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Sustainable Entrepreneurial Intention among Livestock Farmers: The Role of Green Entrepreneurial Mindset, Green Entrepreneurial Self-efficacy, and Environmental Awareness

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ABSTRACT

Sustainable entrepreneurship plays a crucial role in supporting economic growth and addressing environmental and social challenges to achieve sustainable development. Sustainable entrepreneurs are motivated by their intention to solve sustainability issues through an entrepreneurial approach. This study aims to explore the role of green entrepreneurial mindset, green entrepreneurial self-efficacy, and environmental awareness on the cultivation of sustainable entrepreneurial intention among livestock farmers. This study involved 280 entrepreneurial respondents in the livestock sector who had an interest in sustainable entrepreneurship. Data were collected using a closed questionnaire with a 5-point Likert scale and analyzed using Structural Equation Modeling (SEM) with the help of SmartPLS software. The study findings revealed that a green entrepreneurial mindset has a significant direct influence on sustainable entrepreneurial intention. Furthermore, green entrepreneurial self-efficacy and environmental awareness mediate the relationship between green entrepreneurial mindset and sustainable entrepreneurial intention. In addition, green entrepreneurial self-efficacy and environmental awareness have a positive and significant effect on sustainable entrepreneurial intention. This research provides an essential contribution to understanding how green entrepreneurial mindset, green entrepreneurial self-efficacy, and environmental awareness can encourage sustainable entrepreneurial intentions in the livestock sector. In addition, the results of this study emphasize the need for an environmentally conscious entrepreneurial approach in managing livestock businesses.

Keywords: *Green entrepreneurial mindset, Green self-efficacy, Environmental awareness, Sustainable entrepreneurial intentions*

Introduction

Increasing awareness of environmental issues, food security, and social welfare has driven the transformation of the entrepreneurial paradigm towards a more sustainable direction. With the emergence of global challenges such as climate change, environmental degradation, and food security crises, sustainable entrepreneurship has become an increasingly important strategic approach, particularly in the livestock sector. Sustainable entrepreneurship among livestock farmers is an important issue to balance economic goals with positive ecological and social impacts (Schaltegger and Wagner, 2011). In this context, sustainable entrepreneurial intention—namely, the individual's intention to start or develop a livestock business based on the principles of sustainability—plays an important role as a foundation for changing entrepreneurial behavior. This intention is a strong predictor of actual entrepreneurial action (Ajzen, 1985, 1991; Engle *et al*., 2010), so understanding and cultivating this intention is crucial for the transformation of the livestock sector towards a more sustainable direction.

In Indonesia, livestock is a strategic sector in supporting national food security, but still faces various problems such as low production efficiency, minimal adoption of green technology, and limited environmental awareness among livestock farmers (Badan Pusat Statistik, 2022). The livestock sector is one of the leading business sectors in Indonesia, but livestock contributes to increasing global warming that comes from dirt and

animal extraction. The livestock sector contributes to methane gas (CH_4), nitrous oxide (N_2O), carbon dioxide (CO_2), and ammonia, which can cause acid rain (Ishak *et al*., 2019). Therefore, strengthening sustainable entrepreneurial intention among Indonesian livestock farmers is an important step toward realizing inclusive and sustainable livestock development. By fostering a sustainability orientation from the intention stage, livestock farmers can become agents of change in encouraging agribusiness practices that are in line with sustainable development goals, especially in terms of responsible production and climate change mitigation.

Most research on entrepreneurial intention has focused on the Theory of Planned Behavior (TPB) framework that emphasizes the role of general intention without elaborating in depth on contextual green or sustainability aspects (Ajzen, 1985, 1991). Several studies have highlighted the importance of psychological and cognitive factors in driving sustainable entrepreneurial intention, but there is still a gap in comprehensively understanding the relationship between green entrepreneurial mindset, green entrepreneurial self-efficacy, and environmental awareness towards strengthening sustainable entrepreneurial intention.

Most previous studies have emphasized that an entrepreneurial mindset plays a vital role in shaping entrepreneurial intention because this mindset reflects an orientation towards opportunities, innovation, and risk-taking, which are the main foundations in the entrepreneurial process (Akbari *et al*., 2024; Benchrifa *et al*., 2017; Oulhou and Ibourk, 2023*).* Individuals with an entrepreneurial mindset tend to have a high motivation to start a business and can adapt to market dynamics. However, studies on the green entrepreneurial mindset that focus on linking entrepreneurship studies with environmental sustainability are still limited. In fact, in an era of increasing awareness of the climate crisis and ecological responsibility, understanding the role of the green entrepreneurial mindset in encouraging sustainable entrepreneurial intention is becoming increasingly important to study, especially in sectors such as agriculture and livestock that have a significant impact on the environment.

Farmers with a green entrepreneurial mindset tend to be more proactive in seeking innovative solutions such as the use of organic feed, integrated livestock systems, or environmentally friendly waste management technologies. Livestock businesses can have positive impacts, in the form of increasing livestock income, expanding employment opportunities, increasing food availability, especially meat, eggs, and milk, and increasing local revenue, but environmental and health issues related to livestock are sometimes less noticed. Livestock can pollute the environment through the disposal of livestock waste into the soil, surface water, and methane gas emissions into the atmosphere. Waste management is a significant issue that receives special attention. Some waste materials can be processed and reused through recycling. . A new facet of the circular economy is emerging in this regard (Širá *et al*., 2022). The green entrepreneurial mindset also encourages long-term orientation and awareness of the socio-ecological responsibility of the business practices carried out (Wang *et al*., 2024). Balancing the strength of competence and foundation to stimulate the growth of solid behavior to use green technology sustainably (Putri *et al*., 2025).

