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The Effect of Individual Characteristics and Entrepreneurship on Rice Farming Performance

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ABSTRACT

Entrepreneurship in the agricultural sector produces creative, innovative, and independent farmers who can improve farm performance. Therefore, this research aimed to determine the impact of individual characteristics and entrepreneurship on rice farming performance. The method employed in this research was a descriptive method to provide a qualitative description of individual characteristics and entrepreneurship in the performance of rice farming. The research was executed in one of the rice-producing centers in Kubu Raya Regency, West Kalimantan. The simple random sampling method was used in selecting farmers with 150 respondents selected as the sample size. Furthermore, the research variables involved were individual characteristics, farmer's entrepreneurship, and rice farming performance. Data were collected using questionnaires, interviews, and observations, and analysis was performed using Structural Equation Modeling (SEM) with SMART-PLS software. The results showed that individual characteristics and entrepreneurship had a significant and positive effect on rice farming performance. Consequently, it can be concluded to improve rice farming performance, farmers suggested strengthening their characteristics, particularly those related to farming motivation, and enhancing their entrepreneurial characteristics through their task and outcome-oriented behavior.

Keywords: Individual characteristics; Farmer's entrepreneurship; Rice farming performance

INTRODUCTION

Farmers' competence and entrepreneurial skills are required for the development of the agricultural sector (Pindado, Sánchez, Verstegen, & Lans, 2018) and to achieve development in information technology. Entrepreneurship is an essential factor that influences farmers in improving farm productivity and market access for agricultural development (Opolot, Isubikal, Obaa, & Ebanyat, 2018). In addition, a creative attitude, risk-taking, hard work, resource utilization, and the ability to identify business opportunities are all entrepreneurial behaviors.

According to several studies, farmer's entrepreneurship is essential in determining the success of a business, therefore, entrepreneurial skills need to be improved to tackle challenges in the business environment (Deka & Goswami, 2020; Dias, Rodrigues, & Ferreira, 2019; Fitz-Koch, Nordqvist, Carter, & Hunter, 2018; Nukpezah & Blankson, 2017). The barriers to becoming an entrepreneur are higher in the farm sector than in other sectors (Pindado et al., 2018) and the development of entrepreneurial skills alleviates poverty in rural areas (Lin, Winkler, Wang, & Chen, 2020; Liu, He, & Turvey, 2021; Naminse & Zhuang, 2018; Nukpezah & Blankson, 2017; Si, Ahlstrom, Wei, & Cullen, 2020). Therefore, farmers can develop their entrepreneurial skills by registering for entrepreneurship training and obtaining credit loans. Farmers who are interested in improving their entrepreneurship skills are willing to pay more (Pliakoura, Beligiannis, & Kontogeorgos, 2020).

Mostly, farmers have a low level of formal and informal education which may contribute to their poor farming performance. In addition, the level of farmers' participation in extension services is low and improving farm performance will be hampered by the lack of motivation and entrepreneurial skills. Conversely, farmers who have entrepreneurial skills are willing to adopt modern technology and equipment. They also overcome risks and uncertainties in the agricultural sector.

Several studies have shown that entrepreneurship can increase farm diversification (Yoshida, Yagi, & Garrod, 2020), farmers' innovation (Barzola Iza & Dentoni, 2020), promote farm activities (Deka & Goswami, 2020), productivity, creativity, and business orientation. Entrepreneurship is an essential aspect of a nation's economy that drives the economic growth and development. As a result, the increasing of entrepreneurship rises the economic growth (Ratten, 2018).

The government is always interested to improve farming performance; therefore, the best action is required to develop the agricultural sector and enhance farmers' entrepreneurial skills (Dobryagina, 2020). All this time, the governments' focus has been more on the on-farm approach to increasing farm productivity. Studies on farmers' internal conditions, especially farmer's entrepreneurship, have not been analyzed to support farm performance success. Therefore, research on the effect of individual characteristics and farmer's entrepreneurship on rice farming performance is required. This research was expected to contribute information about the role of farmer's entrepreneurship in improving the performance of rice farming, namely increasing farm productivity, market expansion, and farmers' competitiveness.

RESEARCH METHOD

The principal method used in this research was a descriptive method for gathering necessary information, identifying problems, evaluating, and determining future decisions. In this research, a descriptive approach was used to provide a qualitative description of rice farming entrepreneurship characteristics and performance. The research was carried out in one of the rice-producing centers in Kubu Raya Regency, West Kalimantan. In 2019, the rice harvesting area in the Kubu Raya Regency was 39,017.30 ha, with a yield of 116,454.98 tons.

