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Analysis of Farmers' Entrepreneurial Behavior and Its Effect on Farm Productivity

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Abstract
This study aims to analyze the entrepreneurial behavior of farmers from the aspect of formal education and farming experience and its influence on farm productivity. The research population was rice paddy farmers in Cialam Jaya Village, Konda Subdistrict, South Konawe District, Southeast Sulawesi Province totaling 215. The number of samples was 140 farmers who were determined proportionally based on the area of cultivated land with the Slovin method. This research is quantitative using path analysis to analyze the direct and indirect effects of exogenous variables on endogenous variables. The results showed that farmers' formal education and farming experience had a positive effect on entrepreneurial behavior. Formal education of farmers has no direct effect on farm productivity but influences entrepreneurial behavior. Farming experience has a direct effect on farm productivity and indirectly through entrepreneurial behavior. Entrepreneurial behavior has a positive effect on farm productivity.

Keywords: Education, Experience, Entrepreneurial Behavior, Productivity

Analisis Perilaku Kewirausahaan Petani dan Pengaruhnya Terhadap Produktivitas Pertanian

Abstrak
Penelitian ini bertujuan untuk menganalisis perilaku kewirausahaan petani dari aspek pendidikan formal dan pengalaman berusaha tani serta pengaruhnya terhadap produktivitas usaha tani. Populasi penelitian adalah petani padi sawah di Desa Cialam Jaya, Kecamatan Konda, Kabupaten Konawe Selatan, Provinsi Sulawesi Tenggara yang berjumlah 215 orang. Jumlah sampel sebanyak 140 petani yang ditentukan secara proporsional berdasarkan luas lahan garapan dengan metode Slovin. Penelitian ini bersifat kuantitatif dengan menggunakan analisis jalur untuk menganalisis pengaruh langsung dan tidak langsung variabel eksogen terhadap variabel endogen. Hasil penelitian menunjukkan bahwa pendidikan formal dan pengalaman berusaha tani petani berpengaruh positif terhadap perilaku kewirausahaan. Pendidikan formal petani tidak berpengaruh langsung terhadap produktivitas usaha tani tetapi berpengaruh terhadap perilaku kewirausahaan. Pengalaman berusaha tani berpengaruh langsung terhadap produktivitas usaha tani dan secara tidak langsung melalui perilaku kewirausahaan. Perilaku kewirausahaan berpengaruh positif terhadap produktivitas usaha tani.

Kata Kunci: Pendidikan, Pengalaman, Perilaku Kewirausahaan, Produktivitas

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INTRODUCTION

Indonesia, as an agrarian country, has an agricultural sector that plays a role in advancing the national economy. In this context, agricultural development cannot only be carried out partially but is a by-product of Indonesia's general economic recovery strategy. Agricultural development needs to be placed or repositioned as the main foundation of economic development (Arifin, 2005). Therefore, it is essential to continue to spur growth in farm production and productivity as one of the sources of regional and national economic growth.

There have been many studies on factors affecting farm productivity, especially those related to physical production factors, such as capital, land and labor. Behind the various physical production factors is the capacity of farmers, which is very important in farm management. Farmers who have the capacity are certainly farmers who have ideas and innovations as well as qualified entrepreneurs. Entrepreneurship is one of the production factors and is a strategic need for farmers in managing their farms.

Productivity is generally defined as the ratio of a measure of the volume of output to a measure of the volume of input used (OECD, 2001). Productivity is production efficiency, which refers to how much output is produced from a set of inputs used (Syverson, 2011). Productivity is the ratio of outputs produced to inputs utilized (Coelli, *et. al.*, 2005).

The basic concept used to analyze productivity is the production function. In the concept of production function, it is known that the amount of production is a function of the production factors of natural resources, human resources, and capital. This study focuses on the characteristics of farmers' human resources in terms of formal education, farming experience, and entrepreneurial behavior.

According to the results of a study conducted in Ethiopia, adding one year of formal schooling for the average villager has a major effect on agricultural yields (Weir, 1999). Education is positively associated with productivit (Yasmeen, *et. al.*, 2011). Other research results conducted by Narayanamoorthy (2000) analyzed the impact of education on rice farming productivity by taking the average household education in terms of years of schooling, the results were not significant. Likewise, research conducted by Paltasingh & Goyari (2018) discovered that the years of schooling of the household head or the average years of schooling of the household as an education variable did not show a strong significant effect on productivity because there is a strong threshold effect of education on agricultural productivity. Whereas research done by Sujaya, *et. al*. (2018) concluded that farmer education has a positive effect on the productivity of rice mina farming.

Another factor that affects productivity is work experience. Some research results show that farming experience is one of the factors that have a positive effect on farm productivity. (Sjakir, *et. al.*, 2015; Bakhri & Sudaryono, 2016; Sugiantara & Utama, 2019). The same thing happens in the artisan industry where work experience is in line with the productivity of craftsmen. (Muliani & Suresmiathi, 2016). While other studies have found that farming experience has no effect on farm productivity (Sujaya, et. al., 2018; Kurniati & Vaulina, 2020; Lismawati, *et. al.*, 2020).