Several studies have shown that environmental awareness influences sustainable entrepreneurship (del Brío González *et al*., 2022; Mambali *et al*., 2024), but without self-confidence, this intention often fails to translate into action (Barrera-Verdugo *et al*., 2025; Donaldson *et al*., 2025). Both awareness and sustainable entrepreneurial self-efficacy are key psychological factors for farmers. Those who understand the environmental impact of livestock tend to adopt eco-friendly and ethical practices (Kirkwood and Walton, 2010). However, awareness alone is insufficient; farmers also need confidence to develop and apply green innovations. Green entrepreneurial self-efficacy helps them face technical, financial, and social challenges (Barrera-Verdugo *et al*., 2025; Mambali *et al*., 2024). Previous studies also stress the role of self-efficacy in building sustainable business intentions (Drakpa *et al*., 2024; Middermann *et al*., 2020). Thus, combining awareness and self-efficacy can encourage farmers to create livestock practices that are profitable and support long-term ecological and social sustainability (Parthiban *et al*., 2024).

Although several studies have highlighted the importance of psychological and cognitive factors in shaping sustainable entrepreneurial intention, there is still a gap a comprehensively understanding the relationship between green entrepreneurial mindset, green entrepreneurial self-efficacy, and environmental awareness in strengthening sustainable entrepreneurial intention. Therefore, further studies are needed that integrate the three variables in one conceptual framework to explain the psychological and behavioral mechanisms that drive the emergence of sustainable entrepreneurial intention, especially in the context of sectors such as livestock that have significant environmental impacts.

Literature Review

Overview of sustainable entrepreneurial intention

Theoretically, entrepreneurial intention can be conceptualized as an individual's motivation to start a new business or engage in entrepreneurial activities (Krueger and Brazeal, 1994; Thompson, 2009). Bullough *et al*. (2014) also stated that entrepreneurial intention is a cognitive condition that ultimately drives individuals to formulate new entrepreneurial ideas and pursue entrepreneurial

careers. Meanwhile, recently, the idea of sustainable entrepreneurial intention has emerged (Barrera-Verdugo *et al*., 2025; Chauhan *et al*., 2024; Diepolder *et al*., 2025). Sustainable entrepreneurial intention (SEI) refers to an individual's desire or tendency to start or develop a business that is not only oriented towards economic profit, but also considers social and environmental impacts sustainably. This concept developed from traditional intention theories, such as the Theory of Planned Behavior (Ajzen, 1991), but was modified to accommodate sustainability values. This intention is important because it is an early stage in the entrepreneurial process that can influence environmentally friendly business decisions, behaviors, and strategies. In the current context, sustainable entrepreneurial intention is an important indicator in driving the transformation towards a green economy and achieving sustainable development goals (SDGs) (Kuckertz and Wagner, 2010).

Sustainable entrepreneurial intention is a key connection between environmental sustainability and business practices, highlighting the role of entrepreneurs in tackling global challenges. The idea of SEI is strongly rooted in personal values that support sustainability, which greatly influence entrepreneurial mindsets. An individual's environmental and social values play a crucial role in developing sustainable entrepreneurial intention, showing how these values can motivate entrepreneurs to align their business practices with sustainable development goals (Yasir *et al*., 2023). Additionally, research indicates that when entrepreneurs have a strong focus on sustainability, they tend to build ventures that prioritize environmental and social factors alongside traditional economic concerns (Kuckertz and Wagner, 2010). This shift represents a move from a profit-centered approach to one that aims for a lasting, sustainable impact.

The influence of green entrepreneurial mindset on instilling sustainable entrepreneurial intention

The green entrepreneurial mindset develops from the basic theory of mindset. According to Freitas *et al*. (2004), mindset is considered a "cognitive operation." Mindset as automatic processing of stimuli can be viewed as a product of experience resulting from repeated exposure to tasks (Humphrey, 1951). The purpose of mindset is a type of pattern recognition that relates to the concept of stimulus in terms of behavior (Cui and Bell, 2022). Therefore, a green entrepreneurial mindset refers to an entrepreneurial mindset that incorporates environmental concerns, green innovation, and social responsibility. Individuals with this mindset not only conceptualize business opportunities from an economic viewpoint but also consider the ecological and social impacts of their activities. This mindset plays a crucial role in shaping sustainable entrepreneurial intentions because it encourages individuals to think long-term and act ethically toward the environment. Consequently, individuals with a green mindset tend to have a greater concern for the environmental impact of their business activities, making them more motivated to start a sustainable business.

From a psychological standpoint, a person's mindset significantly impacts intentions and behavior. Mindset can both influence and be shaped by a person's entrepreneurial activities (Daspit *et al*., 2023). Previous research indicates that an entrepreneurial mindset affects entrepreneurial intentions (Akbari *et al*., 2024; Cui and Bell, 2022). In this context, individuals with a green entrepreneurial mindset are highly attuned to sustainability issues and believe that entrepreneurship can be a way to bring about positive environmental change. In other words, this mindset combined with sustainability values directly influences the desire to establish a sustainable business. People with a green mindset are more likely to pursue opportunities that promote environmental solutions and are intrinsically motivated to generate positive social and ecological impacts (Gerlach, 2003; Schaltegger and Wagner, 2011). Therefore, the green entrepreneurial mindset serves as a catalyst in developing sustainable entrepreneurial intentions.

In addition, the green entrepreneurial mindset also plays an important role in shaping the self-efficacy of green entrepreneurship and individual environmental awareness. The green entrepreneurial mindset fosters an understanding that integrates environmental issues into business practices, encouraging entrepreneurs to recognize their potential impact on ecological sustainability. This mindset fosters self-efficacy by increasing individuals' beliefs in their ability to build and manage businesses that prioritize green practices. The concept of entrepreneurial mindset includes a cognitive framework that encourages individuals to embrace opportunities, innovate, and proactively face challenges, thereby creating an environment conducive to self-efficacy in sustainability-focused entrepreneurial ventures (Manafe *et al*., 2023; Solesvik *et al*., 2013). This cognitive approach is important because it is closely related to beliefs in one's ability to carry out business initiatives that prioritize environmental considerations (Andriyati *et al*., 2024; Jiatong *et al*., 2021).

