difference between the model and the data. The CMIN/DF ratio of 1.256 is also within the ideal range (1–3), which indicates that the model is a good fit. In addition, several other suitability indices such as TLI of 0.989, GFI of 0.922, IFI of 0.991, and CFI of 0.991, all of which exceed the threshold value of 0.90 which is generally used as an excellent fit indicator. No less important, the RMSEA value of 0.041 also indicates an excellent fit as it is below the maximum limit of 0.08, even close to the ideal value below 0.05. Thus, overall, this model can be said to be very appropriate and feasible to test the relationships between variables proposed in the research hypothesis (Joseph F. Hair, G. T. Hult Christian M, Ringle Christian M, 2013).

RESULTS

After analysis using Structural Equation Modeling (SEM) with the help of AMOS software, all model evaluation criteria, both at the measurement stage and at the structural stage, have been met. This is shown by the goodness of fit values that are within the suggested limits as well as the validity and reliability of the construct that have been confirmed through the loading factor, Average Variance Extracted (AVE), and Composite Reliability (CR) indicators. With the fulfillment of all the assumptions and feasibility of the model, the output of the parameter estimation contained in the estimates section can be used as a valid and reliable basis to test and confirm the hypotheses that have been formulated in this study empirically.

Table 5: Regression Weights Results of Structural Equation Modeling (SEM) Analysis Using AMOS

Endogenous		Eksogen	Estimation	S.E.	C.R.	P	Remarks
Pro-Environmental Behavior	<--	Green Transformational Leadership	.792	.068	11.703	***	Confirmed
Pro-Environmental Behavior	<--	Green Culture	.124	.046	2.716	.007	Confirmed
Continuous Performance	<--	Pro-Environmental Behavior	.832	.073	11.341	***	Confirmed

Remarks: Estimation = path coefficient value; S.E. = Standard Error; C.R. = Critical Ratio; P = level of significance; shows a p value < 0.01.

The results of the Structural Equation Modeling (SEM) analysis with AMOS show that all hypotheses proposed in this research model are statistically confirmed. First, the Green Transformational Leadership variable had a positive and significant effect on Pro-Environmental Behavior, with an estimated value of 0.792 and a critical ratio (C.R.) value of 11.703 and a significance value of $p < 0.001$. These results indicate that the higher the quality of transformational leadership oriented towards environmental values, the higher the tendency of individuals in the organization to exhibit behaviors that support environmental sustainability. Furthermore, Green Culture was also proven to have a positive and significant influence on Pro-Environmental Behavior, with an estimated value of 0.124, a C.R. of 2.716, and a p value of 0.007. Although the estimated value of this relationship is lower than that of leadership influence, these findings still show that the existence of an organizational culture that internalizes sustainability values contributes to an increase in pro-environmental behavior among organizational members. Furthermore, Pro-Environmental Behavior was shown to significantly affect Sustainable Performance, with an estimated of 0.832, a C.R. of 11.341, and a p< value of 0.001. These results confirm that individual behavior in supporting environmentally friendly practices in the workplace contributes directly to the achievement of sustainable organizational performance, both in economic, social, and environmental aspects.

DISCUSSION

The Influence of Green Transformational Leadership on Pro-Environmental Behavior

The results of the Structural Equation Modeling (SEM) analysis showed that Green Transformational Leadership had a positive and significant effect on Pro-Environmental Behavior, with an estimated value of 0.792, a C.R. value of 11.703, and a significance level of $p < 0.001$. These findings show that leadership that integrates sustainability vision and environmental values has a very strong role in encouraging environmentally friendly behavior of MSME employees in the livestock sector.

Conceptually, green transformational leadership is a development of transformational leadership that emphasizes inspiration, example, and motivation of employees to achieve organizational goals while still paying attention to environmental aspects. Green leaders not only lead employees to achieve operational targets, but also instill ecological awareness through tangible examples, green vision communication, and support for sustainable practices. These findings are in line with research (Ahmed et al., 2024; Azhar & Yang, 2021; Chen et al., 2023; Priatna et al., 2025) which states that green transformational leadership has a significant effect on pro-environmental behavior through the internalization of sustainability values. Research (Muchsinati et al., 2025). It also shows that leaders who are environmentally oriented are able to shape employees' green attitudes and behaviors consistently (Nurfitriyana & Muafi, 2023). Further, (Saleh et al., 2024) found that green leadership is a key driver of employee engagement in eco-friendly activities in the workplace.

In the context of SMEs in the livestock sector, the role of leaders is increasingly crucial due to the relatively simple organizational structure and direct working relationships. Leaders who actively campaign for livestock waste management, energy efficiency, and sustainable resource utilization will more easily influence employee behavior. Research (Suriyankietkaew et al., 2022) affirms that the influence of green leadership is stronger on small and medium-sized organizations than on large companies due to the intensity of the interaction between leaders and employees.