To support various factors that encourage the productivity of the agricultural sector, farmer human resources need to have the capacity for farmer entrepreneurship in farm management. This is expected to encourage the acceleration of growth and competitiveness in the agricultural sector as one of the efforts to spur regional and national economic development. This is supported by the research by Wanole, *et. al*. (2018) stated that farmers' innovativeness, motivation, decision-making ability, information-seeking behavior, leadership ability, cosmopolitanity and risk-taking ability play an important role in improving the agricultural performance of banana-based micro and small enterprises in Uganda. This is also the case with research by Atsu (2021) who concluded that the behavior of small-scale potato farmers affects the performance of small-scale potato enterprises in Molo District, Kenya.

Farmers have essentially become entrepreneurs through a natural learning process in their farming activities. Farmers are trained independently to manage their farms, make decisions, take risks, adopt and implement innovations, and other management tasks. However, the entrepreneurial ability of farmers is still relatively low (Sasmita, *et. al*., 2018), and some farmers already have relatively good entrepreneurial skills (Witemin & Utami, 2019).

Farmer entrepreneurship needs to be encouraged, especially in areas where commodities are based, in order to improve the competitiveness of agricultural products. In this regard, entrepreneurship has become an important issue in agriculture. Entrepreneurial skills, such as self-confidence, risk-taking, achievement orientation, innovativeness, and innovation itself, are needed by farmers (de Wolf, *et. al*., 2007). Meanwhile, farmers' inability to benefit from the application of science and technology is due to a lack of entrepreneurial capacity to handle the challenges associated with new technologies (Onyebinama, 2010). Farmers are required to have entrepreneurial characteristics to be able to innovate and increase their profits. This proves the importance of entrepreneurial characteristics in improving business success.

Characteristics of successful entrepreneurs are beginning to be widely researched to be learned and applied. (Kahan, 2012). Although entrepreneurship is considered to play an important role in the adoption of agricultural innovations, it is still necessary to study the entrepreneurial behavior of farmers as a determining factor for the growth and competitiveness of the agricultural sector. Therefore, farmer entrepreneurship should be a concern because entrepreneurship is a new determining factor in both improving farm performance and increasing farm production (Darmaji, 2014), and entrepreneurship are able to boost farmers' productivity and creativity (Dumasari, 2014).

In general, entrepreneurial behavior is a determining factor in business success. This is evidenced by the results of previous research, which shows that entrepreneurial behavior carried out by entrepreneurs can affect the performance of the businesses they run (Nursiah, *et. al*., 2015; Khairiyakh, *et. al*., 2019). Entrepreneurial behavior can be formed through education. In general, educated people have broad insights and are easier to make adjustments to, and think more rationally which can shape entrepreneurial behavior. In addition, entrepreneurial behavior can also be formed due to the experience of success or

failure that has been obtained before, so that it will make improvements, and has the potential to be more creative and innovative and can make the right decisions in managing their farms. Entrepreneurship can bridge the gap between education and productivity, as well as between work experience and productivity.

Entrepreneurship development is directly linked to the social and economic development of society. It is related to increased growth, increased wealth and an improved quality of life. Adesoji (2015) and Okeke, *et. al*. (2015) view entrepreneurship as job creation, income generation, poverty alleviation, improved nutrition, health and food security in the national economy. Kahan (2012) pointed out that entrepreneurship in agriculture has a significant impact on the growth and development of agribusiness. It is a key factor for the survival of small-scale agriculture in an ever-changing and increasingly complex global economy.

Entrepreneurial behavior can be synthesized between various terms and concepts into a set of basic ideas or dimensions of entrepreneurial behavior, namely creativity, leadership, planning, seizing opportunities, perseverance/resilience, courage to take risks, independence and social skills (Schmidt, *et. al.*, 2018)

Suharyono (2017) suggests that an entrepreneur can have up to 12 characteristics, namely: (1) achievement motive, (2) always perspective, (3) inventiveness, (4) innovative behavior, (5) commitment to work, (6) work ethic and responsibility, (7) independence, (8) courage in facing risks, (9) looking for opportunities, (10) leadership spirit, (11) managerial skills, and (12) personal skills.

