Exploring the Personality Types of Sheep Farmers and Influencing Factors in Banjarnegara Regency

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Abstract. This study explores the personality types of sheep farmers in Banjarnegara Regency and the influencing factors to their personality. Utilizing a quantitative approach with survey design, we collected data from 100 sheep farmers across various agroecological zones in the regency. The analysis revealed that the majority of sheep farmers were middle-aged (48.7 years on average) and extroverted (59%). Extroverted farmers tend to be younger, more open to innovation, and having higher education levels than their introverted counterparts. Logistic regression analysis identified age and education as significant factors influencing personality types ($p<0.05$), with older farmers were more likely introverted while extroverted farmers were associated with higher education levels. The findings suggest that personality traits drive sheep farmers in their farming practices, decision-making, and adaptability to change. This study has underscored the importance of tailored training programs and educational opportunities to enhance the productivity and welfare of sheep farmers in Banjarnegara. Future research should delve deeper into the interplay between personality types and other socio-economic factors to develop more effective empowerment strategies for livestock farmers.

Keywords: Extroversion, Introversion, Sheep farmers, Logistic regression analysis

Abstrak. Penelitian ini mengeksplorasi tipe kepribadian peternak domba di Kabupaten Banjarnegara dan faktor-faktor yang mempengaruhi tipe kepribadian tersebut. Dengan menggunakan pendekatan kuantitatif dengan desain survei, data dikumpulkan dari 100 peternak domba di berbagai zona agroekologi di kabupaten tersebut. Analisis menunjukkan bahwa sebagian besar peternak domba berusia paruh baya (usia rata-rata 48,7 tahun) dan sebagian besar ekstrovert (59%). Petani ekstrovert cenderung lebih muda, lebih terbuka terhadap inovasi, dan memiliki pendidikan lebih tinggi dibandingkan petani introvert. Analisis regresi logistik mengidentifikasi usia dan pendidikan sebagai faktor signifikan yang mempengaruhi tipe kepribadian ($p<0,05$), dimana petani yang lebih tua cenderung introvert dan tingkat pendidikan yang lebih tinggi dikaitkan dengan ekstroversi. Temuan ini menunjukkan bahwa ciri-ciri kepribadian mendorong praktik pertanian, pengambilan keputusan, dan kemampuan beradaptasi petani domba terhadap perubahan. Studi ini menggarisbawahi pentingnya program pelatihan dan kesempatan pendidikan yang disesuaikan untuk meningkatkan produktivitas dan kesejahteraan peternak domba di Banjarnegara. Penelitian di masa depan harus menyelidiki hubungan antara tipe kepribadian dan faktor sosial ekonomi lainnya untuk mengembangkan strategi pemberdayaan yang lebih efektif bagi peternak.

Kata kunci: Ekstrovert, Introvert, Peternak domba, Analisis regresi logistik

Introduction

Banjarnegara is one of regions in Indonesia with significant potential in livestock farming, especially sheep farming. Banjarnegara consists of 20 districts spread in three agroecological zones: upper (above 1,000 meters above sea level/masl), middle (500-1,000 masl), and lower (below 500 masl). Sheep farming in Banjarnegara, run on various operational scales from traditional to modern, is an economic activity and integral part of the local social and cultural life in the region. The productivity and welfare of sheep farmers in this region are diverse and significantly influenced by various factors, including farmer's personality (Crase & Maybery, 2004; Munoz et al., 2019). Personality is defined as a set of characteristic traits and consistent behaviour patterns possessed by an individual (Iqra et al., 2016). In the context of livestock farming, personality can influence how farmers manage livestock, make decisions, adapt to changes in both technical and economic aspects (Schröter & Mergenthaler, 2021), and

interact with the surrounding environment, thus impacting business profitability (O'Leary et al., 2018). Accordingly, various personality types, such as extroverted and introverted, can influence how farmers run their businesses in terms of technology adoption, risk management, and cooperation patterns with other farmers (Farris et al., 2024).

Introverted farmers tend to be more reserved, reflective, and cautious in making decisions. They are usually more comfortable working alone or in small groups and focus more on details and long-term planning. Extroverted farmers are more open, energetic, and action-oriented. They tend to adapt more easily to changes, are active in social groups, and are more willing to take risks in their livestock business. Both personality types have their own strengths and weaknesses that can affect the performance and success of sheep farming. For example, introverted farmers may excel in planning and detailed management, while extroverted farmers may be more effective in social networking and adopting new technologies (Khalil, 2016).

Farmers' personality traits do not develop in isolation but are influenced by various internal and external factors (Salonen et al., 2023), such as level of education which is reflected in their knowledge, attitude, and skills in managing livestock businesses. Years of farming experience can shape farmers' mindsets and approaches to dealing with various situations and challenges. Age is also an important factor influencing farmers' personalities as it affects farmers' level of energy, experience, and risks taking. Also, younger farmers tend to embrace innovation and change, while older farmers may cling to traditional methods.