In addition, (Robertson & Barling, 2015) states that green transformational leadership not only directly shapes pro-environmental behavior, but also creates a psychological climate that supports sustainability. Thus, the results of this study strengthen the argument that green transformational leadership is the main determinant in building pro-environmental behavior of livestock MSME employees.

The Influence of Green Culture on Pro-Environmental Behavior

The results of the hypothesis test showed that Green Culture had a positive and significant effect on Pro-Environmental Behavior, with an estimated value of 0.124, a C.R. value of 2.716, and a significance level of p = 0.007. Although its power of influence is lower than that of green transformational leadership, green culture has still proven to have an important contribution in shaping employees' eco-friendly behaviors.

A green culture reflects the values, norms, and habits of organizations that support sustainability practices, such as environmental stewardship, resource conservation, and responsible waste management. This culture serves as an unwritten guideline that directs employee behavior in daily work activities.

The results of this study are in line with the findings Pham et al., (2023) which shows that green organizational culture has a positive effect on pro-environmental behavior through the formation of green social norms. Research (Muhammad Alfian Nugroho, 2023) It also states that green culture creates positive normative pressures that encourage employees to act eco-friendly voluntarily. In addition, (Sey & Rachmawati, 2025) found that internalizing the values of green culture improves the consistency of pro-environmental behavior in the long run.

In the context of animal husbandry SMEs, green culture can be realized through simple but sustainable practices, such as the habit of maintaining cage cleanliness, processing livestock waste into organic fertilizer, and using water efficiently. Research (Nurfitriyana & Muafi, 2023) emphasized that green culture is very effective in organizations that are based on environmentally intensive operational activities, such as the agriculture and livestock sectors.

Further, (Nurfitriyana & Muafi, 2023) stated that green culture plays a supporting factor that strengthens the influence of green leadership on employee behavior. Thus, the results of this study show that green culture serves as a normative foundation that supports the formation of pro-environmental behavior in a sustainable manner

The Influence of Pro-Environmental Behavior on Sustainable Performance

The results of the SEM analysis showed that Pro-Environmental Behavior had a positive and significant effect on Sustainable Performance, with an estimated value of 0.832, a C.R. value of 11.341, and a significance level of $p < 0.001$. These findings indicate that the environmentally friendly behavior of employees makes a very strong contribution to the achievement of sustainable performance of SMEs in the livestock sector.

Sustainable performance includes a balance between economic, social, and environmental aspects. Pro-environmental behavior of employees, such as waste reduction, resource use efficiency, and concern for livestock welfare, has a direct impact on operational cost efficiency, product quality improvement, and positive business image.

The results of this study are in line with the findings (Danish et al., 2025) which states that pro-environmental behavior of employees is the main driver of the sustainable performance of the organization. Research (Islam et al., 2025) It also shows that pro-environmental behavior improves environmental and social performance, which ultimately has a positive impact on economic performance. In addition, (Shah et al., 2023) found that the green behavior of employees contributes significantly to the competitiveness and sustainability of SMEs.

In the livestock sector, pro-environmental behavior has very real implications, such as reducing environmental pollution, improving livestock health, and social acceptance from the surrounding community. Research (Deng et al., 2024) emphasized that employees' pro-environmental behavior is a key factor in the success of sustainability strategies in natural resource-based businesses. These findings are reinforced by studies (Muchsinati et al., 2025) which states that pro-environmental behavior serves as a key mediator between internal green practices and long-term sustainable performance.

Thus, the results of this study confirm that pro-environmental behavior is not only a consequence of green policies, but also a strategic asset that determines the sustainability of SMEs in the livestock sector.

CONCLUSION

Based on the results of the analysis, green transformational leadership has been proven to have a positive and significant effect on employees' pro-environmental behavior, showing that the vision, example, and commitment of leaders to environmental sustainability are able to encourage the formation of environmentally friendly work behaviors. Green culture also has a positive and significant effect on pro-environmental behavior, albeit with a lower degree of influence, meaning organizational values and norms still play a role in shaping sustainability-oriented work habits. Furthermore, pro-environmental behavior has been proven to have a positive and significant effect on the sustainable performance of SMEs in the livestock sector, so that the stronger the environmentally friendly behavior of employees, the higher the achievement of economic, social, and environmental performance simultaneously.

ADVICE

Practical Advice. SMEs in the livestock sector are advised to implement green transformational leadership systematically by identifying environmental problems, formulating solutions with employees, and integrating sustainability values in organizational culture. Strengthening green culture can be done through habituating environmentally friendly practices such as waste management, energy saving, and collective work based on local wisdom. In addition, pro-environmental behavior needs to be part of the business development strategy so that sustainable performance can be improved consistently and sustainably.

Future Research Agenda. The next research is suggested to develop models in other MSME sectors by adding variables such as organizational commitment, green innovation, or government support, as well as using a longitudinal approach to capture the dynamics of pro-environmental behavior change and sustainable performance over time.

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