

# The Relationship Between Entrepreneurial Characteristics of Farmers and The Performance of Shallots Farming in The Bantul Regency

Okwi Wijaya<sup>1,\*</sup>, Dwito Mufti Agung<sup>1</sup>, Norsida Man<sup>2</sup> and Muhammad Fauzan<sup>1</sup>

<sup>1</sup> Department of Agribusiness, Faculty of Agriculture, Universitas Muhammadiyah Yogyakarta, Indonesia

<sup>2</sup> Department of Agribusiness and Bioresource Economics, Faculty of Agriculture, Universiti Putra Malaysia (UPM), Malaysia

**Abstract.** This study aims to examine the relationship between entrepreneurial characteristics and the performance of shallots farming in Selopamiro Village, Imogiri District, Bantul Regency. Using a sample of 63 farmers selected through multistage random sampling, the research analyzed five entrepreneurial characteristics: leadership, self-confidence, risk-taking, hard work, and innovativeness. Data were collected through questionnaires and analyzed using descriptive analysis and the Spearman rank correlation test. The findings revealed that leadership and innovativeness had significant positive correlations with both sales volume and profit, while risk-taking was significantly correlated with profit. These results indicate that enhancing entrepreneurial characteristics can lead to improved farming performance. The study recommends implementing training programs, improving access to resources, developing supportive policies, strengthening extension services, and promoting collaboration among farmers to enhance their entrepreneurial capabilities and achieve better farming outcomes.

## 1 Introduction

Shallots are one of the horticultural commodities that play a strategic role in Indonesia's economy. As a staple food ingredient, shallots are not only a household necessity but also hold high economic value. The high economic value of shallots is reflected in several aspects [1][2]. First, the selling price of shallots is relatively high compared to other horticultural commodities. Although prices are fluctuating, this commodity can provide significant income for farmers [3][4]. Second, the demand for shallots tends to increase year by year, creating a stable and sustainable market for farmers [5][6]. Third, shallots have diversified uses as a main ingredient in culinary dishes and as a base material in various processed food industries [7][8]. This diversification allows shallots to meet the needs of various market segments, thereby expanding market reach and increasing product-added value. Additionally, shallot production creates a long value chain, from planting, harvesting, and processing, to distribution, all of which contribute to the local and national economies [9][10].

---

\* Corresponding author: [okiwijaya@umy.ac.id](mailto:okiwijaya@umy.ac.id)

In the Special Region of Yogyakarta (DIY), shallots play a crucial role in meeting the food needs of the community and supporting farmers' welfare. This commodity significantly contributes to farmers' income in this area and plays a key role in stabilizing local food supplies [11][12]. Farmers' involvement in shallot cultivation also creates job opportunities and supports the rural economy, making it a vital commodity for daily life and regional economy. The success of farmers in shallot cultivation not only provides direct financial benefits but also encourages the development of more efficient agricultural technologies [13][14]. Good agribusiness practices enhance productivity and farm sustainability, thereby strengthening food security in DIY. Furthermore, successful shallot cultivation can inspire innovation and diversification of other farming businesses, providing a broader positive impact on the agricultural sector and the rural economy in the region. Thus, shallots become an essential commodity in supporting economic and social welfare in DIY [15][16][17].

According to data from the DIY Regional Development Planning Agency (Bappeda DIY), shallot consumption in DIY shows a significantly increasing trend. In 2020, per capita consumption per year reached 2.9 kilograms. This figure increased to 3.2 kilograms per capita per year in 2022 [18]. This increase reflects the high demand for shallots, which are widely used as a primary food ingredient. This high demand certainly provides significant economic opportunities for farmers, as increased consumption can boost shallot sales volumes [19][20][21].

Despite the increasing demand, Bappeda DIY data shows a decline in shallot harvest area in DIY from 2021 to 2022. In 2021, the harvest area was recorded at 3,020.39 hectares, but in 2022 it decreased to 2,439.00 hectares. This decline directly impacted shallot production, which fell from 29,808.66 tons in 2021 to 22,307.00 tons in 2022 [22][23]. The decline in shallot harvest area and production in DIY from 2021 to 2022 can be attributed to several interrelated factors, including the conversion of agricultural land into residential areas, global climate change causing weather variability and increased pests and plant diseases, soil quality degradation, and economic constraints such as high production costs and limited access to capital [24][25][26].

In addition to these challenges, shallot farming also faces various other significant risks. These include pest and disease attacks that can destroy crops, weather uncertainties that result in unstable growing conditions, and the availability of agricultural inputs such as fertilizers and pesticides that are often uncertain or expensive. Moreover, the fluctuation in shallot prices in the market poses a challenge for farmers. Unstable prices make it difficult for farmers to predict income and often result in financial losses. When market prices drop drastically, farmers can face significant financial losses. Conversely, when prices rise, farmers may not be able to maximize their potential profits due to production capacity constraints [27][28][29][30].