In addition, environmental awareness among youth significantly drives their entrepreneurial intentions towards green ventures, indicating that a green entrepreneurial mindset fosters an effective approach to pursuing sustainability-oriented entrepreneurship (Bhardwaj *et al*., 2024). Furthermore, developing environmental awareness through GEM leads to greater risk-taking and innovative problem-solving in green initiatives, thereby strengthening the important relationship between mindset and self-efficacy in the context of entrepreneurship (Giudici *et al*., 2017).

Hypothesis 1: Green entrepreneurial mindset has a positive and significant effect on sustainable entrepreneurial intention
Hypothesis 2: Green entrepreneurial mindset has a positive and significant effect on green entrepreneurial self-efficacy
Hypothesis 3: Green entrepreneurial mindset has a positive and significant effect on environmental awareness

The role of green entrepreneurial self-efficacy and environmental awareness on sustainable entreprenerial intentions

The concept of self-efficacy introduced by Bandura (1997) refers to an individual's belief in their ability to organize and carry out the actions necessary to achieve a particular goal. There are many studies that highlight the importance of self-efficacy in various contexts (Saputro *et al*., 2024; Sari *et al*., 2024; Sumarni *et al*., 2025). In the context of entrepreneurship, this belief is known as entrepreneurial self-efficacy (ESE), which is the extent to which a person feels capable of starting and managing a business effectively (Chen *et al*., 1998). ESE is a strong predictor of entrepreneurial intentions because individuals with high self-efficacy are more confident to take risks, overcome obstacles, and pursue business opportunities (Drakpa *et al*., 2024; Elnadi and Gheith, 2021; Zhao *et al*., 2005).

Meanwhile, green entrepreneurial self-efficacy (GESE) is a development of the ESE concept that is more specific to the context of environmentally oriented businesses. GESE reflects an individual's belief that they are able to create, manage, and maintain a business that supports sustainability and is environmentally friendly (Guo, 2022). Although GESE is narrower, conceptually, GESE and ESE are interrelated because both are rooted in self-efficacy theory and reflect dimensions of personal beliefs in the context of entrepreneurship. Individuals with high ESE tend to develop GESE more easily, especially if they have strong environmental values and experience in green entrepreneurship activities.

Both ESE and GESE play an important role in shaping entrepreneurial intention, including sustainable entrepreneurial intention. Individuals who believe in their ability to manage entrepreneurial challenges, including in the environmental context, are more likely to have green business start-up intentions (Fayolle and Liñán, 2014). GESE specifically helps bridge the gap between the green entrepreneurial mindset and entrepreneurial intention by fostering confidence in implementing sustainable business ideas. In addition, environmental awareness also acts as a guide for internal values and motivations that strengthen sustainable entrepreneurial intentions. Individuals with high levels of environmental awareness tend to have positive attitudes toward sustainable business practices, which ultimately increases their likelihood of initiating businesses that pay attention to the balance between economic, social, and ecological aspects (Yusof *et al*., 2016).

In addition, environmental awareness also broadens individuals' perceptions of new market opportunities in the green sector, such as renewable energy, organic farming, and recycling, which then strengthens their beliefs in realizing sustainability-oriented entrepreneurial intentions (Kuckertz and Wagner, 2010). As we all know, the livestock sector is closely related to environmental pollution, where livestock waste (feces, urine, leftover feed) is a source of environmental pollution if not managed properly. Livestock waste processing is one effort that provides many benefits. On the one hand, waste processing will reduce the impact on the environment, on the other hand, waste processing will provide benefits because its processing can be used as fuel or organic fertilizer, and reduce the chances of creating conflict with other communities due to waste pollution caused.

Hypothesis 4: Green entrepreneurial self-efficacy has a positive and significant effect on sustainable entrepreneurial intention
Hypothesis 5: Environmental awareness has a positive and significant effect on sustainable entrepreneurial intention
Hypothesis 6: Green entrepreneurial self-efficacy mediates positively and significantly the relationship between green entrepreneurial mindset and sustainable entrepreneurial intention
Hypothesis 7: Environmental awareness mediates positively and significantly the relationship between green entrepreneurial mindset and sustainable entrepreneurial intention

Based on previous literature and studies, it can be concluded that green entrepreneurial mindset, green entrepreneurial self-efficacy, and environmental awareness have a crucial role to developing sustainable entrepreneurial intention among livestock farmers.Thus, the conceptual model of this study is shown in Figure 1.

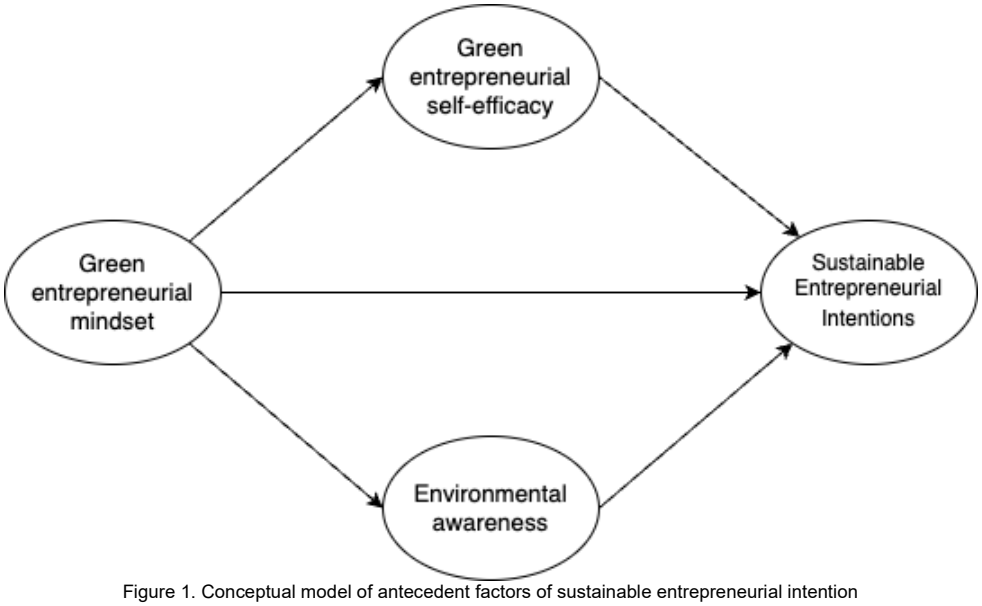

Figure 1. Conceptual model of antecedent factors of sustainable entrepreneurial intention