Rice farming spread in several regions in Kubu Raya Regency with the highest production in Sungai Kakap District, Batu Ampar District, and Kubu District contributing 39.07%, 16.96%, and 14.38% of total rice production in Kubu Raya Regency respectively.

Questionnaires and interviews with farmers were performed to collect primary data which include individual characteristics (X1), farmer's entrepreneurship (X2), and rice farming performance (Y). The number of samples was determined using the Hair formula because the population size was unknown. Furthermore, Hair, Black, Blac, Babin, & Anderson (2010) stated that the minimum sample ratio is 10:1, meaning that a minimum of 10 samples is required for each independent variable studied. The sample size was determined by multiplying the number of indicators by 10 resulting in 150 respondents, and determination of the sample was done using a simple random sampling method.

Descriptive analysis was used to qualitatively describe the individual characteristics and entrepreneurship of rice farming in Kubu Raya Regency. Individual characteristics of farmers include education, farming experience, motivation, perceptions, and desire to do business. Farmer's entrepreneurship characteristics namely future-oriented, task and outcome-oriented, innovative, self-confident, hard-workers, risk-takers, and independent. Rice farming performances include increased farm productivity, market expansion, and competitive ability.

The data was quantified using a Likert scale ranging from very good (score 5), good (score 4), average (score 3), bad (score 2) to very bad (score 1). The effect of individual characteristics and entrepreneurship on rice farming performance was analyzed using SEM with SMART-PLS software. The hypothesis proposed in this study states that Individual characteristics (X1) and entrepreneurial characteristics (X2) have a significant effect on rice farming performance (Y) in Kubu Raya Regency.

RESULT AND DISCUSSIONS

Individual Characteristics and Farmer's Entrepreneurship

The descriptive analysis of individual characteristics and entrepreneurship on rice farming performance are presented in Table 1.

According to Table 1, the overall individual characteristics of rice farmers were in a good category. This means that farmers have a good education, farming experience, farming motivation, perception, and desire to do business. Furthermore, highly motivated and educated farmers have a better chance of increasing farming productivity and performance (Paltasingh & Goyari, 2018) while experienced farmers find it easier to farm and implement strategies that improve farm performance. Farmers' perceptions of how farming was implemented include counselling activities, technological innovation features, and information media that affect farming performance.

The overall entrepreneurial characteristics of rice farmers were in a good category. This indicates that farmers were good future-oriented, task and outcome oriented, innovative, self-confident, hard workers, risk-takers, and independent. Farm entrepreneurship and entrepreneurial skills can improve farm management (Mcekwee, 2006) and are also perceived

as the best strategy to alleviate poverty (Díaz-Pichardo, Cantú-González, López-Hernández, & McElwee, 2012). The overall rice farming performance was in a good category which means that farmers can increase farm productivity, market expansion, and competitive ability.

TABLE 1. INDIVIDUAL CHARACTERISTICS, FARMER’S ENTREPRENEURSHIP AND RICE FARMING PERFORMANCE IN KUBU RAYA REGENCY

Measurement Indicator	Respondent Answers (%)				
	5 very good	4 good	3 average	2 bad	1 very bad
Individual Characteristics (X1)					
Farmer’s education (X1.1)	21	49	22	7	1
Farming experience (X1.2)	13	39	27	21	0
Farming motivation (X1.3)	31	54	12	3	0
Farmer’s perceptions (X1.4)	36	53	8	3	0
Farmer’s desire to do business (X1.5)	18	66	14	2	0
Farmer’s Entrepreneurship (X2)					
Future-oriented (X2.1)	17	44	21	13	5
Task and outcome-oriented (X2.2)	14	55	21	10	0
Innovative (X2.3)	17	54	27	2	0
Self-confident (X2.4)	20	55	23	2	0
Hard worker (X2.5)	6	41	38	14	1
Risk-taker (X2.6)	9	53	30	7	1
Independent (X2.7)	7	42	37	14	0
Rice Farming Performance (Y)					
Increased farm productivity (Y1)	10	55	32	3	0
Market expansion (Y2)	9	50	34	7	0
Competitive ability (Y3)	9	36	30	25	0

Effect of individual characteristics and entrepreneurship on rice farming performance

Preliminary Research Model

The effect of farmers’ characteristics and entrepreneurial characteristics on farm performance was analyzed using SEM PLS (Structural Equation Model Partial Least Square). This model consists of two exogenous latent variables, namely individual characteristics (X1) and farmer’s entrepreneurship (X2), and one endogenous latent variable, rice farming performance (Y).