Motivation, risk-taking, innovation and managerial competence are factors that can shape farmer entrepreneurship (Arisena, 2016). The character that exists within the individual influences entrepreneurial behavior through encouragement which can then shape a person's attitude in acting to gain knowledge in carrying out business activities, and have the skills to produce products. The entrepreneurial behavior of farmers can continue to grow and be developed and one way that can be done is by increasing the motivation of farmers (Puspitasari, 2013)

The attitudes, knowledge and skills shown through farmers' real actions are determined by their courage to take risks, responsiveness to opportunities, willingness to innovate, and motivation (Astuti, *et. al*, 2019). Entrepreneurial behavior consists of seven to thirteen elements: achievement motivation, autonomy, innovation, proactive, and cosmopolitan behavior, decision-making ability, and locus of control, information-seeking behavior, risk-taking propensity, and self-efficacy, self-confidence, coordinating and planning ability. These components are perceived differently by researchers (Mudiwa, 2018). Meanwhile, Balasaravanan & Vijayadurai (2012) suggested that farmers' entrepreneurial behavior can be measured by innovation, decision-making ability, economic motivation, risk-taking ability, information seeking ability and leadership ability.

The importance of entrepreneurship for farmers because it can encourage farmers to take advantage of market opportunities so that the various types of products produced are always adjusted to trends, variations, flavors, and expectations of consumer tastes. Therefore, productivity, creativity, business orientation and bargaining position are related

to the entrepreneurial spirit and ability of farmers and their strategic position as farm managers (Pujiati & Dumasari, 2012 dalam Dumasari, 2014).

Entrepreneurship is very important for a country in order to explore the potential wealth owned by a country, which is then developed and utilized for the welfare of its population. These efforts must be made by the country itself, and will be successful if the nation has an entrepreneurial spirit in an effort to increase wealth values by exploring, developing and utilizing resources. Therefore, entrepreneurship is very necessary, because every farmer has the potential to develop themselves in an effort to meet the ever-increasing needs (Arisena, 2016).

Efforts to empower farmers through the management of various types of micro-businesses require entrepreneurship development based on local resources. Such entrepreneurship development has the potential to be carried out through informal education activities by relying on a participatory group approach (Dumasari, 2014). It is undeniable that entrepreneurship is a skill that can be acquired through education (Nowiński *et. al*., 2019). Even individuals tend to acquire knowledge that can equip entrepreneurs with useful abilities and skills through education, especially formal education (Martinez, *et. al*., 2010).

More educated farmers can adjust better and faster than those who are less educated or illiterate (Hojo, 2004). Therefore, more educated rice farmers have the competence and ability to accept technological change and innovation (Susilastuti, *et. al*., 2018). The role of education in increasing productivity can be through changes in the behavior of farmers who are able to accept technological changes, and are able to make innovations. Or in other words, formal education does not directly increase productivity (Lismawati, *et. al*., 2020).

Another factor that can influence entrepreneurial behavior is work experience. Experience or length of farming is an important factor that affects the skills and competence of farmers in managing their farms (Salim, *et. al.*, 2019). McStay (2008) suggests that previous work experience affects decision-making and business performance. In addition, Liguori, *et. al*. (2017) stated that experience has a positive effect on self-efficacy and entrepreneurial expectations.

This study aims to: 1) Analyze the effect of formal education and farming experience on farmers' entrepreneurial behavior; 2) Analyze the direct effect of formal education, farming experience, and farmers' entrepreneurial behavior on farm productivity; 3) Examine the effect of formal education on productivity of paddy rice farming through farmers' entrepreneurial behavior; 4) Examine the effect of farming experience on productivity of paddy rice farming through farmers' entrepreneurial behavior.

The previous studies described above only analyzed the direct effect of formal education, work experience, and entrepreneurial behavior on productivity. Hence, the difference between this research and previous research is that this study not only analyzes the direct effect of formal education, work experience and entrepreneurial behavior, but also analyzes the effect of formal education and work experience on-farm productivity through entrepreneurial behavior.

METHOD

This research was conducted in Cialam Jaya Village, Konda Sub-district, South Konawe District, Southeast Sulawesi Province. Cialam Jaya Village is one of the villages with an economic base of paddy rice with a land area of 181.125 Ha. The total population of wet-rice farmers in Cialam Jaya Village was 215 farmers classified by wet-rice land area. The determination of the number of samples was carried out using the Slovin method below:

$$n = \frac{N}{Na^2}$$

$$n = \frac{215}{1+215(0{,}05^2)} = 140$$

The total number of samples obtained was a total of 140 wet-rice farmers. The number of samples from each land area group was determined based on Table 1, which is the percentage of the number of farmers from each land area group multiplied by the total sample size of 140.