Investigating personality traits of sheep farmers and their influencing factors in Banjarnegara Regency is crucial as it provides deeper insights into the extent of personality types affecting livestock management (Villano et al., 2023). This initiative can support the development of livestock sector through formulating more accurate strategies and policies to empower sheep farmers in the regency. However, to the best of our knowledge, research on the personality types and their influencing factors of sheep farmers in the region is scarce. Accordingly, this study identifies the dominant personality types among sheep farmers, analyzes the factors influencing these personality types, and draws correlation to farming business performance. This study offers some empirical data to formulate more targeted policies and empowerment programs for farmers in Banjarnegara, leading to improved farmers' performance and welfare. It also fills the literature gap on the personality types of farmers in Indonesia, particularly in Banjarnegara Regency.

Materials and Methods

This study uses a quantitative approach with a survey design to identify the personality types of sheep farmers in Banjarnegara Regency and the influencing factors. Quantitative approach with a survey allows data collection from a larger sample, making the research results more generalizable to a wider population (Ponto, 2015). The population in this study was all sheep farmers in Banjarnegara Regency, selected through the multistage sampling techniques. In the first stage, we randomly selected 20% of districts in each agroecological zone of Banjarnegara, resulting in 3 districts from the upper zone, 3 from the middle zone, and 4 from the lower zone. In the second stage, we applied quota sampling to survey 100 sheep farmers, selecting 10 farmers from each district without probability sampling. The 10 farmers from each district consisted of 5 farmers aged 45+ and 5 farmers younger than 45 years. Quota sampling is suitable for situations where probability sampling is inapplicable, but can produce results similar to probability sampling (Iliyasu & Etikan, 2021; Ochoa & Porcar, 2018). Questionnaire-led interviews were conducted to collect data of

respondents' knowledge, attitude, and behavior (Roberts, 2012). In this study, the questionnaire collected demographic information about the farmers (including age, education level, farming experience, farm size, and family dependents), served as a tool of personality test using validated personality instruments to assess introvert and extrovert types, and identified the factors influencing personality, such as age, education, family dependents, and farming experience.

The collected data were analyzed using descriptive and inferential statistical methods. First, descriptive analysis was performed to describe the demographic characteristics of the farmers and personality types. Jung's Type Indicator (JTI) Test was used to categorize the farmers into extrovert or introvert personality types (Crellin, 2014). Then, Logistic Regression Analysis analyzed the factors influencing the farmers' personality types, coding extrovert personality as (1) and introvert as (2). Wulansari et al (2021) stated that logistic regression allows the examination of relationship between independent variables (influencing factors) and the dependent variable (personality type or individual preferences).

Results and Discussion

Socio-Economic Characteristics of Sheep Farmers in Banjarnegara Regency

Based on the research results, several socio-economic characteristics of sheep farmers in Banjarnegara Regency were found to affect their livestock business performance and success (see Table 1).

The average age of sheep farmers in Banjarnegara is 48.70 years, indicating that most farmers are mature and experienced in running livestock business. These factors can influence their decisions in livestock management. It is in line with Lianou & Fthenakis (2021) that the farmers worldwide is 45-48 years on average, and tends to be older in rural areas (Wilkinson, 2009).

Around 21% of sheep farmers in Banjarnegara managed sheep farming as their main business, implying that sheep farming was not the primary source of livelihood of most farmers in the regency. Farmers who dedicate 30-40 hours per week to sheep farming can reasonably consider it their primary occupation (Munoz et al., 2019; Voaklander et al., 2010), tend to be more focused and serious in managing their livestock business as their main source of income.

The average family size of farmers was 4 persons. This family size provides an overview of the economic dependents and available human resources within the farmers' families. Larger families can provide additional labor in managing the farm but have more dependents that farmers must support.

Table 1. Sheep Farmers' Socio-Economic Characteristics in Banjarnegara Regency

Variable	Mean
Age (year)	48.70
Sheep farmers as main business (%)	21.00
Family size (persons)	4.00
Formal education (year)	7.00
Goat farming experience (year)	6.51
Farm size (Animal Unit)	0.43

The average formal education of farmers is 7 years, equivalent to basic education through early middle school. Many farmers are economically challenged, so taking further levels of educations may seem unattainable. Other factors that further discouraged rural farmers to seek formal educations are lack of schools and educational infrastructure, long distance, poor transportation, and the need for extra resources. Meanwhile, education level can affect the farmers' ability to access information and technology and adopt innovations in farming. Higher education is usually associated with increased business efficiency and productivity. As reported by previous studies, education, age, and farm scale are important factors to consider as they greatly influence livestock management and the adoption of advanced farming technology (Corner-Thomas et al., 2017; Odintsov Vaintrub et al., 2021).