Evaluation of the Measurement Model (Outer Model)

This evaluation aimed to ensure that each construct and indicator used was proven reliable and valid by examining the convergent and discriminant validity. Convergent validity uses three measurements, namely (i) standardized loading factor, (ii) Composite Reliability (CR), and (iii) Average Variance Extracted (AVE). The results of the SEM PLS model analysis are described in Figure 1.

The standardized loading factor shows the magnitude of the correlation between the indicator item and the construct with the loading factor value ≥ 0.5 considered valid. Based on the PLS results (Figure 1), all indicators were valid with a loading factor value ≥ 0.5 , which shows that all indicators had a strong correlation with the construct. Subsequently, the next

step was to ensure that Composite Reliability (CR) and Average Variance Extract (AVE) values meet the criteria if CR is above 0.7 and AVE is above 0.

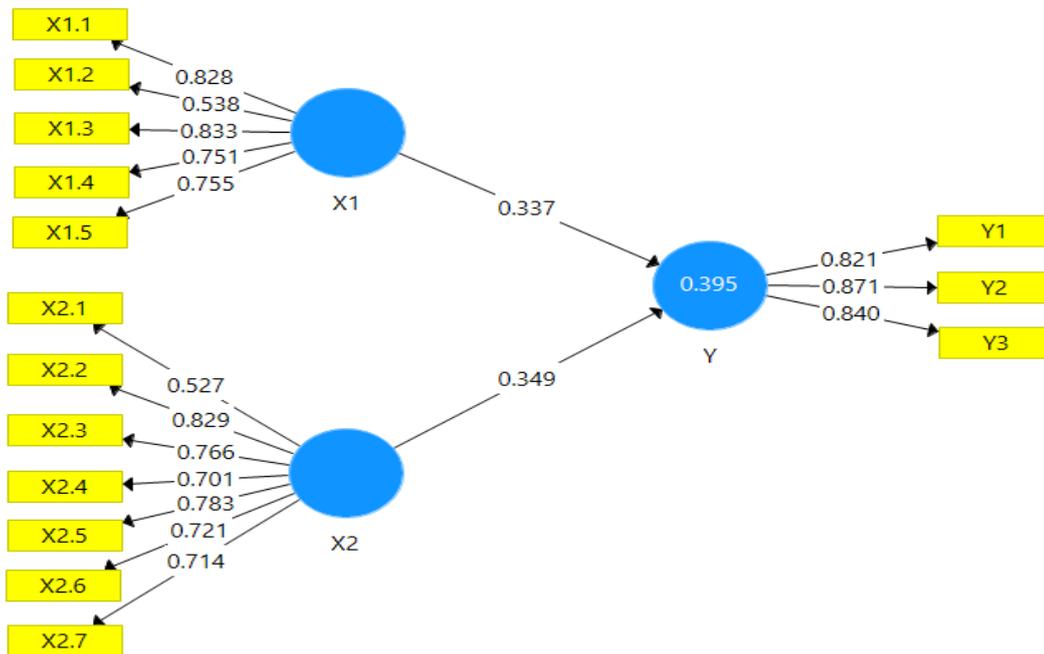


FIGURE 1. SEM PLS RESULT ANALYSIS OF INDIVIDUAL CHARACTERISTICS AND ENTREPRENEURSHIP EFFECT ON RICE FARMING PERFORMANCE IN KUBU RAYA REGENCY

Table 2 shows that all the CR values of the construct were satisfactory, which means that the indicators consistently measure the construct. The AVE value indicates the best measure of convergent validity, meaning that the construct variable can explain most of the indicators' variants.

TABLE 2. CONSTRUCTIVE RELIABILITY TEST OF INDIVIDUAL CHARACTERISTICS, FARMER'S ENTREPRENEURSHIP AND RICE FARMING PERFORMANCE IN KUBU RAYA REGENCY

Construct	AVE	Composite Reliability	Cronbach's Alpha
X1 (Individual Characteristics)	0.560	0.862	0.801
X2 (Entrepreneurship Characteristics)	0.526	0.885	0.847
Y (Rice Farming Performance)	0.713	0.882	0.799

The following construct reliability test was to evaluate the discriminant validity by examining cross-loading and comparing the AVE root value with an inter-construct conversion. Table 3 shows the cross-loading values and illustrates that almost all indicators had a higher value with each construct than the coefficient value of the indicators in the construction block in the other column. As a result, each indicator in the block serves as the constructor of the construct in the column.