The high risks in shallot farming demand strong entrepreneurial characteristics from farmers. Entrepreneurial characteristics, including risk-taking ability, innovation in cultivation, and good business management, are essential to facing challenges and maximizing farm performance [31][32][33]. Farmers with strong entrepreneurial characteristics tend to be more adaptive and capable of making the right decisions in uncertain situations. They tend to be more innovative in applying new agricultural technologies and more efficient cultivation methods, as well as wiser in managing resources and finances [34][35]. Additionally, they are better able to capitalize on market opportunities through product diversification or seeking alternative markets. Thus, strong entrepreneurial characteristics not only help farmers overcome risks and challenges but also enhance the competitiveness and sustainability of shallot farming amidst ever-changing market dynamics [36][34].

Shallot farming in Bantul Regency is of particular interest and importance to study because this area has unique and relevant characteristics for understanding the dynamics of

horticultural agriculture in DIY. Bantul Regency is the area with the highest shallot harvest area in DIY. In 2022, the harvest area in Bantul Regency reached 1,301 hectares, or 53.34 percent of the total harvest area in DIY. Shallot production in Bantul Regency in the same year reached 116,188 quintals, or 52.08 percent of the total DIY production of 223,066 quintals, making it the food basket of DIY. The existence of Bantul Regency as a significant shallot production center highlights the importance of this area in maintaining local food security. Additionally, according to the Bantul Food Security and Agriculture Office, in 2022, there were 546 active farmer groups, reflecting high farmer participation in agricultural activities and strong partnerships among them. In this context, entrepreneurial characteristics become crucial in determining farming success [22][23][12][17].

This research aims to uncover how farmers in Bantul Regency overcome challenges such as climate change, price fluctuations, and issues of access to agricultural inputs through entrepreneurial approaches and analyze how their entrepreneurial characteristics contribute to farm productivity and sustainability. By focusing this research on Bantul Regency, it is hoped that a deep understanding of the factors affecting shallot farming performance can be obtained, as well as effective strategies to enhance the competitiveness and sustainability of the agricultural sector in the region. The results of this research are expected to provide practical recommendations for farmers, policymakers, and other stakeholders in efforts to improve farmer welfare and food security in Bantul Regency and its surroundings. This research is also expected to contribute to the development of entrepreneurship theory in the context of agriculture, as well as support the implementation of more effective and sustainable policies in the horticultural agricultural sector.

## **2 Methodology**

### **2.1 Location and Time**

This study was conducted in Selopamioro Village, Imogiri District, Bantul Regency, Special Region of Yogyakarta. The location was purposively selected because it is the largest producer of shallots in Bantul Regency. The research was carried out in March 2023.

### **2.2 Population and Sample**

The research population comprises all members of farmer groups in Selopamioro Village. The sample was taken using the multistage random sampling method, consisting of two stages: cluster random sampling and proportional random sampling.

#### *2.2.1 Cluster Random Sampling*

Selopamioro Village was divided into two sections: West and East. The West section includes Dusun Kalidadap I, Kalidadap II, Putat, Palemantung, Siluk I, Siluk II, Srunggo I, Srunggo II, and Kajor Kulon. The East section includes Dusun Kajor Wetan, Lenteng I, Lenteng II, Lemah Rubuh, Jetis, Nawungan I, Nawungan II, Kedungjati, and Nogosari.

#### *2.2.2 Proportional Random Sampling*

Samples were taken from each farmer group in both sections proportionally, based on 10% of the total members of each group. The farmer groups involved are Trimartani, Sari Mulyo, Lestari Mulyo, and Sido Rukun (Table 1). The number of samples taken is:

**Table 1.** Proportional Random Sampling

No.	Farmer Group	Population	Sample
1	Trimartani	95	10
2	Sari Mulyo	203	20
3	Lestari Mulyo	221	22
4	Sido Rukun	118	11
<b>Total</b>		<b>637</b>	<b>63</b>

### 2.3 Data Collection Techniques

Primary data was collected through interviews using questionnaires, while secondary data were obtained from literature, journals, and other relevant sources. The questionnaires were used to measure entrepreneurial characteristics and farming performance.

### 2.4 Operational Definitions and Variable Measurement

#### 2.4.1 Entrepreneurial Characteristics

- 1) **Leadership (X1):** The ability to coordinate, pioneer, and take responsibility.
- 2) **Self-Confidence (X2):** The ability to develop potential and belief in success.
- 3) **Risk-Taking (X3):** The ability to understand and take risks in farming.
- 4) **Hard Work (X4):** The attitude of perseverance and discipline in farming.
- 5) **Innovativeness (X5):** The willingness to use modern farming tools and try new varieties.