Table 1. *Classification of the Number of Rice Field Farmers in Cialam Jaya Village Based on the Area of Cultivated Rice Fields*

Land Area (Ha)	Total Population	Percentage	Total Sample
≤ 0,5	52	24,1	34
> 0,51 to 1	130	60,5	85
> 1 to 1,5	23	10,7	15
> 1,5	10	4,6	6
Total	215	100	140

Data on research variables were obtained by circulating a research questionnaire to rice paddy farmers who became the research sample. The research instrument used to obtain data on research variables contains about:

1. Farmer education refers to the length of time farmers have been in formal education (in years) and is a ratio scale.
2. Experience in wet-rice farming, which is the experience of farmers in wet-rice farming (in years) is a ratio scale.
3. Entrepreneurial behavior using Likert scale which is an ordinal scale. Indicators of entrepreneurial behavior consist of six dimensions, namely:
   a) Innovative, which consists of four indicators: (1) Rejecting new methods because they are comfortable with the old ones; (2) Not having time to learn new ideas; (3) Enthusiastic about innovating by finding new ways; and (4) Always implementing new methods.
   b) Motivation to succeed/achieve consists of five indicators: (1) Prefer tasks that are not troublesome; (2) Look for new challenges after completing one task; (3) Continue to

learn to anticipate new problems; (4) Like tasks that challenge abilities; (5) Look for ways to get perfect results.

c) Decision-making ability consists of five: (1) Becomes hesitant if the decision is rejected; (2) Knows what is best without depending on people's directions; (3) Is more confident if following the crowd; (4) Seeks a way out if the decision is rejected; (5) Is anxious if the choice is different from the closest person.
d) Risk-taking orientation consists of five indicators: (1) Dare to take risks on the business undertaken; (2) Have the type of person who dares to compete; (3) Not afraid of making mistakes; (4) Keep away from situations that are full of problems; (5) Feel hatred if they fail.
e) Information seeking behavior consists of five indicators: (1) Using technology to make it easier to find information; (2) When searching for information, I identify the problem topic of the information I need; (3) Being able to analyze the search for information that is suitable for successful farming; (4) Making good use of information for farm development; (5) Comparing new knowledge with existing knowledge to determine the added value of the information found.
f) The leadership dimension consists of six indicators: (1) Setting goals in work and planning; (2) Building cooperation among groups; (3) Motivating family members and friends; (4) Delegating tasks/responsibilities to encourage initiative; (5) Being able to understand and appreciate the needs/desires and feelings of fellow friends; (6) Appreciating the achievements of family members or groups.

4. Farm productivity, referring to the average production per one Ha of cultivated paddy land is a ratio scale.

The dimensions of entrepreneurial behavior variables were adopted from Balasaravanan & Vijayadurai (2012). Furthermore, these dimensions were developed in several indicators, so that the total indicators amounted to 30 items.

For the purposes of parametric statistical analysis, namely regression analysis, where the minimum data requirements are interval scale. Therefore, specifically for the variable entrepreneurial behavior of farmers which is an ordinal scale is transformed from an ordinal scale into an interval scale using the successive interval method (MSI).

To measure whether the instrument of entrepreneurial behavior of farmers is a valid and reliable instrument, the validity and reliability of the instrument is tested. The validity test uses item validity, namely the correlation between the score of each item with the total score of all items. While the reliability of the instrument is measured based on Cronbach's Alpha coefficient.

The analysis technique used is path analysis to determine the causal relationship, with the aim of explaining the direct or indirect effect between exogenous variables with endogenous variables. Exogenous variables consisted of formal education of farmers, and experience in paddy rice farming. While the endogenous variables are entrepreneurial behavior of farmers and productivity of paddy rice farming. Path analysis is a multiple regression analysis, therefore the analysis requirements test is based on classical assumptions, namely data normality test, multicollinear test, and heteroscedastic test.

The relationship between the research variables was analyzed using multiple linear regression analysis with the following equation:

$Y = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + e_1$ .....(1)
$Z = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 Y + e_2$ .....(2)
Description:
Y = Farmer entrepreneurial behavior
X_1 = Formal education of farmers
X_2 = Farming experience
Z = Productivity of wet-rice farming

Based on the results of the multiple linear regression analysis above (Equations (1) and (2)) using standardized coefficients, the following structural equation of path analysis is formed.

$Y = PYPX_1 + PYPX_2 + e_1$ .....(3)
$Z = PZPX_1 + PZPX_2 + PZPY + e_2$ .....(4)
Description:
Y = Farmer entrepreneurial behavior (endogenous variable)
Z = Productivity of paddy rice farming (endogenous variable)
X_1 = Formal education of wetland rice farmers (exogenous variable)
X_2 =Rice paddy farming experience (exogenous variable)
P = standardized beta coefficient (influence coefficient)
e_1, e_2 = Residual factors

Educated farmers have a broader insight so that education is one of the determining factors in the formation of entrepreneurial behavior. Another factor that can shape entrepreneurial behavior is farming experience. Experienced farmers certainly have a lot of understanding of the ins and outs of farming, so with experience farmers are able to make changes, always seek information, innovate, have a high motivation to be better, able to face and minimize risk, dare to make decisions, and have leadership skills in the management of their farms. Hence, educated and experienced farmers are expected to manage their farms efficiently, effectively, and productively. Therefore, the effect of education, and farming experience on the productivity of paddy rice farming either directly or through entrepreneurial behavior needs to be tested. The hypothesis proposed is as follows:

1. H0: Formal education of farmers has no effect on entrepreneurial behavior.
   H1: Formal education of farmers affects entrepreneurial behavior.
2. H0: Farming experience has no effect on entrepreneurial behavior.
   H1: Farming experience affects entrepreneurial behavior.
3. H0: Formal education of farmers has no direct effect on the productivity of rice paddy farming.

