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FACTORS INFLUENCING FARMERS' DECISIONS TO PURCHASE CERTIFIED RICE SEEDS OF UD RESTU TANI JEMBER

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ABSTRAK

Penggunaan benih padi bersertifikat memiliki beberapa kelemahan seperti harga gabah relatif sama dengan benih padi non bersertifikat dan hasil panen tidak optimal jika varietas benih yang ditanam tidak diganti setiap musim tanam. Oleh karenanya, industri perbenihan berusaha meningkatkan kualitas pelayanan dan produk seperti yang dilakukan oleh UD Restu Tani yaitu melakukan segmentasi mutu benih. Penelitian ini bertujuan untuk mengetahui faktor-faktor yang mempengaruhi keputusan petani dalam membeli benih padi bersertifikat UD Restu Tani dan atribut yang mempengaruhi keputusan petani dalam membeli benih padi bersertifikat. Penelitian dilakukan di Kabupaten Jember. Metode pengambilan contoh dilakukan menggunakan metode *convenience sampling* yaitu sebanyak 126 sampel. Hasil penelitian menunjukkan bahwa (1) faktor yang mempengaruhi keputusan petani membeli benih padi bersertifikat UD Restu Tani dengan taraf nyata 10% yaitu faktor pendidikan, umur, dan mutu benih dan (2) keputusan petani membeli benih padi bersertifikat dipengaruhi oleh lima faktor baru yaitu faktor informasi teknis penanaman, faktor keabsahan sertifikasi produk, faktor ketersediaan produk benih, faktor kualitas produk benih, dan faktor harga produk benih.
***Kata kunci**: analisis faktor, benih padi bersertifikat, keputusan petani, regresi logistik.*

ABSTRACT

The use of certified rice seeds has several weaknesses, including the price of grain that is relatively the same as non-certified rice seeds and production that is not optimal if the varieties of seeds planted are not replaced every planting season. Therefore, the seed industry is trying to improve the service quality and products, as was done by UD. Restu Tani, which is by segmenting the quality of seeds. This study aims to determine the factors that influence farmers' decisions to purchase certified rice seeds UD Restu Tani and to analyze the attributes that influence farmers' decisions to purchase certified rice seeds. The research was conducted in Jember Regency. The sampling method was carried out using convenience sampling with 126 samples. The results showed that (1) the factors that influenced the farmers' decision to purchase certified rice seeds of UD Restu Tani with a real level of 10% were education, age, and quality of the seeds and (2) the farmers' decision to purchase certified rice seeds was influenced by five new factors, including planting technical information, product certification validity factor, seed product availability factor, seed product quality, and seed product price.
***Keywords:** certified rice seed, factor analysis, farmer decision, logistic regression.*

INTRODUCTION

Superior and quality seeds are one of the significant factors affecting the increase in rice production. It is because superior seeds not only raise the productivity of rice plants directly but also raise the frequency of annual rice harvests to three times. If the increase in productivity and harvest frequency is accompanied by an increase in harvested area, the utilization of superior seeds will greatly enhance rice production (Raditya, Asriani, & Suci, 2015).

Farmers consider the use of superior and certified rice seeds can increase their farming success because the offspring or seed purity is evident, the seeds are healthier and tougher, the growth is faster and uniform, the plant population is optimal, ripens and harvests at the same time, The panicle number is vast, and production is great, resulting in high revenue. As a result, many farmers prefer to buy certified seeds rather than use derivative seeds, thus pushing up the demand for certified rice seeds (Nugroho, 2011).

Rice seeds are rice planting material in the form of seeds. Rice seed production activities are performed through rice breeding activities. Based on their production activities, rice seeds are classified into two types, including informal and formal seed systems. Seeds produced in formal seed systems are usually called certified rice seeds, which have satisfied seed quality standards based on seed certification according to the OECD Scheme and ISTA Rules, and quality management systems based on ISO 9001:2000 or SNI 19-9001-2001 (Nugraha & Sayaka, 2004; Nugraha, Wahyuni, Samaullah, & Ruskandar, 2010).

According to Ishaq (2009), certified rice seeds are classified into four classifications, including type seeds (BS), basic seeds (FS), staple seeds (SS), and spread seeds (ES). The utilization of certified rice seeds will provide profits for farmers including guaranteeing agricultural success, guaranteed quality, quick development, known offspring, stronger plant roots, optimal population, early maturity at the same time, and high production (Andayani & Watiah, 2017; Nugroho, 2011). Farmers are urged to utilize certified rice seeds by the government. The seed industry keeps expanding in order to offer farmers high-quality rice seeds.

Seed institutions include research subsystems, producers, seed traders or distributors, and seed quality assurance (Manzanilla, Janiya, & Johnson, 2013). In Indonesia, rice seed producers are classified into two categories including state-owned industries (PT Pertani and PT Sang Hyang Seri), as well as private and individual producers. The seeds for confinement originate from VUB, which is developed by the UPTD BBI for Food Crops and the Institute for Agricultural Technology Studies (BPTP).

In 2017, seed producers successfully produced 210,561 tons of certified rice seeds, however, this amount was only enough to cover 54.93 percent of the field's demands (Darmono, 2018). According to the head of the East Java Agriculture Service, East Java generated 27.86% of certified rice seed output in 2016 (Christyaningsih & Putra, 2016). More than 500 seed industries contribute to this output. As of October 2019, seed production in East Java, including Jember Regency as a rice hub, has reached 4,772.86 tons, consisting of basic seeds, staple seeds, and spread seeds (UPTPSBTPH Kabupaten Jember, 2019).