#### 2.4.2 Farming Performance

- 1) **Sales Volume (Y1):** The ability to meet sales targets and compare results with other farmers.
- 2) **Profit (Y2):** The increase in profits from season to season.

### 2.5 Data Analysis Techniques

Data was analyzed using two main methods: descriptive analysis and Spearman Rank correlation test.

#### 2.5.1 Descriptive Analysis

The Likert scale is used to categorize the level of entrepreneurial characteristics and farming performance into three categories: low, moderate, and high. The interval for each category is determined using the following formula:

$$Interval = \frac{Highest\ score - Lowest\ score}{Number\ of\ Categories} = \frac{5-1}{3} = 1.33 \quad (1)$$

#### 2.5.2 Spearman Rank Correlation Test

Measures the strength of the linear relationship between the performance variable (Y) and the entrepreneurial characteristics variable (X) using the formula:

$$rs = 1 - \frac{6\sum d^2}{n(n^2-1)} \tag{2}$$

Where *rs* is the Spearman Rank correlation coefficient, *d* is the difference between the ranks of variables *Y* and *X*, and *n* is the number of samples.

### 3 Result and Discussion

#### 3.1 Entrepreneurial Characteristics of Farmers

This study shows that the entrepreneurial characteristics of shallots farmers in Selopamiore Village, Imogiri District, Bantul Regency are categorized as moderate, with an overall score of 72.8% (Table 2). The five entrepreneurial indicators analyzed are leadership, self-confidence, risk-taking, hard work, and innovativeness. Leadership reflects the ability of farmers to guide and coordinate their activities effectively. Self-confidence indicates their belief in their abilities to manage and improve their farming practices. Risk-taking demonstrates their willingness to engage in uncertain ventures to achieve better outcomes. Hard work highlights their dedication and persistent effort in managing their farms. Innovativeness showcases their ability to implement new ideas and technologies in farming. These characteristics collectively paint a picture of the entrepreneurial profile of the farmers in this region, providing a foundation for understanding their farming approaches and potential development areas [33][34].

**Table 2.** Results of the Entrepreneurship Characteristics Analysis of Shallot Farmers

No.	Variable	Analysis Results			
		Score	Average	Total	Percentage (%)
<b>Leadership</b>					
1	Coordination Ability	2.5	3.3	9.8	65.3
2	Ability to Be a Pioneer	3.2			
3	Responsible	4.1			
<b>Self-confident</b>					
4	Confident in Making Decisions	3.6	3.6	10.7	71.3
5	Carry out tasks according to plan	3.9			
6	Ability to express opinions	3.3			
<b>Risk Taking</b>					
7	Understanding About Plants	3.9	4.0	12.0	80.0
8	Follow Cultivation Recommendations	3.9			
9	Actively seek opportunities.	4.2			
<b>Hard work</b>					
10	Keep trying.	4.3	4.1	12.3	82.0
11	Punctual	4.4			
12	Don't get satisfied too quickly	3.7			
<b>Innovative</b>					
13	Have the intention to innovate	3.3	3.2	9.5	63.3
14	Utilize farming tools	4.0			
15	Using different types of seed varieties	2.2			
<b>Entrepreneurship Characteristics Score</b>			<b>3.64</b>	<b>54.3</b>	<b>72.8</b>
<b>Category</b>			<b>Medium</b>		

Leadership is one of the important indicators of entrepreneurial characteristics. Farmers in Selopamiore Village show a moderate level of leadership with an average score of 33. This indicator includes the ability to coordinate, pioneer, and take responsibility. The highest score

on the sub-indicator of responsibility demonstrates that farmers have a high commitment to their tasks. Effective leadership is crucial for success in farmer groups, as it enhances coordination and accountability. Strong leadership motivates group members to work harder and fosters a collaborative environment, which is essential for achieving common goals and improving overall performance. The positive impact of leadership on group effectiveness and productivity highlights its importance in the context of agricultural communities [37][38][39].

The self-confidence indicator of shallots farmers in Selopamioro Village is also categorized as moderate, with an average score of 36. The task execution sub-indicator has the highest score, indicating that farmers can effectively carry out the tasks assigned or agreed upon. High self-confidence enhances a farmer's ability to make decisions and tackle challenges. It contributes to improved performance by increasing motivation and persistence when facing obstacles. This level of self-confidence enables farmers to manage their activities more efficiently and adapt to changing circumstances in their farming environment [40][41][42].