H1: Formal education of farmers has a direct effect on the productivity of paddy rice farming.

4. H0: Farming experience has no direct effect on the productivity of paddy rice farming.
   H1: Farming experience has a direct effect on the productivity of paddy rice farming.
5. H0: Entrepreneurial behavior has no effect on the productivity of paddy rice farming.
   H1: Entrepreneurial behavior affects the productivity of paddy rice farming.
6. H0: Farmers' formal education has no effect on the productivity of paddy rice farming through entrepreneurial behavior.
   H1: Farmers' formal education affects the productivity of paddy rice farming through entrepreneurial behavior.
7. H0: Farming experience has no effect on the productivity of paddy rice farming through entrepreneurial behavior.
   H1: Farming experience affects the productivity of paddy rice farming through entrepreneurial behavior.

Rejection/acceptance of the hypothesis at the significance level α= 0,05. Hypothesis testing for hypotheses 1, 2, 3, 4, and 5 is based on the significance of the t-statistic from the regression analysis results, which has no significant effect if the p-value ≥ 0,05, and a significant effect if the p-value < 0,05. As for hypotheses 6 and 7 using Sobel-tests (Soper, n.d., *https://www.danielsoper.com/statcalc/calculator. aspx?id=31).* Furthermore, the simultaneous effect of Model 1 and Model 2 based on the calculated F value from the ANOVA results.

FINDING AND DISCUSSION

Prior to data analysis, first test the validity and reliability of research instruments for entrepreneurial behavior variables of farmers. The results of the instrument validity test showed that all *item* in the research instrument (there are 30 *item*) are positively correlated with the total *item* of entrepreneurial behavior of farmers (TSY), namely r-count> (r-table = 0.166) with a p-value <0.05. Thus, the entrepreneurial behavior instrument is valid.

Table 2. *Results of Item Validity Test of Research Instruments*

Item	TSY	Sig.(2-tailed)	Description
SY1	0,451**	0,000	Valid
SY2	0,592**	0,000	Valid
SY3	0,636**	0,000	Valid
SY4	0,623**	0,000	Valid
SY5	0,610**	0,000	Valid
SY6	0,572**	0,000	Valid
SY7	0,695**	0,000	Valid
SY8	0,669**	0,000	Valid
SY9	0,689**	0,000	Valid
SY10	0,744**	0,000	Valid

SY11	0,628**	0,000	Valid
SY12	0,743**	0,000	Valid
SY13	0,657**	0,000	Valid
SY14	0,727**	0,000	Valid
SY15	0,687**	0,000	Valid
SY16	0,658**	0,000	Valid
SY17	0,694**	0,000	Valid
SY18	0,630**	0,000	Valid
SY19	0,691**	0,000	Valid
SY20	0,696**	0,000	Valid
SY21	0,769**	0,000	Valid
SY22	0,692**	0,000	Valid
SY23	0,737**	0,000	Valid
SY24	0,773**	0,000	Valid
SY25	0,722**	0,000	Valid
SY26	0,693**	0,000	Valid
SY27	0,682**	0,000	Valid
SY28	0,735**	0,000	Valid
SY29	0,734**	0,000	Valid
SY30	0,821**	0,000	Valid

Table 3. *Reliability Test of Research Instruments*

Reliability Statistics	Item	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
0,961	SY1	0,418	0,961
	SY2	0,563	0,960
	SY3	0,611	0,960
	SY4	0,595	0,960
	SY5	0,578	0,960
	SY6	0,540	0,960
	SY7	0,669	0,959
	SY8	0,637	0,960
	SY9	0,661	0,959
	SY10	0,718	0,959
	SY11	0,600	0,960
	SY12	0,717	0,959
	SY13	0,629	0,960
	SY14	0,701	0,959
	SY15	0,660	0,959
	SY16	0,631	0,960
	SY17	0,667	0,959
	SY18	0,601	0,960

SY19	0,666	0,959
SY20	0,669	0,959
SY21	0,746	0,959
SY22	0,666	0,959
SY23	0,711	0,959
SY24	0,752	0,959
SY25	0,698	0,959
SY26	0,669	0,959
SY27	0,656	0,959
SY28	0,710	0,959
SY29	0,710	0,959
SY30	0,801	0,958

The Kolmogorov-Smirnov normality test results in Table 4 show that the dependent variables Y (entrepreneurial behavior) and Z (farm productivity) are normally distributed data with a p-value > 0.05.