The average sheep farming experience is 6.5 years. Experience is a vital asset for farmers in managing livestock, handling animal health issues, and understanding production and market cycles. Sufficient experience can enhance the farmers' skills and knowledge, ultimately improving productivity and welfare. Coleman & Hemsworth (2014) stated that experienced and trained farmers in livestock breeding tend to have better business productivity than their lesser counterparts.

The average farm scale of sheep farmers in Banjarnegara District is 0.43 Animal Units, which means every farmer keeps 0.43 animals in their farm. This figure represents a relatively small-scaled sheep farming and farmers' capacity to manage and care for their livestock. While easier to manage with limited resources, mall-scale farming may face challenges in economy and efficiency. Lalljee., et al (2019) stated that limited farm scale can be increased in terms of cattle size and management to make the business more profitable and efficient.

Personality Types of Sheep Farmers in Banjarnegara Regency

This study identified the socio-economic characteristics of sheep farmers and tried to understand the dominant personality types of sheep farmers in Banjarnegara Regency. Personality types can influence how farmers manage their business, interact with the social environment, and make strategic decisions. This study uses Jung's Type Indicator (JTI) to categorize farmers into extrovert and introvert types.

Table 2. Personality Types of Sheep Farmers' in Banjarnegara Regency

Personality types		
Extrovert (59%)	Age	45.96
	Family size	4
	Farming experience	6.37
	Education	7
	High land (%)	11.8
	Middle land (%)	28.8
	Low land (%)	59.4
Introvert (41%)	Age	52.65
	Family size	4
	Farming experience	6.70
	Education	6.00
	High land (%)	56.1
	Middle land (%)	31.7
	Low land (%)	12.2

The analysis results are presented in Table 2, showing the distribution of farmers' personality types and related variables such as age, family size, farming experience, and education level.

Table 2 shows that the majority of sheep farmers in Banjarnegara (59%) have an extroverted personality, and the rest 41% are introverted. Extroverted farmers are generally more open to social interactions, high-energy, and action-oriented, adaptive to changes, active in social groups, and more willing to take risks in their farming business (Zafar & Meenakshi, 2012). Conversely, introverted farmers tend to be more reserved, reflective, cautious in making decisions, more comfortable working alone or in small groups, and focusing on detail and long-term planning. Extroverted sheep farmers in Banjarnegara can contribute in adaptation to innovation and social network development, two crucial elements in the dynamic livestock sector. However, introverted personalities may outperform their extroverted counterparts in conducting thorough planning and careful management, which are also essential in ensuring the sustainability of the livestock business. Farmer personality is important element in influencing farmer's behavior, which impacts business profitability. Specifically, farmer's attitudes, emotions, and behaviours greatly affect good practices in farming and running the livestock business (O'Kane et al., 2017; O'Leary et al., 2018).

The average age of extroverted and introverted farmers is 46 and 53 years. Younger, extroverted farmers may be more open to social interactions and changes, have a higher overall productivity, profitability, and investment than their older counterparts (Hamilton et al., 2015). Older, introverted farmers tend to be more reflective and cautious, risk-averse, less willing to experiment, and less likely to adopt new technologies (Brown et al., 2019a).

The average family size of extroverted farmers is 4 people, while the average family size of introverted farmers is 4 people. Although not very significant, introverted farmers have slightly larger family sizes than extroverted farmers. Larger family sizes can mean more labor support in the farming business and more dependents.

The average farming experience of extroverted and introverted sheep farmers is similar, 6.37 years and 6.70 years, respectively. Sufficient farming experience is an important asset in managing livestock and facing challenges in the farming business.

The average education level of extroverted and introverted farmers is 7.32 years, and 6.00 years, respectively. Extroverted farmers tend to have a higher education level, associated with better abilities to access information and technology and more openness to innovation in farming. Extroverted and well-educated farmers are more open to adopting technology and innovation in farming. As reported by previous studies, extroverted personality is strongly related to knowledge acquisition that affects technology adoption (Akhavan et al., 2016; Martin-Collado et al., 2021).

This distribution In Table 2 suggests that extroverted personalities may be more suited or attracted to the lowland agroecological zones, while introverts are more commonly found in highland zones. Older, introverted farmers may find sheep farming in quiet and remote highlands more suitable as it requires patience and attention to detail. Younger, extroverted farmers better thrive in the lowlands with better access to markets and innovation, as well as a more social and dynamic environment (Melville et al., 2023; Tian et al., 2022). The middle land zone has both extroverts and introverts, indicating less variation in personality types compared to the other zones.