The risk-taking attitude of farmers in Selopamioro Village is categorized as high, with an average score of 40. This indicates that farmers are actively seeking business opportunities and are aware of the risks associated with shallots cultivation. Farmers in Selopamioro Village often practice intercropping with other plants such as chili and eggplant to maximize their land's yield. Calculated risk-taking can enhance business success by effectively exploiting market opportunities [43]. Effective risk management is also crucial for improving organizational performance, including in agriculture, allowing farmers to adapt and thrive in a dynamic market environment [44].

The hard work characteristic of shallots farmers in Selopamioro Village is also high, with an average score of 41. Farmers exhibit an unyielding attitude and continue to strive despite experiencing failures in previous seasons. The sub-indicator of continuous effort has the highest score, indicating that farmers have a strong motivation to succeed in shallots farming. Hard work is one of the key factors in entrepreneurial success, with perseverance and high commitment being important predictors in achieving business goals[45]. This dedication ensures that farmers remain resilient and focused on their objectives, contributing to their overall farming performance and success[46].

The innovativeness indicator of farmers in Selopamioro Village is categorized as moderate, with an average score of 32. While many farmers are willing and eager to innovate by using modern farming tools such as rotaries and sprinklers, the adoption of new seed varieties remains low. This is primarily due to limited capital and access to information on cultivation technology. [47] Additionally, innovation significantly impacts organizational performance, including in the agricultural context, enabling farmers to improve their practices and outcomes [48].

Overall, the analysis results indicate that the entrepreneurial characteristics of shallots farmers in Selopamioro Village significantly impact farming performance. Enhancing these characteristics through targeted training and extension programs focusing on leadership, self-confidence, risk-taking, hard work, and innovation is crucial. Such development efforts can enhance the competitiveness and sustainability of the agricultural sector in the area. By fostering these entrepreneurial traits, farmers can improve their business performance, adapt to challenges more effectively, and achieve greater long-term success in their farming endeavors [49].

### 3.2 Shallots Farming Performance

The performance of shallots farming in Selopamioro Village reflects the level of achievement of farmers in running their businesses, as assessed based on sales volume and profit. Based on the analysis results, the farming performance in Selopamioro Village is categorized as moderate, with a total achievement score of 61.33%. The main variable used to measure farming performance is sales volume, which aims to determine the farmers' ability to sell their shallots harvest. The sales volume indicator includes three sub-variables: sales volume meeting the target, increase in sales volume, and comparison of harvest results with other farmers in kilograms (Kg). These results indicate that overall, shallots farmers in Selopamioro Village have a fairly good performance in achieving sales and profit targets, although there is variation among farmers.

The first indicator is the Sales Volume that meets the target. Based on Table 3, this sub-variable has an average score of 3.3, indicating that most farmers in Selopamioro Village can meet their sales targets twice in four growing seasons. This result shows that farmers have a fairly good ability to meet sales targets, although there is variability caused by external factors such as weather conditions and market price fluctuations. Income stability from farming activities is crucial for consistently meeting sales targets[50]. Diversifying income sources through intercropping or additional ventures can help farmers achieve better economic stability and meet their sales targets more reliably [51]. This approach allows farmers to mitigate risks associated with market and environmental uncertainties, ensuring a more stable and predictable income stream[44].

**Table 3.** Results of the Analysis of Shallots Farming Performance

No.	Variable	Analysis Results			
		Score	Average	Total	Percentage (%)
<b>Sales Volume (Kg)</b>					
1	Sales Volume Meets Target	3.3	3.1	9.4	62.66 %
2	Increase in Sales Volume	3.5			
3	Levels of Sales Volume with Other Farmers	2.6			
<b>Profit (IDR)</b>					
4	Results Meet Basic Needs	2.8	2.9	8.7	58.00%
5	Ability to Develop Business	2.2			
6	Increased Sales Results	3.7			
<b>Shallots Farming Performance Score</b>			<b>3.0</b>	<b>18.4</b>	<b>61.33%</b>
<b>Category</b>		<b>Medium</b>			

The second indicator is the increase in sales volume, which has the highest score with an average of 3.5. This score indicates that most farmers have succeeded in increasing their sales volume from season to season. This increase can be attributed to various factors, such as the adoption of better agricultural technology, efficient cultivation practices, and extension support from the government or agricultural institutions. Advanced agricultural technology significantly enhances farmers' productivity and yields [52]. Additionally, better market access and integration with value chains can increase farmers' selling prices and income, directly impacting the increase in sales volume. These improvements enable farmers to optimize their production processes and capitalize on market opportunities, leading to sustained growth in sales volume over time [53].