Table 4. *Results of the Data Normality Test for the Dependent Variable*

Dependent Variable	Statistic	Df	Sig.	Decision
Y	0,068	140	0,200 > 0,05	Normal
Z	0,074	140	0,059 > 0,05	Normal

The multicolinear test results show a tolerance value (p-value) > 0.10 or a Variance Inflation Factor (VIF) value < 10.00. Thus, there is no multicollinear problem or there is no strong linear correlation between independent variables.

Table 5. *Multicollinear Test Between Independent Variables*

Model	Independent variable	Tolerance	VIF	Decision
1 Dependent variable: Y	X1	0,749	1,336	Multicollinear free
	X2	0,749	1,336	
2 Dependent variable: Z	X1	0,556	1,799	Multicollinear free
	X2	0,492	2,033	
	Y	0,366	2,730	

The heteroscedasticity test aims to test whether in the regression model there is an inequality of variance from the residuals of one observation to another. The test results show that in Model 1 the significance of X1 and X2 p-value > 0.05, and in Model 2 the significance of X1, X2, Y p-value > 0.05. Thus, Model 1 and Model 2 have no heteroscedasticity problem.

Table 6. *Heteroscedasticity Test*

Model	Independent variable	t-statistic	Sig.	Decision
1. Dep. Var: Abs_RES1	X1	0,156	0,876	Heteroscedastic Free
	X2	-1,463	0,146	
2. Dep. Var: Abs_RES2	X1	1,036	0,302	Heteroscedastic Free
	X2	-0.821	0,413	
	Y	-1,352	0,179	

To determine the effect of formal education and farming experience on the entrepreneurial behavior of farmers can be seen based on the results of Model 1 analysis in Table 7 below.

Table 7. *Model 1 Analysis Results with the Dependent Variable Entrepreneurial Behavior (Y)*

Independent variable	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t-statistic	*Sig.*
X1	4,654	0,675	0,412	6,890	0,000
X2	2,990	0,354	0,505	8,457	0,000

The test results of hypothesis 1 as in Table 7 are known for X1 t-count value of 6.890, and p-value <0.05. It shows that formal education has a positive and significant effect on the entrepreneurial behavior of farmers. The path coefficient of the effect of formal education (X1) on entrepreneurial behavior (Y) of $(0,412)^2$ = 0,1697 or 16,97 percent of changes in entrepreneurial behavior of farmers influenced by formal education of farmers.

This finding is in accordance with the results of research by Sutanto (2017) and Marliati (2020) that formal education has a significant effect on entrepreneurial behavior. Demikian halnya Nowiński, *et. al*. (2019) argued that entrepreneurship is a skill that can be obtained through education. However, in contrast to some other research results that education has no direct effect on farmer productivity (Narayanamoorthy, 2000; Eric, *et. al.*, 2014; Paltasingh & Goyari, 2018; Lismawati, *et. al.*, 2020).

More educated farmers can adjust better and faster than those who are less educated or illiterate (Hojo, 2004). Therefore, more educated rice farmers have the competence and ability to accept technological change and innovation (Susilastuti, *et. al.*, 2018). In essence, education makes a rational way of thinking. Hence, highly educated farmers have extensive knowledge, easily develop ideas, easily adopt technology and are more dynamic in their attitude towards new things, especially in the face of more modern changes.

The test results of hypothesis 2 show that farming experience (X2) has a significant effect on the entrepreneurial behavior of farmers (Y) with a t-count of 8.457, and p-value <0.05. The path coefficient of the effect of farming experience on entrepreneurial behavior is $(0,505)^2$ = 0,2550. This means that the effect of farming experience on entrepreneurial behavior of farmers by 25.50 percent.

The effect of experience on entrepreneurial behavior is in line with that stated by Salim, *et. al*. (2019) that experience or length of farming is an important factor affecting the skills and competence of farmers in managing their farms. This is supported by McStay (2008) who states that previous work experience affects decision-making and business performance. Likewise, Liguori, *et. al*. (2017) stated that experience has a positive effect on self-efficacy and entrepreneurial expectations. The results of this study differ from several other studies which found that farming experience has no effect on farm productivity (Sujaya, et. al., 2018; Kurniati & Vaulina, 2020).

The results of ANOVA Model 1 obtained F-count = 118.495 with a p-value of 0.000 <0.05 which indicates that formal education (X1) and farming experience (X2) together have a significant effect on farmers' entrepreneurial behavior (Y). The coefficient of determination of Model 1 is R^2 = 0,634, which means 63.40 percent of changes in the entrepreneurial behavior of farmers are determined by formal education and farming experience together, and 36.60 percent is determined by other variables from outside the model.The results of the Model 2 analysis can be seen in Table 8 below.

Table 8. *Model 2 Analysis Results with the Dependent variable Farm Productivity (Z)*

Independent variable	Unstandardized Coefficients	Std. Error	Standardized Coefficients	*t*	*Sig.*
X1	0,122	0,091	0,069	1,339	0,183
X2	0,361	0,051	0,391	7,120	0,000
Y	0,082	0,010	0,523	8,223	0,000

The test results of hypothesis 3 showed that formal education of farmers had no direct effect on the productivity of paddy rice farming with a t-count of 1.339, and p-value > 0.05. The path coefficient of the direct effect of formal education on the productivity of paddy rice farming amounted to $(0,069)^2$ = 0,0048. The effect of formal education on farm productivity is very small at 0.48 percent.