Materials and Methods

Respondents

This study is a quantitative study with a survey approach that aims to analyze the factors that influence entrepreneurial intentions in livestock farmers. The population in this study was cattle farmers who actively run their livestock businesses in the Boyolali Regency in the Central Java Province of Indonesia. There were 280 farmers involved to provide their perceptions regarding green entrepreneurial mindset, green entrepreneurial self-efficacy, environmental awareness, and sustainable entrepreneurial intentions. The distribution of respondents based on gender was 87% male and 13% female. Meanwhile, based on family background, there were 53% who had families with an entrepreneurial family background, and the rest did not have an entrepreneurial family background (47%). The average age of the farmers involved was 46 years. The data collection technique in this study was carried out through a direct survey using a structured questionnaire. Researchers visited respondents directly at the livestock business location to ensure that the questionnaire was filled out correctly and in accordance with the actual conditions of the farmers. Direct surveys were chosen so that respondents could be informed if there were questions that were not understood, so as to increase the validity of the answers.

Data collection

Sustainable entrepreneurial intentions

This study used a questionnaire adapted from Barrera-Verdugo *et al*. (2025) to measure sustainable entrepreneurship intentions. The questionnaire consists of five statements designed to capture an individual's commitment, career goals, and determination in pursuing entrepreneurship that is oriented towards environmental and social sustainability. One example of an item in the questionnaire is "I am willing to do whatever it takes to become a sustainable entrepreneur," which reflects the level of seriousness of the respondent in realizing his/her intention to become a sustainable entrepreneur. All statements in the questionnaire were measured using a five-point Likert scale, ranging from Strongly Disagree (1) to Strongly Agree (5). This scale allows researchers to capture the nuances of respondents' attitudes in more depth and quantitatively. This questionnaire has gone through a process of language and context adaptation to suit the characteristics of livestock respondents, and its validity and reliability have been tested before being used in primary data collection.

Green entrepreneurial mindset

In this study, the questionnaire of green entrepreneurial mindset was conducted using a questionnaire consisting of four statement items arranged based on adaptations of instruments relevant to the context of green entrepreneurship (Akbari *et al*., 2024). This questionnaire was designed to capture entrepreneurial mindsets that are oriented towards environmentally friendly innovation, openness to new information, and concern for the environmental impact of business activities. One example of an item in this instrument is “I am constantly communicating with others to get new information,” which reflects the respondent's proactive attitude in seeking new insights to support green entrepreneurship activities. All items are measured using a five-point Likert scale, ranging from Strongly Disagree (1) to Strongly Agree (5), to describe the respondent's level of agreement with each statement.

Green entrepreneurial self-efficacy

The questionnaire of green entrepreneurial self-efficacy in this study refers to a questionnaire developed by Mambali *et al*. (2024), which consists of three statements. This

questionnaire is designed to measure individuals' self-confidence in their ability to carry out entrepreneurial activities oriented towards environmental sustainability, such as designing innovative, environmentally friendly solutions, managing environmental risks in business, and making decisions that consider ecological impacts. One example of a statement in this questionnaire is "I believe that if I do it wholeheartedly, I can contribute to the environment". All items are measured using a five-point Likert scale, ranging from Strongly Disagree (1) to Strongly Agree (5). This questionnaire has gone through an adaptation process and validity testing in the livestock context to ensure the suitability of the content and its ability to accurately measure the construct of green entrepreneurial self-efficacy.

Environmental awareness

Farmers' perceptions of environmental awareness were measured using the environmental awareness questionnaire (Mambali *et al*., 2024). This questionnaire consists of six items, for instance "I get irritated when I think about the damage caused by pollution to our lives." This questionnaire was designed to capture the level of individual awareness of environmental issues, including concern for ecological damage, the impact of livestock farming on nature, and the importance of preserving natural resources in everyday life and in the context of entrepreneurship. All statements are measured using a five-point Likert scale, from Strongly Disagree (1) to Strongly Agree (5), to measure the level of respondent agreement quantitatively.

Data analysis

Data analysis in this study was conducted using the Structural Equation Modeling (SEM) approach facilitated by SmartPLS software. To evaluate the validity of each questionnaire item, an outer model analysis was used, where an indicator is considered valid if it has a loading factor > 0.70 and a Cronbach's alpha > 0.80, indicating that the item has high reliability. Furthermore, an inner model analysis was used to assess the direct and indirect effects between variables. Before that, the model must meet the eligibility criteria, including a Normed Fit Index (NFI) value > 0.800 and a Standardized Root Mean Square Residual (SRMR) < 0.080, as suggested by Hair *et al*. (2017). In hypothesis testing, decisions are based on the p-value, where the hypothesis is accepted if the p-value is < 0.05 and rejected if the p-value is > 0.05.

Results and Discussion

Validity and Reliability Test

Validity and reliability tests were conducted to ensure that the research questionnaire used could measure the constructs accurately and consistently. The criteria for questionnaire items to be declared valid were if the loading factor value was more than 0.7 (Hair *et al*., 2017). This study used a maximum iteration of 300, and the results of the outer model analysis are shown in Figure 2 and Table 1.