The third indicator is the sales volume compared to other farmers, which has an average score of 26. This score indicates that although there is an increase in sales volume, many farmers have not yet been able to achieve higher sales volumes compared to their peers. This disparity can be attributed to differences in the application of cultivation techniques, access to agricultural inputs, and variations in farmers' experience and knowledge. Access to credit and capital is crucial for enabling farmers to make necessary investments to enhance productivity and sales volume [54]. Additionally, farmers with better access to financial resources and land can increase their sales volume and achieve higher results [55]. Improving these factors can help bridge the gap and enable more farmers to reach higher sales volumes, thereby improving overall farming performance [56].

Overall, the sales volume indicator shows that although farmers in Selopamioro Village can meet their sales targets and increase their sales volume, there are still challenges that need to be addressed to achieve more consistent performance. Improved access to agricultural technology, training, and continuous support are very important to help farmers better achieve their sales targets and enhance the overall performance of their farming businesses.

Profit is one of the main indicators for measuring farming performance, aiming to determine the level of farmers' success in obtaining profits from their shallot's harvests. This indicator includes three sub-variables: results that meet basic needs, the ability to expand the business, and the increase in sales results in Rupiah (IDR).

The first indicator used to assess farming performance is the ability to meet basic needs. Based on Table 3, this indicator has an average score of 28, indicating that most farmers in Selopamioro Village can meet their basic needs from their shallots farming profits. The profits generated are used to cover daily necessities such as food, education, and health. The ability to meet basic needs is directly related to the income stability obtained from farming activities [57]. Diversifying income sources, such as through intercropping or additional ventures, can help farmers achieve better economic stability, enabling them to consistently meet their basic needs [58]. This approach provides a buffer against market fluctuations and other uncertainties, ensuring that farmers can maintain a stable livelihood.

The second indicator is the ability to expand the business, which has the lowest score with an average of 22. This score reflects that many farmers still face obstacles in expanding the scale of their farming operations. Limited capital and access to additional land are the main barriers faced by farmers in expanding their businesses [59]. Access to credit and capital is crucial for enabling farmers to make the necessary investments to grow their businesses [60]. Additionally, farmers with better access to financial resources and land are generally more capable of expanding their operations and increasing productivity.

The third indicator is the increase in sales results, which has the highest score with an average of 37. This score indicates that most farmers have experienced an increase in sales results at least once in the last four seasons. Improvements in cultivation techniques, the use of superior seed varieties, and favorable weather conditions often contribute to this increase in sales [61]. The adoption of better agricultural technology can significantly enhance farmers' productivity and yields. Moreover, better market access and integration with value chains can lead to higher selling prices and increased income for farmers. These advancements enable farmers to achieve better sales results and enhance their overall farming performance.

Nawungan I hamlet shows the highest profit score with an average score of 32, reflecting that farmers in this hamlet have good performance in terms of increasing sales results and the ability to meet basic needs. Farmers in Nawungan I tend to be more consistent in achieving higher sales results and have plans to expand their land, indicating great potential for increased profits in the future. On the other hand, Kalidadap I hamlet has the lowest profit score with an average score of 21. This is due to various cultivation problems, such as low

knowledge about the use of pesticides and fertilizers, as well as the suboptimal role of farmer groups, which affect farmers' yields and profits.

Overall, the profit indicator shows that although farmers in Selopamioro Village can meet their basic needs and increase their sales results, there are still significant challenges in expanding their businesses. Improving access to capital, land, and better cultivation technology is very important to help farmers overcome these barriers and improve their overall farming performance. Efforts to improve business management skills and ongoing extension services are also needed to support the development of more productive and sustainable farming businesses [62].

### 3.3 The Relationship Between Entrepreneurial Characteristics and Shallots Farming Performance

The relationship between entrepreneurial characteristics and the performance of shallots farming in Selopamioro Village was analyzed using the Rank Spearman correlation test (Table 4). The entrepreneurial characteristics analyzed include leadership, self-confidence, risk-taking, hard work, and innovativeness. The performance of the farming business was measured based on two main indicators: sales volume and profit. The correlation test results provide insights into how strongly entrepreneurial characteristics influence farming performance.

**Table 4.** Correlation Test Results of Entrepreneurship Characteristics with Shallot Farming Performance

Farming Performance	Characteristics of Entrepreneurship				
	Leadership	Self-confident	Risk Taking	Hard work	Innovative
Sales Volume	0.155	0.235	0.222	0.218	0.367**
Profit	0.282*	0.218	0.320*	0.136	0.330**

Notes:

\*Significant at  $\alpha=5\%$  (significantly correlated at the 5% significance level)

\*\*Significant at  $\alpha=10\%$  (significantly correlated at the 10% significance level)

The analysis results indicate that leadership has a positive but not significant correlation with sales volume, with a correlation coefficient of 0.155. Although an increase in leadership is expected to enhance sales volume, this relationship is not strong enough to be considered significant. However, leadership does show a positive and significant correlation with profit, with a correlation coefficient of 0.282 at the 5% significance level. This suggests that better leadership abilities can indeed increase farmers' profits.