Social Factors Influencing the Personality Types of Sheep Farmers in Banjarnegara Regency

Table 3 presents the results of the logistic regression analysis on factors influencing the personality types of sheep farmers in Banjarnegara Regency.

Table 3. Omnibus Test of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	48.542	4	.000
	Block	48.542	4	.000
	Model	48.542	4	.000

This analysis determined the relationship between independent variables (age, family size, farming experience, and education) and the dependent variable (extrovert and introvert personality).

The Omnibus Test shows that the logistic regression model is overall significant ($p < 0.001$), indicating that the model with independent variables provides better predictions compared to the model without independent variables. Logistic regression is a powerful statistical method for analyzing binary outcomes and predicting probabilities based on several predictors (Stoltzfus, 2011). Smith & Mckenna (2013) added that model adequacy is usually assessed using the omnibus chi-square test, which evaluates whether the full model significantly improves predictions compared to the intercept-only model.

The model summary in Table 4 shows a -2 Log likelihood value of 86.830, which is used to assess model fit. The Cox & Snell R Square and Nagelkerke R Square values of 0.385 and 0.518, respectively, indicate that the independent variables in this model explain about 38.5% to 51.8% of the variability in farmers' personality types.

The Hosmer and Lemeshow Test shows a Chi-square value of 3.695 with a significance level of 0.884. A p-value greater than 0.05 indicates that the model fits well, and no evidence stating otherwise.

Based on the B values in Table 6, the equation model formed is as follows: Ln P/1-P = 13.89 - 0.306 Age + 0.564 Family size - 0.057 Farming experience + 0.494 Education. The coefficient (B) value for age of -0.306 with a significance level of $p < 0.001$ indicates that age negatively and significantly influences the likelihood of being extroverted. Each additional year of age reduces the likelihood of a sheep farmer being extroverted by 1.359 times.

Table 4. Model summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	86.830[a]	.385	.518

Table 5. Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	3.695	8	.884

Table 6. The Influence of Independent Variables on Personality Types of Sheep Farmers in Banjarnegara Regency

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1	Age	-.306	.070	18.98	1	.000	1.359
	Family size	.564	.330	2.92	1	.087	1.757
	Farming experience	-.057	.086	.438	1	.508	.945
	Education	.494	.232	4.54	1	.033	.610
	Constant	13.89	3.923	12.53	1	.000	.000

Extroverted farmers are generally younger and more open to innovation, meanwhile introverted farmers are older and less inclined towards social interactions. Younger farmers in Banjarnegara tend to have extroverted personalities, characterized by their openness to innovation and willingness to try new things. At a relatively young age, they may be more enthusiastic about adopting new technology or modern farming practices that can increase farm productivity. Brown et al (2019) explained that older farmers tend to be more risk-averse, less likely to adopt new technologies, and more focused on financial performance, thus categorizing them as more introverted.

The coefficient value for family size of 0.564, with a significance level of p = 0.087, indicates that family size has a positive influence on the likelihood of being extroverted, although this influence is not significant at the 95% confidence level. Similarly, the coefficient value for farming experience of -0.057, with a significance level of p = 0.508, indicates that farming experience does not significantly influence personality type.

The coefficient value for education of 0.494 with a significance level of p= 0.033 indicates that education positively and significantly influences the likelihood of being extroverted. Each additional year of education increases the likelihood of a farmer being extroverted by 0.610 times. Educated farmers in Banjarnegara are more likely to actively seek information and training opportunities, participate in farmer groups, and engage in activities that require social interaction and networking, all of which are characteristics of extroversion. Kassenboehmer et al (2018) explained that individuals with higher education (university level) are more likely to have extroverted characteristics and are more likely to adopt technology and improve skills.

Conclusions

This study reveals important findings regarding the personality dynamics of sheep farmers in Banjarnegara Regency and the factors that influence them. The average age of sheep farmers is 48.7 years, and the majority (79%) run sheep farming as their main business. Extroverted farmers tend to be younger (average 45.96 years) and more open to innovation and social interaction, while introverted farmers are older (average 52.65 years). Extroverted farmers have a higher level of education (average 7.32 years) compared to introverted farmers (average 6 years). Age and education are significant factors influencing the personality type of farmers, with older age being associated with introverted personality and higher education being associated with extroverted personality. Family size and farming experience did not significantly influence farmers' personality type. This study recommends the provision of training focused on advanced farming techniques and modern agricultural technology for younger, extroverted farmers. Such programs can leverage their openness to and enthusiasm to take leadership in agricultural innovation. Given that education is associated with openness to innovation and extroversion, accessible educational opportunities, such as workshops or online learning, should be provided to enhance the knowledge of all farmers in Banjarnegara Regency.

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