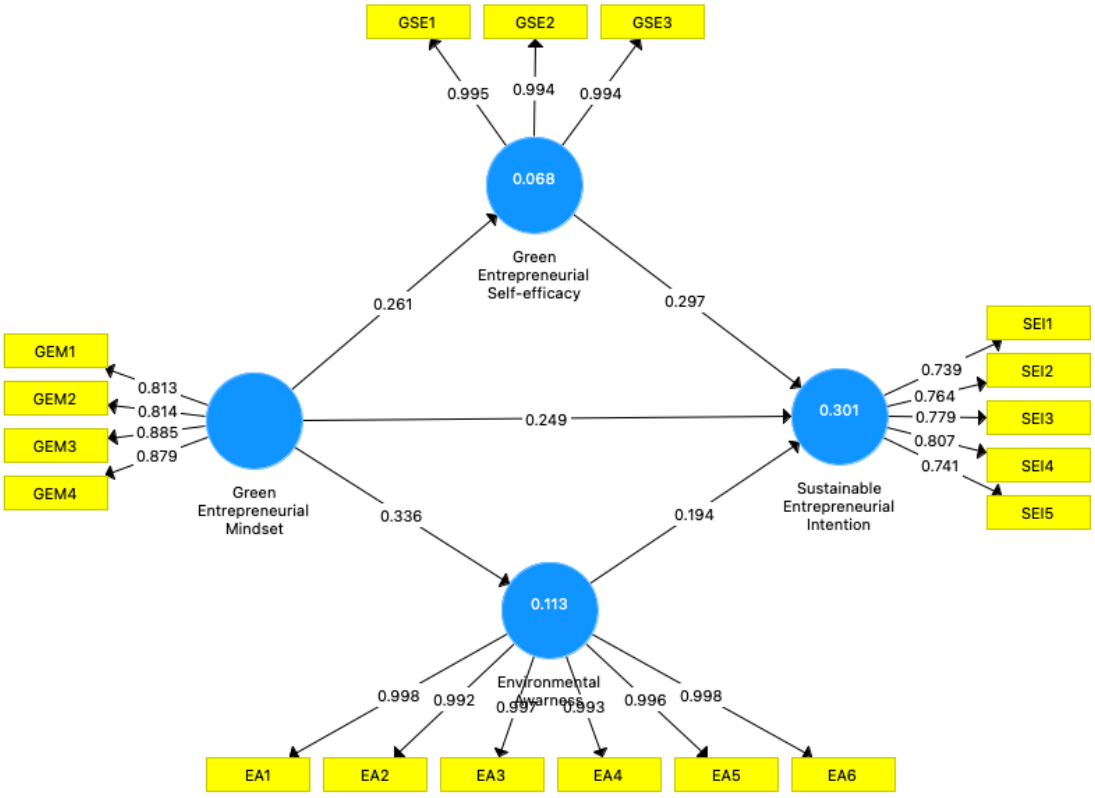

Figure 2. SEM models

The results of the outer model analysis show that all questionnaire items have a loading factor value above 0.70, which indicates that each indicator is valid in representing the intended construct (see Table 1). The green entrepreneurial self-efficacy questionnaire has a loading factor range between 0.994-0.995. In addition, the loading factor value of the green entrepreneurial mindset variable is in the range of 0.813-0.885. The environmental awareness questionnaire has a loading factor of 0.992-0.998. Lastly, the loading factor on the sustainable entrepreneurial intention questionnaire ranges from 0.776-0.794.

Table 1. Validity (Outer Loading)

Items	Green Entrepreneurial Self-efficacy	Green Entrepreneurial Mindset	Environmental Awareness	Sustainable Entrepreneurial Intention
GSE1	0.995			
GSE2	0.994			
GSE3	0.994			
GEM1		0.813		
GEM2		0.814		
GEM3		0.885		
GEM4		0.879		
EA1			0.998	
EA2			0.992	
EA3			0.997	
EA4			0.993	
EA5			0.996	
EA6			0.998	
SEI1				0.739
SEI2				0.764
SEI3				0.779
SEI4				0.807
SEI5				0.741

In addition, the Cronbach's alpha and Composite Reliability (CR) values for each variable are above the threshold of 0.70, indicating that the instrument has good internal reliability. The Average Variance Extracted (AVE) value of each construct also exceeds the minimum value of 0.50, indicating that more than half of the indicator variance can be explained by its construct (Hair *et al*., 2010). Thus, the results of the validity and reliability tests support the feasibility of using the instrument in testing the structural model in this study (see Table 2).

Table 2. Reliability test

Variable	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Environmental Awareness	0.998	0.998	0.999	0.992
Green Entrepreneurial Self-efficacy	0.994	0.994	0.996	0.989
Green Entrepreneurial Mindset	0.872	0.883	0.911	0.720
Sustainable Entrepreneurial Intention	0.825	0.826	0.877	0.588

Model fit analysis

Furthermore, this study analyzes the model fit, which is a crucial stage in the initial hypothesis testing. In this study, the analysis was conducted using a subsample of 500 observations with a significance level of 0.05. The results of the model feasibility analysis are presented in Table 3, with model feasibility indicators referring to the Normed Fit Index (NFI) and Standardized Root Mean Square Residual (SRMR) values. A model is declared feasible if it has an NFI of more than 0.80 and an SRMR value of less than 0.08. Based on the test results, the NFI value was obtained as 0.815 (higher than the minimum limit of 0.80) and the SRMR value was 0.068 (lower than the threshold of 0.08), indicating that the model meets the feasibility criteria.

Table 3. Criteria for Goodness of Fit Model

Criteria	Saturated Model	Estimated Model
NFI	0.828	0.815
SRMR	0.069	0.068

Hypothesis testing using SEM analysis

Hypothesis testing used SmartPLS inner model analysis to test the effects of green entrepreneurial mindset, green entrepreneurial self-efficacy, and environmental awareness on sustainable entrepreneurial intentions among livestock farmers. We used the bootstrapping method to see the significance of predictor factors of sustainable entrepreneurial intentions. The results of the hypothesis analysis of this study are shown in Figure 3 and Table 4.