Self-confidence also shows a positive but not significant correlation with sales volume, with a correlation coefficient of 0.235. This indicates a positive relationship between the farmers' level of self-confidence and sales volume, but the relationship is not strong enough to be considered significant. Similarly, self-confidence has a positive but not significant correlation with profit, with a correlation coefficient of 0.218. These results imply that while self-confidence is important, its effect on farming performance is not substantial without the support of technical skills and adequate resources.

Risk-taking has a positive but not significant correlation with sales volume, with a correlation coefficient of 0.222. However, it has a positive and significant correlation with profit, with a correlation coefficient of 0.320 at the 5% significance level. This indicates that farmers who are more willing to take risks tend to achieve higher profits, particularly when making decisions such as adopting new technologies or expanding their land.

Hard work shows a positive but not significant correlation with sales volume, with a correlation coefficient of 0.218, and also a positive but not significant correlation with profit,

with a correlation coefficient of 0.136. This suggests that while hard work is positively related to farming performance, this relationship is not strong enough to be considered significant. Effective farming success requires not just hard work but also good management strategies.

Innovativeness shows a positive and significant correlation with sales volume, with a correlation coefficient of 0.367 at the 10% significance level. This indicates that innovation in cultivation practices and the use of modern technology can indeed increase sales volume. Innovativeness also has a positive and significant correlation with profit, with a correlation coefficient of 0.330 at the 10% significance level. These results demonstrate that more innovative farmers tend to achieve higher profits, emphasizing the importance of adopting new technologies and innovative methods in cultivation to achieve better results.

Overall, entrepreneurial characteristics have a positive correlation with the performance of shallots farming. Significant correlations were found between leadership and profit, risk-taking and profit, and innovativeness with both sales volume and profit. Although most relationships fall into the weak category, these results suggest that improving farming performance does not solely depend on entrepreneurial characteristics but also requires support from other factors such as access to resources, technology, and external assistance. Effective farming strategies must integrate these elements to optimize performance and achieve sustainable success.

## 4 Conclusion and Recommendation

### 4.1 Conclusion

This study examined the relationship between entrepreneurial characteristics and the performance of shallots farming in Selopamioro Village, Imogiri District, Bantul Regency. The results showed that the entrepreneurial characteristics of farmers, including leadership, self-confidence, risk-taking, hard work, and innovativeness, play a significant role in influencing farming performance. Specifically, leadership and innovation had a positive and significant correlation with both sales volume and profit. Risk-taking also showed a significant positive correlation with profit. Overall, the findings indicate that entrepreneurial characteristics positively impact the success of shallots farming, suggesting that enhancing these traits can lead to better farming outcomes.

### 4.2 Recommendation

1. **Training and Development Programs:** Implement targeted training and development programs to enhance farmers' entrepreneurial characteristics, particularly focusing on leadership, self-confidence, risk-taking, hard work, and innovativeness. Such programs can be conducted through workshops, seminars, and extension services.
2. **Access to Resources:** Improve farmers' access to critical resources such as modern farming technologies, high-quality seeds, fertilizers, and financial services. Providing better access to these resources can help farmers implement innovative practices and improve their farming performance.
3. **Supportive Policies:** Develop and implement supportive agricultural policies that encourage entrepreneurial activities among farmers. This includes providing subsidies for modern farming equipment, offering low-interest loans, and creating a favorable market environment for shallots farmers.
4. **Extension Services:** Strengthen agricultural extension services to provide continuous support and guidance to farmers. Extension workers can play a vital role in disseminating information about best practices, new technologies, and market opportunities.

5. **Collaboration and Networking:** Promote collaboration and networking among farmers, agricultural institutions, and stakeholders. Encouraging farmers to join farmer groups or cooperatives can facilitate knowledge sharing, collective problem-solving, and access to larger markets.