The next check proves that the square root of AVE for each construct was higher than its correlation with other constructs. Based on Table 4, the square root of AVE and correlation between constructs can explain that the root of AVE for construct X1 (individual characteristics) is 0.748, while the maximum correlation of X1 with other constructs is 0.677, therefore, the square root of AVE construct X1 was higher than the value of the correlation

of other constructs. This value shows that other discriminant validity requirements were fit. Other constructs also show that the square root of AVE was higher than its correlation construct.

TABLE 3. CROSS LOADING OF INDIVIDUAL CHARACTERISTICS, FARMER'S ENTREPRENEURSHIP AND RICE FARMING PERFORMANCE IN KUBU RAYA REGENCY

	X1	X2	Y
Farmer education (X1.1)	0.828	0.607	0.498
Farming experience (X1.2)	0.538	0.356	0.275
Farming motivation (X1.3)	0.833	0.616	0.475
Farmer perceptions (X1.4)	0.751	0.446	0.306
Farmer desire to do farm business (X1.5)	0.755	0.458	0.505
Future-oriented (X2.1)	0.357	0.527	0.260
Task and outcome-oriented (X2.2)	0.671	0.829	0.500
Innovative (X2.3)	0.637	0.766	0.391
Self-confidence (X2.4)	0.680	0.701	0.361
Hard work (X2.5)	0.373	0.783	0.483
Risk-lovers (X2.6)	0.401	0.721	0.453
Independent (X2.7)	0.340	0.714	0.423
Increased farm productivity (Y1)	0.531	0.488	0.821
Market expansion (Y2)	0.489	0.535	0.871
Competitive ability (Y3)	0.422	0.430	0.840

TABLE 4. THE SQUARE ROOT OF AVE AND CORRELATION BETWEEN THE INDIVIDUAL CHARACTERISTICS, FARMER'S ENTREPRENEURSHIP AND RICE FARMING PERFORMANCE IN KUBU RAYA REGENCY

Variable Construct	Square Root of AVE	Correlation between constructs		
		X1	X2	Y
X1 (Individual Characteristics)	0.748	1.000	0.677	0.573
X2 (Entrepreneurship Characteristics)	0.725	0.677	1.000	0.577
Y (Rice Farming Performance)	0.844	0.573	0.577	1.000

Inner Model (Structural Model)

The first step was to observe the significance of the relationship between constructs which was deduced from (i) R2 value, (ii) path coefficient, and (iii) t-statistics. The value of R² for the construct "Rice Farming Performance" was 0.395 indicating that the rice farming performance variables that the individual characteristics and farmer's entrepreneurship account for is 39.5%, with the rest explained by other factors outside this model. Subsequently, the value of the path coefficient and t-statistics of each construct was tested. According to Table 5, it was observed that individual characteristics and farmer's entrepreneurship affect rice farming performance. Furthermore, individual characteristics variables were significant and had a positive effect on rice farming performance. This was deduced from the value of the "path coefficient" which was 0.337. The value of "T statistics" was 3.373, with a "P-value" of 0.001. Farmer's entrepreneurship variables were also significant and had a positive effect on rice farming performance; this can be seen from the value of the "path coefficient" which was 0.349. The value of "T statistics" was 3.199, with a "P-value" equal to 0.002.

TABLE 5. PATH COEFFICIENTS OF INDIVIDUAL CHARACTERISTICS AND ENTREPRENEURSHIP EFFECT ON RICE FARMING PERFORMANCE IN KUBU RAYA REGENCY

	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values
X1 → Y	0.337	0.349	0.100	3.373	0.001*
X2 → Y	0.349	0.339	0.109	3.199	0.002*

DF = N - K (150 - 3 = 147), N = sample, K = variable (construct)

*significant at the 1% level

Effect of Individual Characteristics on The Rice Farming Performance

The results showed that the farmers' characteristics increase rice farming performance. This indicates that the better characteristics of farmer such as education, farming experience, farming motivation, farmers' perceptions, and desire to do farm business will improve the farm performance. Furthermore, formal, and informal farmers' education plays a role in increasing productivity, profits, and farm household performance (Paltasingh & Goyari, 2018; Rahman, Nielsen, Khan, & Ankamah-Yeboah, 2020). Educated farmers can improve entrepreneurship behavior (Khokhar, 2019; Pindado et al., 2018), influencing the farmers risk attitude (Ahmad, Afzal, & Rauf, 2019; Fahad & Wang, 2018; Meraner & Finger, 2019) and risk management adoption (Adnan et al., 2021; Thi Lan Huong, Shun Bo, & Fahad, 2017).