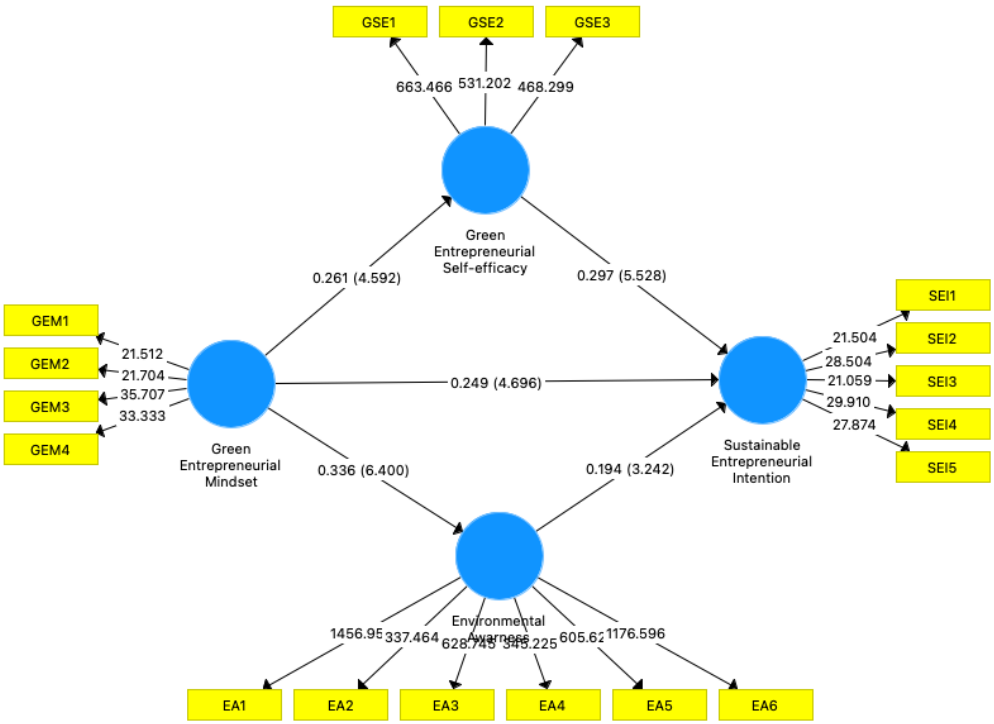

Figure 3. Inner model analysis

The results of the inner model analysis show that all hypotheses are accepted. The findings of this study prove that sustainable entrepreneurial intention is influenced by green entrepreneurial mindset (O = 0.249; p-value = 0.000), green entrepreneurial self-efficacy (O = 0.297; p-value = 0.000), and environmental awareness (O = 0.194; p-value = 0.001), each of the first to third hypotheses are accepted. In addition, green entrepreneurial mindset affects green entrepreneurial self-efficacy (O = 0.261; p-value = 0.000) and environmental awareness (O = 0.336; p-value = 0.000); each of the fourth and fifth hypotheses is accepted. Meanwhile, in the mediation test, both mediations, green entrepreneurial self-efficacy (O = 0.077; p-value = 0.002) and environmental awareness (O = 0.065; p-value = 0.004), significantly mediated the effect of the green entrepreneurial mindset on sustainable entrepreneurial intention.

Table 4. Results of direct influence test using SmartPLS

Path	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Green Entrepreneurial Mindset -> Sustainable Entrepreneurial Intention	0.249	0.253	0.053	4.696	0.000
Green Entrepreneurial Self-efficacy -> Sustainable Entrepreneurial Intention	0.297	0.299	0.054	5.528	0.000
Environmental Awareness -> Sustainable Entrepreneurial Intention	0.194	0.192	0.06	3.242	0.001
Green Entrepreneurial Mindset -> Green Entrepreneurial Self-efficacy	0.261	0.264	0.057	4.592	0.000
Green Entrepreneurial Mindset -> Environmental Awareness	0.336	0.341	0.052	6.400	0.000
Green Entrepreneurial Mindset -> Green Entrepreneurial Self-efficacy -> Sustainable Entrepreneurial Intention	0.077	0.08	0.025	3.121	0.002
Green Entrepreneurial Mindset -> Environmental Awareness -> Sustainable Entrepreneurial Intention	0.065	0.065	0.022	2.907	0.004

The findings of this study also analyze the most important predictor factors influencing sustainable entrepreneurial intention. The performance of each predictor factor of sustainable entrepreneurial intention is evaluated using the importance-performance map (IPM). The results of the IPM analysis are shown in Figure 4. The predictor factor of sustainable entrepreneurial intention that shows the best performance is green entrepreneurial mindset (total effect = 0.392). Furthermore, it is followed by other factors with the highest total effect of green entrepreneurial self-efficacy and environmental awareness (0.297, 0.194, and 24.699, respectively).