## References

1. T. K. Manik, P. B. Timotiwu, and M. Mua'ddin, *Sains Tanah - Journal of Soil Science and Agroclimatology* 20, 100 (2023).
2. Y. Surdianto, A. Nurawan, N. Sutrisna, Wiratno, H. Susanto, K. K. Hamdani, and N. An. Nadjib, *IOP Conf Ser Earth Environ Sci* 1177, 012002 (2023).
3. E. Suminartika, Y. Deliana, H. Hapsari, and S. Fatimah, *IOP Conf Ser Earth Environ Sci* 1107, 012110 (2022).
4. J. A. Purba, T. Supriana, and Y. Maryunianta, in *IOP Conf Ser Earth Environ Sci* (IOP Publishing Ltd, 2021).
5. D. Fajarika, R. U. Fahadha, I. Mardiono, and N. Miswari, *Journal of Science and Application Technology* 2, (2019).
6. S. Basuki, M. Eti Wulanjari, Komalawati, and D. Sahara, *E3S Web of Conferences* 316, 02004 (2021).
7. A. Suciati, S. Sumadi, and A. Djamali, *Jurnal Agrinika : Jurnal Agroteknologi Dan Agribisnis* 6, 96 (2022).
8. S. D. Indrasari, D. Arofah, Kristamtini, Sudarmaji, and D. D. Handoko, *IOP Conf Ser Earth Environ Sci* 746, 012009 (2021).
9. R. Dewayanti, Irham, and H. Perwitasari, *IOP Conf Ser Earth Environ Sci* 1005, 012027 (2022).
10. M. A. Fattah, S. Mardiyati, and F. Firmansyah, *AgriMu* 2, (2022).
11. D. R. Kamardiani and R. L. Pratama, *Mimbar Agribisnis: Jurnal Pemikiran Masyarakat Ilmiah Berwawasan Agribisnis* 8, 1515 (2022).
12. D. V Torani, A. Suryantini, and Irham, *IOP Conf Ser Earth Environ Sci* 1005, 012028 (2022).
13. Darmono, K. Ma'ruf, Y. A. Fadullah, B. P. Setiyawan, and Surono, *East Asian Journal of Multidisciplinary Research* 2, 2363 (2023).
14. Hanif Gusrianto, Zulvera, and Sri Wahyuni, *Jurnal Niara* 16, 167 (2023).
15. H. Cahyaningrum, Y. Saleh, S. Hartanto, and M. D. Pertiwi, *E3S Web of Conferences* 373, 03008 (2023).
16. R. R. Ashrit and M. K. Thakur, *SN Social Sciences* 1, 218 (2021).
17. S. Suharni, L. R. Waluyati, and J. Jamhari, *Agro Ekonomi* 28, 48 (2017).
18. Badan Perencanaan Pembangunan Daerah Istimewa Yogyakarta, *Aplikasi Dataku Daerah Istimewa Yogyakarta (Elemen Konsumsi)* (Yogyakarta, 2024).
19. Y. Surdianto, A. Nurawan, N. Sutrisna, Wiratno, H. Susanto, K. K. Hamdani, and N. An. Nadjib, *IOP Conf Ser Earth Environ Sci* 1177, 012002 (2023).
20. Y. D. Astanti, R. N. Putri, and L. Nafisah, *OPSI* 15, 1 (2022).
21. T. S. Gumilar, M. Maswadi, W. Fitrianti, E. Yurisinthae, and A. Suharyani, *E3S Web of Conferences* 373, 04027 (2023).