Farmers' experience has a positive effect on increase in farm productivity and performance (Rahman et al., 2020; Ume, Enete, Onyekuru, & Oyata, 2020), determining farmer risk attitude (Ahmad et al., 2019), and increasing the adoption of risk strategy (Thi Lan Huong et al., 2017). The role of farmers' motivation increases sustainable agricultural practices (Bopp, Engler, Poortvliet, & Jara-Rojas, 2019; Hammond et al., 2017; Jambo, Groot, Descheemaeker, Bekunda, & Tittonell, 2019; Mellon-Bedi, Descheemaeker, Hundie-Kotu, Frimpong, & Groot, 2020), especially for financial motivation, which can increase agricultural entrepreneurship (Dobryagina, 2020). Farmers' perception is also essential however, even if the farmer does not have good perceptions, it does not prevent the farmer from becoming an entrepreneur (Arafat, Saleem, Dwivedi, & Khan, 2020).

Based on the analysis results, the variable of farming motivation (X1.3 = 0.833) plays the dominant role in constructing individual farmer characteristics, which means that if farmers had better farming motivation, they can improve their rice farming performance. In other words, farmers must increase their farming motivation so that it is easy for the farmer to absorb information and technological developments, leading to improved rice farming performance.

Effect of Farmer's Entrepreneurship on The Rice Farming Performance

The analysis results described that the farmer's entrepreneurship characteristics had a positive effect on rice farming performance. This indicates that the better entrepreneurial characteristics of farmer such as future-oriented, task and outcome-oriented, innovative, self-confident, hard worker, risk-taker, and independent will improve rice farming performance. This result was in line with several other research that show farmer's entrepreneurship behavior can affect farming performance (Hassink, Hulsink, & Grin, 2016; Morris, Henley,

& Dowell, 2017; Yessoufou, Blok, & Omta, 2018). Furthermore, self-confidence, optimism, hope, and resilience are characteristics to measure psychological capital that affect entrepreneurship development (Chipfupa & Wale, 2018). Farmers' courage in taking risks and their orientation in their tasks and results are characteristics that build entrepreneurship behavior in farmers (Asmit & Koesrindartoto, 2015; Deka & Goswami, 2020). Future-oriented, confident, and innovative attitudes also develop farmers' entrepreneurship behavior (Asmit & Koesrindartoto, 2015; Deka & Goswami, 2020; Jia & Desa, 2020). Task, relations, and change-oriented is positively related to entrepreneurship (Demircioglu & Chowdhury, 2021).

Farms with greater risk and larger farm capital generally require higher farmer's entrepreneurship to optimize their farm performance. Even if the farmer is risk-averse, it will encourage the farmer to become an entrepreneur (Hsieh, Parker, & van Praag, 2017). Entrepreneurial behavior is essential in the field of farming and agribusiness (Ume et al., 2020), agro-tourism (Yuan, Liu, Ju, & Li, 2017), and SME activities (Alzaghal & Mukhtar, 2017; Auwal, Mohamed, Shamsudin, Sharifuddin, & Ali, 2020) and it is reflected by a proactive attitude, results-oriented, and commitment to facing competitors. Based on the analysis results, the task and outcome-oriented variables ($X_{2.2} = 0.829$) play the most dominant role in constructing farmer's entrepreneurship. This shows that the farmer's better task and outcome-oriented performance will improve the rice farming performance. Furthermore, the entrepreneurial character of job-oriented farmers and optimism about the results will have a positive influence on improving the performance of rice farming.

CONCLUSION

Individual characteristics and entrepreneurship had a significant and positive influence on rice farming performance; this indicates that if individual characteristics and farmer's entrepreneurship were improved, there will be an enhancement in the rice farming performance. Therefore, farmers can increase rice farming performance by improving individual characteristics, mostly related to farming motivation and entrepreneurial skills, through a task and outcome-oriented behavior. The government plays an essential role in enhancing rice farming performance through non-formal education, counseling, mentoring, and entrepreneurial training. Furthermore, recommendations for further research include utilizing a larger sample size to improve the model and adding other variables related to individual characteristics and farmer's entrepreneurship to determine the most suitable model for rice farming performance.

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analyzed data, draft and editing the article. MA: collected data, analyzed data, draft and editing the article.

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