The results of this study are in line with the findings of Eric, *et. al*. (2014), , that formal education has no effect on agricultural productivity. The same results were expressed by Narayanamoorthy (2000), and Paltasingh & Goyari (2018). Likewise, research by Lismawati, *et. al*. (2020) that education has no significant effect on wet-rice farming. While the results of Weir's research (1999), and the results of Yasmeen's research, *et. al*. (2011) found that education has a positive effect on agricultural productivity.

The test results of hypothesis 4 show that farming experience has a significant direct effect on the productivity of paddy rice farming with a t-count of 7.120, and p-value <0.05. The path coefficient of the direct effect of farming experience on the productivity of paddy rice farming is $(0,391)^2$ = 0,1529 or 15,29 percent of changes in the productivity of paddy rice farming is influenced by farming experience.

The results of this study are in line with those stated by Sjakir, *et. al.*, (2015) bahwa atribut pribadi petani terutama pengalaman kerja memiliki pengaruh signifikan dan positif

terhadap produktivitas padi. Bakhri & Sudaryono (2016) found that farming experience has a positive and significant effect on farm productivity in both Peterongan District and Megaluh District, Jombang Regency. Likewise, Sugiantara & Utama (2019), found that farming experience has a positive and significant effect on asparagus farm productivity.

The test results of hypothesis 5 showed that entrepreneurial behavior has a significant effect on the productivity of paddy rice farming with a t-count of 8.223, and sig. p-value <0.05. The path coefficient of the effect of entrepreneurial behavior on the productivity of paddy rice farming $(0,523)^2$ = 0,2735 or 27,35 percent of changes in the productivity of paddy rice farming is influenced by the entrepreneurial behavior of farmers.

The results of this study are in line with Darmaji (2014) that entrepreneurship is a determinant that has a positive effect on farm productivity in addition to land, labor, capital, and management. Likewise, Ashlina, et. al (2019), stated that entrepreneurial behavior has a significant effect on business performance. Then research by Khairiyakh, *et. al*. (2019) discovered that entrepreneurial behavior has a significant effect on the performance of rubber farms in Jambi Province. The results of Atsu's research (2021) that the behavior of small-scale potato farmers affects the performance of small-scale potato businesses in Molo District, Kenya. Furthermore, the significance test of the indirect effect of formal education and farming experience on the productivity of paddy rice farming through the entrepreneurial behavior of farmers is the Sobel-test conducted online on the page https://www.danielsoper.com/statcalc/calculator.aspx?id=31

Test hypothesis 6, namely the indirect effect of formal education on the productivity of paddy rice farming, based on the regression coefficient of formal education Model 1 (A) = 4.654 and its standard error (SE_A) = 0,675, and the regression coefficient of entrepreneurial behavior Model 2 (B) = 0,082 and its standar error (SE_B) = 0,010 inputted online on the Sobel test application as in Figure 1. Based on the results of the Sobel test, it shows that the formal education of farmers has a significant effect on the productivity of paddy rice farming through entrepreneurial behavior, where the test statistic of the Sobel test = 5.277, and p-value 0.0 < 0.05. This means that entrepreneurial behavior is a mediator between farmers' formal education and the productivity of paddy rice farming.

The indirect effect of formal education on the productivity of paddy rice farming through entrepreneurial behavior is 0.412 x 0.523 = 0.2155 or 21.55 percent. While the total effect of formal education on the productivity of paddy rice farming is the direct effect plus indirect effect, namely 0.48 + 21.55 = 22.03 percent.

The results of this analysis indicate that education can affect the productivity of farming if mediated by entrepreneurial behavior. This is in accordance with the results of the analysis in hypothesis 1 test, namely formal education affects entrepreneurial behavior, and in hypothesis 3 entrepreneurial behavior has a positive effect on the productivity of paddy rice farming. Hence, educational factors are important in shaping entrepreneurial behavior and will ultimately affect business success (Marliati, 2020).