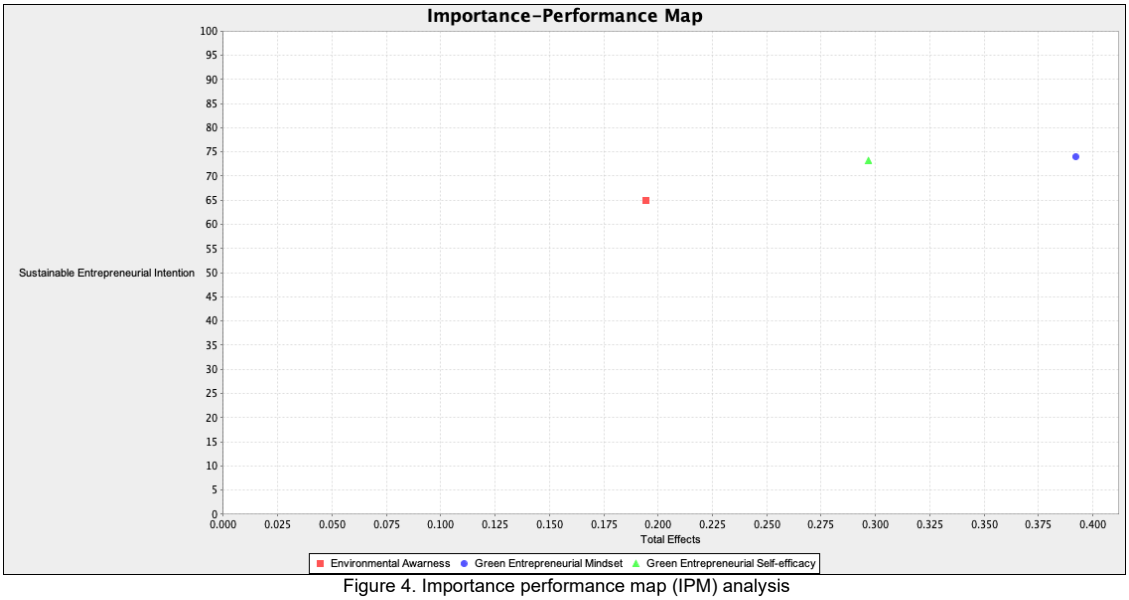

Figure 4. Importance performance map (IPM) analysis

Discussion

The emergence of important studies on sustainable development in various sectors has encouraged the transformation of the entrepreneurial paradigm towards a more sustainable direction, especially in the livestock sector. One form that has received attention from academics and practitioners is sustainable entrepreneurial intention. Studies on sustainable entrepreneurial intention are crucial in the livestock sector as they promote environmentally friendly, sustainable, and market-adaptive practices amid climate change. Livestock as a strategic sector in providing animal food is often faced with the problems of waste, environmental degradation, and resource efficiency. By understanding sustainable entrepreneurial intention, business actors in this sector can adopt green innovations, pay attention to animal welfare, and integrate sustainability values into the entire production process. Therefore, this study aims to explore the antecedent factors of sustainable entrepreneurial intention in beef and dairy cattle farmers.

Antecedent factors of sustainable entrepreneurial intention

One of the main objectives of this study is to analyze the antecedent factors that influence sustainable entrepreneurial intention among livestock farmers. The first hypothesis test in this study was aimed at examining the effect of green entrepreneurial mindset on sustainable entrepreneurial intention. The results of the analysis showed that a green entrepreneurial mindset has a positive and significant effect on sustainable entrepreneurial intention. This indicates that livestock farmers who have an entrepreneurial mindset oriented towards environmental sustainability tend to have a stronger intention to run an environmentally friendly and sustainable business. The findings of this study strengthen previous studies, which stated that an entrepreneurial mindset influences entrepreneurial intention (Akbari *et al*., 2024; Cui and Bell, 2022).

In addition, these findings strengthen the premise that a green entrepreneurial mindset is an important foundation in forming sustainable entrepreneurial intention that not only pursues economic profit but also pays attention to ecological and social aspects in business practices. In the context of livestock farming, this can be seen from the tendency of livestock farmers to start adopting environmentally friendly practices, such as efficient management of livestock waste as organic fertilizer and biogas energy sources, the use of natural feed such as the use of agricultural waste as a source of green fodder, and the application of green technology in the production process, such as the use of microbial protein in livestock feed to increase productivity and reduce greenhouse gas emissions. These findings indicate that strengthening the green entrepreneurial mindset among livestock farmers is a strategic step in encouraging the transformation of the livestock sector towards a more sustainable and environmentally responsible direction.

In addition, the findings of this study also show that sustainable entrepreneurial intention is significantly influenced by green entrepreneurial self-efficacy, as evidenced by the acceptance of the fourth hypothesis. These results indicate that an individual's self-confidence in their ability to carry out environmentally oriented entrepreneurial activities is an important factor in forming the intention to become a sustainable entrepreneur. This finding is in line with previous research by Fayolle and Liñán (2014), which emphasized that individuals who have high confidence in their capacity to manage environmentally friendly businesses tend to show stronger intentions to start and develop green businesses. Other scholars have also expressed the same findings, namely

that green entrepreneurial self-efficacy is a strong predictor in driving individual beliefs to overcome challenges in running an environmentally friendly business (Mambali *et al*., 2024). Farmers who have high green entrepreneurial self-efficacy will be more confident in adopting green innovations that pay attention to ecosystem balance. Self-efficacy to manage these challenges is the main driver in forming farmers' commitment to running a sustainable business.

Another antecedent factor that also influences sustainable entrepreneurial intention among livestock farmers is environmental awareness (the fifth hypothesis is accepted). The findings of this study indicate that the higher the level of awareness of livestock farmers towards environmental issues, the greater their tendency to have sustainable entrepreneurial intentions. Environmental awareness reflects the extent to which individuals understand the impact of economic activities on the environment and the urgency to take environmentally friendly actions in running their businesses. In this context, livestock farmers who are aware of environmental degradation, climate change, and the importance of maintaining ecosystems tend to be more open to implementing sustainable practices in their livestock businesses.

This study is in line with previous findings that emphasize that environmental awareness plays an important role in shaping pro-environmental behavior in the context of entrepreneurship (Kuckertz and Wagner, 2010; Yusof *et al*., 2016). Environmentally conscious individuals are more likely to consider the ecological impacts of their business activities and strive to develop innovative solutions that reduce environmental damage. Environmental awareness also strengthens the ethical dimension in business decision-making, where livestock farmers do not only pursue economic profit alone, but are also responsible for the social and ecological impacts of their business activities. It is undeniable that cattle farming will produce waste, which if not processed properly will disrupt people's lives and can cause disputes or conflicts, so green technology, in the form of processing waste into fertilizer and biogas is considered to be able to reduce the negative impacts of waste and is considered appropriate to minimize social conflicts in society.