22. Badan Pusat Statistik Daerah Istimewa Yogyakarta, Statistik Hortikultura Daerah Istimewa Yogyakarta 2022 (Yogyakarta, 2023).
23. Badan Perencanaan Pembangunan Daerah Istimewa Yogyakarta, Aplikasi Dataku Daerah Istimewa Yogyakarta (Elemen Hortikultura) (Yogyakarta, 2024).
24. M. Achmad, *Journal of the Community Development in Asia* 7, 14 (2024).
25. R. Parmawati, R. Hardyansah, and A. Rahmawati, *Journal of Socioeconomics and Development* 4, 46 (2021).
26. Sriyadi, N. Hanifah, B. Heri Isnawan, Budiarto, and N. R. Wan Ibrahim, *E3S Web of Conferences* 444, 02040 (2023).
27. D. Dinakaran, G. Gajendran, S. Mohankumar, G. Karthikeyan, S. Thiruvudainambi, E. I. Jonathan, R. Samiyappan, D. G. Pfeiffer, E. G. Rajotte, G. W. Norton, S. Miller, and R. Muniappan, *J Integr Pest Manag* 4, 1 (2013).
28. M. A. Girsang, P. Nainggolan, S. Hidayat, S. Sitepu, and K. El Ramija, *IOP Conf Ser Earth Environ Sci* 819, 012006 (2021).
29. Triyono, M. Fauzan, J. Mu'awanah, and M. Sedek, *E3S Web of Conferences* 316, 02036 (2021).
30. Triyono and H. Sulistyaningsih, *E3S Web of Conferences* 316, 02054 (2021).
31. Puspitasari, A. M. Kiloes, S. Prabawati, and R. Setiani, *IOP Conf Ser Earth Environ Sci* 1063, 012038 (2022).
32. Darmono, K. Ma'ruf, Y. A. Fadullah, B. P. Setiyawan, and Surono, *East Asian Journal of Multidisciplinary Research* 2, 2363 (2023).
33. T. Buddhi Satyarini, T. Fujiwara, and A. Berlian Octiva, *E3S Web of Conferences* 444, 02042 (2023).
34. D. Kahan and Food and Agriculture Organization of the United Nations., *Entrepreneurship in Farming* (n.d.).
35. D. Zhou and L. Li, *Front Psychol* 13, (2022).
36. Saptana, E. Gunawan, A. D. Perwita, S. G. Sukmaya, V. Darwis, E. Ariningsih, and Ashari, *PLoS One* 16, e0256832 (2021).
37. S. Waqingah, Irham, and J. H. Mulyo, *IOP Conf Ser Earth Environ Sci* 1005, 012018 (2022).
38. A. S. Herianto, I. Gede Suparta, M. E. Pranasari, V. Chessy, F. Arief, and P. Yudono, *An Assessment of Peoples' Livelihoods in Yogyakarta and Central Java Provinces Pre-and Post-Disaster* (n.d.).
39. T. W. Utami, Irham, and I. Abdurofi, *IOP Conf Ser Earth Environ Sci* 1005, 012029 (2022).
40. C. Nicholson, J. Long, D. England, B. Long, Z. Creelman, B. Mudge, and D. Cornish, *Farm Decision Making: The Interaction of Personality, Farm and Risk to Make More Informed Decisions, Revised Edition* (The Grains Research and Development Corporation (GRDC), Kingston, 2020).
41. M. van Sommeren, *The Influence of a Farmers' Self-Identity on the Decision-Making about Adopting Technological Innovations*. (2019).
42. J. P. Taramuel-Taramuel, I. A. Montoya-Restrepo, and D. Barrios, *Heliyon* 9, e20820 (2023).
43. D. Viscott, (2013).
44. The U.S. Department of Agriculture (USDA), *Agricultural Outlook I* (2000).

45. Q. Shaowei, L. Tianhua, and Z. Miao, *Front Psychol* 13, (2022).
46. R. Maltou and Y. T. Bahta, *Jàmbá Journal of Disaster Risk Studies* 11, (2019).
47. S. D. Satyanarayana, G. Daniel Risheen Assistant Professor, and G. Daniel Risheen, ~ 22 ~ *International Journal of Veterinary Sciences and Animal Husbandry* 8, 22 (2023).
48. J. Kang and M. Zhao, *Comput Intell Neurosci* 2022, 1 (2022).
49. E. Fuetsch, *Journal of Small Business Strategy* 32, (2022).
50. R. Kata and M. Leszczyńska, *Agriculture* 11, 1296 (2021).
51. T. M. Ha, G. Manevska-Tasevska, O. Jäck, M. Weih, and H. Hansson, *Int J Agric Sustain* 21, (2023).
52. P. V. Méndez-Zambrano, L. P. Tierra Pérez, R. E. Ureta Valdez, and Á. P. Flores Orozco, *Sustainability* 15, 16100 (2023).
53. J. H. Hanf and T. Gagalyuk, in *Agricultural Value Chain (InTech, 2018)*.
54. A. A. Chandio, Y. Jiang, A. Rehman, M. A. Twumasi, A. G. Pathan, and M. Mohsin, *Journal of Asian Business and Economic Studies* 28, 225 (2021).
55. Seluhinga N.S., *Tanzania Journal of Agricultural Sciences* 22, 434 (2023).
56. P. Thakur, P. Mehta, C. Devi, P. Sharma, K. K. Singh, S. Yadav, P. Lal, Y. S. Raghav, P. Kapoor, and P. Mishra, *Front Sustain Food Syst* 7, (2023).
57. G. Angermayr, A. Palacio, and C. Chaminade, *Sustainability* 15, 15439 (2023).
58. K. Waha, M. T. van Wijk, S. Fritz, L. See, P. K. Thornton, J. Wichern, and M. Herrero, *Glob Chang Biol* 24, 3390 (2018).
59. W. K. Korthals Altes, *Sustainability* 15, 5097 (2023).
60. A. Ullah, N. Mahmood, A. Zeb, and H. Kächele, *Agriculture* 10, 586 (2020).
61. N. M. D. Resiani, N. P. Sutami, and A. A. N. B. Kamandalu, *IOP Conf Ser Earth Environ Sci* 1172, 012033 (2023).
62. D. Kahan, *The Role of the Farm Management Specialist in Extension*, 1st ed. (Food and Agriculture Organization of The United Nations, Rome, 2013).