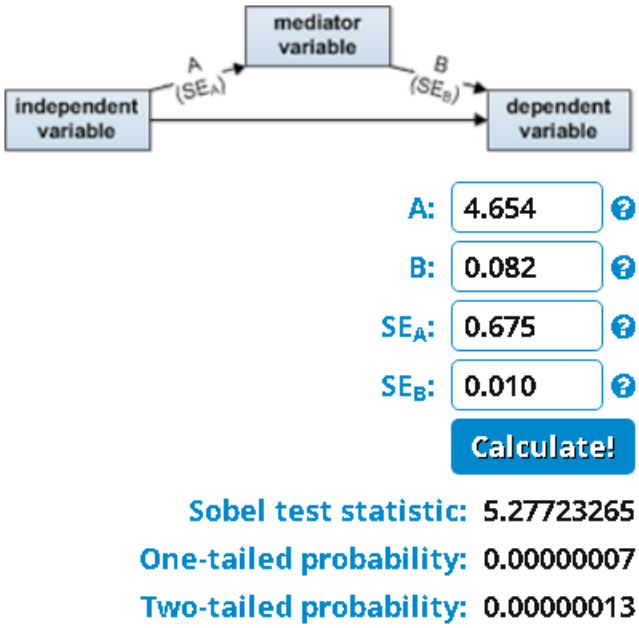

Figure 1. Significance test results of the indirect effect of formal education on the productivity of paddy rice farming through entrepreneurial behavior.

Test hypothesis 7 of the indirect effect of farming experience on the productivity of paddy rice farming, by inputting the regression coefficient of farming experience (A) = 2,990 and its standar error (SE_A) = 0,354 in Model 1, and the regression coefficient of entrepreneurial behavior (B) = 0,082 and its standar error (SE_B) = 0,010 Model 2 online in the Sobel test application as shown in Figure 2. The Sobel test results show that farming experience has a significant effect on the productivity of paddy rice farming through entrepreneurial behavior, where the test statistic of the Sobel test = 5.883, and p-value <0.05. This means that entrepreneurial behavior is a mediator between farming experience and the productivity of paddy rice farming.

The indirect effect of farming experience on the productivity of paddy rice farming through entrepreneurial behavior is 0.505 x 0.523 = 0.2641 or 26.41 percent. While the total effect of farming experience on the productivity of paddy rice farming is the direct effect plus the indirect effect, namely 15.29 + 26.41 = 41.70 percent.

The results of this analysis are in accordance with hypothesis 2 that farming experience has a positive and significant effect on entrepreneurial behavior. Experienced farmers can form entrepreneurial behavior in farm management, and further support the increase in farm productivity. Hence, farming experience can have a direct effect on farm productivity, and can have an effect through entrepreneurial behavior.

Based on the results of ANOVA known F-count = 179.316 with sig. p-value 0.000 <0.05 which indicates that formal education, farming experience, and entrepreneurial behavior together significantly affect the productivity of paddy rice farming. Then the coefficient of determination of Model 2 is R^2 = 0,798, which is 79,80 percent of changes in productivity of paddy rice farming is determined by formal education, farming experience,

and entrepreneurial behavior together, and 20.20 percent is determined by other variables from outside the model.

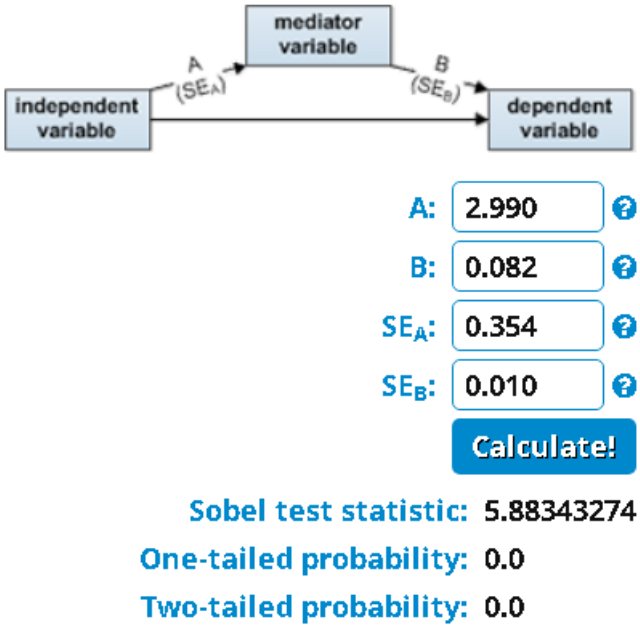

Figure 2. The results of the significance test of the indirect effect of farming experience on the productivity of paddy rice farming through entrepreneurial behavior.

CONCLUSION

According to the results of the study, the formal education of farmers and farming experience has a positive and significant effect on the entrepreneurial behavior of farmers. The findings clarify that entrepreneurial behavior can be formed through education and farming experience. The analysis also shows that entrepreneurial behavior has a positive effect on farm productivity. Likewise, farming experience has a positive effect on farm productivity, both directly and through entrepreneurial behavior. Meanwhile, farmer education has no direct effect on farm productivity but has an effect on entrepreneurial behavior.

The results indicate the importance of education and farming experience in increasing the productivity of the agricultural sector through the formation of entrepreneurship. Education could be provided through formal education for the younger generation and through training and technical guidance for farmers who are past school age. Hence, increasing farm productivity is not enough if it is only done through the utilization of physical factors of production, such as capital, land, and labor. However, increasing farmer productivity could be achieved through the development of human resources.

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