The role of green entrepreneurial mindset

In addition to having an influence on sustainable entrepreneurial intention, the green entrepreneurial mindset also influences green entrepreneurial self-efficacy and environmental awareness of farmers. The second and third hypothesis tests revealed that a green entrepreneurial mindset has a direct influence on green entrepreneurial self-efficacy and environmental awareness among farmers. These findings indicate that the stronger the entrepreneurial mindset oriented towards sustainability and the environment possessed by farmers, the greater their level of self-confidence in running a green business, and the higher their awareness of environmental issues. Previous studies have also shown that an entrepreneurial mindset can encourage individuals to embrace opportunities, innovate, and face challenges proactively, thus creating an environment conducive to self-efficacy in sustainability-focused entrepreneurial efforts (Andriyati *et al*., 2024; Manafe *et al*., 2023; Solesvik *et al*., 2013).

Sustainability-oriented farmers are increasingly seen as key players in addressing pressing environmental issues such as climate change and pollution, thereby turning environmental challenges into entrepreneurial opportunities (Sung and Park, 2018). This is in line with the results of the study by Runtuni and Dewanti (2019), namely that the use of livestock waste in biogas can save fuel costs. This form of savings includes purchasing LPG fuel, because before using biogas, they used LPG. Other savings in terms of fertilizer, farmers usually always use urea fertilizer to fertilize their plants, but by using organic fertilizer from biogas waste, farmers can save more on fertilizer expenses. Biogas technology with a zero waste concept is expected to help slow the rate of global warming. In addition to being an alternative energy source, biogas can also reduce environmental problems, such as air pollution, soil pollution, and global warming (Sari *et al*., 2024).

In the context of livestock farming, the green entrepreneurial mindset acts as a psychological foundation that shapes the perspective and attitude of livestock farmers towards environmentally sustainability-oriented entrepreneurial practices. Farmers who have this mindset not only focus on increasing productivity and profits, but also consider the long-term impact on the environment and society. The belief in their ability to run an environmentally friendly livestock business becomes an internal force that drives them to try, innovate, and persist. This is reflected in the implementation of sustainable production methods, such as waste biofermentation systems, efficient feed management, and reduced antibiotic use.

Furthermore, the green entrepreneurial mindset also strengthens farmers' awareness of the relationship between their business activities and the surrounding ecological conditions. This awareness encourages the emergence of moral and social responsibility which has an impact on minimizing negative impacts on the environment and solving local environmental problems. This green mindset enables farmers to see business opportunities from environmentally friendly practices. Therefore, the green entrepreneurial mindset is an important element in driving the transformation of the livestock sector towards a more sustainable, inclusive, and adaptive system to global environmental challenges.

The role of mediators: green entrepreneurial self-efficacy and environmental awareness

This study also examines the mediator role of green entrepreneurial self-efficacy and environmental awareness in the relationship between green entrepreneurial mindset and sustainable entrepreneurial intention among livestock farmers. The role of green entrepreneurial self-efficacy as a mediator in the relationship between green entrepreneurial mindset and sustainable entrepreneurial intention shows that livestock farmers' self-confidence in their ability to manage environmentally friendly businesses is an important bridge in transforming mindsets into real intentions. Although a livestock farmer has a mindset that supports sustainability, without the belief that they are able to implement the practice, the intention to start or develop a sustainable business tends not to be formed strongly. This finding is in line with the Social Cognitive Theory (Bandura, 1997), which states that self-efficacy plays a key role in directing individual behavior through cognitive, motivational, and affective processes. In the livestock context, green entrepreneurial self-efficacy encourages livestock farmers to overcome technical and financial challenges in implementing green innovations, thereby strengthening the transition from mindset to intention.

Meanwhile, environmental awareness also acts as a mediator that strengthens the relationship between the green entrepreneurial mindset and sustainable entrepreneurial intention. Farmers who have a green entrepreneurial mindset will more easily understand the importance of maintaining the ecosystem and the impact of livestock activities on the environment when they have a high level of environmental awareness. This awareness then becomes a moral and cognitive motivator to design a business that is in line with the principles of sustainability. Previous studies by Mambali *et al*. (2024) showed that environmental awareness can increase the urgency and concern of business actors for sustainability, which ultimately strengthens the intention to act sustainably. This mediator role is evident in the tendency of environmentally conscious farmers to proactively seek alternative solutions, such as using organic materials, managing waste wisely, or forming collaborations with other green business actors. Therefore, increasing green self-efficacy and environmental awareness is a strategic key in optimizing the influence of the green mindset on sustainable entrepreneurial intentions among farmers.

Conclusion

The results of this study reveal that the sustainable entrepreneurial intention of livestock farmers is influenced by green entrepreneurial mindset, green entrepreneurial self-efficacy, and environmental awareness. In addition, green entrepreneurial mindset also directly influences green entrepreneurial self-efficacy and environmental awareness among livestock farmers. Another finding is that entrepreneurial self-efficacy and environmental awareness mediate the effect of a green entrepreneurial mindset on sustainable entrepreneurial intention. The implications of these findings emphasize the importance of interventions that not only instill a green entrepreneurial mindset but also build livestock farmers' confidence to implement environmentally friendly practices and improve their understanding of environmental issues. Therefore, training programs and policies for sustainable livestock development need to integrate cognitive, psychological, and environmental value in an integrated manner to build a more adaptive, innovative, and environmentally sustainable entrepreneurial ecosystem.

Conflict of interest

No potential conflict of interest relevant to this article was reported. All authors have agreed with the contents of the manuscript.

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Author’s contribution

The authors confirm their contribution to the paper as follows: study conception and design: AIS, INS; data collection: INS, SHP, ETR; analysis and interpretation of results: AIS, INS, SE; draft manuscript preparation: AIS, INS.

Ethics approval

This article does not involve animal subjects, so ethical approval for animal studies is not necessary in the present study.

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