UD Restu Tani is one of the main seed industries with the largest production in Jember Regency, having been in operation since 2007. The producer's certification license number is 068/BPSBTPH/PRD/JBR/IV/2007. The number of seeds produced was 430.38 Tons in 2019, consisting of the Way Apo, Cibogo, Ciherang, Logawa, Situ Bagendit, Inpari 33, Inpari 42, Inpari 43, Mekongga, and IR64 varieties (UPTPSBTPH Kabupaten Jember, 2019).

UD Restu Tani produces certified rice seeds in two packages, including premium (5Kg packaging) and normal (10Kg packaging). The marketing process runs through its contract distributors (PT Forum Agro Sukses

Timur and PT Karisma Indoagro Universal) and non-contract distributors (with more than 20 distributors). Seed marketing zones can be found in all areas in Jember Regency and throughout Indonesia.

The advancement of the seed industry, as well as the benefits given by certified rice seeds, have failed to pique farmers' enthusiasm in using certified rice seeds. Only 76.86 percent of certified rice seeds were used by farmers in 2016 (Nuswardhani & Arief, 2019). Farmers are unable to benefit from the improvement in production since field conditions indicate that farmers seldom change seed varieties. As a result, the seeds will be more vulnerable to pest attacks, resulting in lower production (Juanda, 2016). Furthermore, because the purchase price of grain from certified and non-certified rice seeds is nearly the same, farmers do not benefit financially from using certified rice seeds.

In Jember Regency, the majority of farmers grow rice every year and utilize certified rice seeds. Seeds can be purchased from agricultural kiosks. Farmers' desire in buying certified rice seeds is not diminished by the presence of a gap between the superiority of the seeds given and the reality on the ground. Seed manufacturers, particularly those in the industrial sector, are progressively attempting to enhance the services they give, such as UD Restu Tani's seed quality segmentation service. The objectives of this study were to determine (1) the factors influencing farmers' decisions to purchase certified rice seeds of UD Restu Tani Jember, and (2) the attributes influencing farmers' decisions to purchase certified rice seeds.

Studies related to farmers' decisions in purchasing rice seeds or other plant seeds have been widely conducted before. Studies conducted by Zahara et al., (2013) and Pinem & Safrida, (2018) revealed that significant factors in influencing farmers' decisions to buy seeds, including advice from PPL, education, production, resistance to pests, and plant diseases (HPT), and seed prices. Meanwhile, the research conducted by Permasih, (2014); Aji et al., (2001); Rahmawati et al., (2018); dan Ramadhan, (2013) revealed that several attributes influence farmers' decisions in purchasing seeds including seed quality, price, service quality, availability of seeds and production, availability of funds and consideration of costs, profitability, and risk. Different from the previous research, this study seeks to describe the factors influencing farmers' decisions to purchase while at the same time classifying the attributes influencing farmers' decisions to purchase certified rice seeds.

Consumer decisions in purchasing products are influenced by a variety of factors, including individual characteristics, individual psychology, and environmental factors (Engel, Blackwell, & Miniard, 1994). Attributes and physical products are also often supporting factors in influencing the decision to purchase a product (Khoirunnisa, 2019). The focus of this study is rice farmers in Jember Regency who decide to purchase certified rice seeds. Farmers should understand the factors and attributes of seeds as knowledge when purchasing certified rice seeds so that they can provide an assessment of these attributes. This assessment can support the seed industry enhance the service quality and the quality of certified rice seed products.

RESEARCH METHOD

This study was conducted from February to March 2020. The method to determine the research site was performed using a purposive method. The research was conducted in Jember Regency following the consideration that UD Restu Tani is located in Jember Regency and most of its products are distributed in Jember Regency. The research was conducted at agricultural kiosks such as the 'FAST' network of agricultural kiosks and agricultural kiosks in rural areas in Jember Regency.

The method used to determine the respondents was convenience sampling. The convenience sampling method is a sampling technique by selecting people who fulfill and satisfy the research criteria and are willing to be chosen as research samples (Gravetter &

Forzano, 2011). The sample criteria selected were farmers who have purchased certified rice seeds for both the UD Restu Tani brand and other brands.

The number of samples utilized in factor analysis research is at least five times the number of variables that have been determined (Riyanto, 2012; Simamora, 2005). Using the convenience sampling method, 126 respondents consisted of 85 farmers who purchased certified rice seeds of the UD Restu Tani brand and 41 farmers who decided to purchase certified seeds from other brands were interviewed in this study.

The data collection method was performed through interviews, observation, and documentation. Interview activities were conducted using a questionnaire. The questionnaire technique is a collecting data technique by providing or distributing a list of questions to the respondents (Umar, 2005). The interviews were carried out on-site when purchasing seeds or at the farmers' residence based on information obtained from the company, kiosk, or agreement with the respondent concerned. The data obtained is related to factors influencing farmers' decisions to purchase certified seeds. Observation activities were conducted to obtain data related to farmers' decisions to purchase certified rice seeds. Observations complemented data from interviews, for example by looking at the type, brand, and availability of certified rice seeds at the input kiosk. Documentation data was obtained from related institutions or agencies, including UPTPSBTPH of Jember Regency and UD Restu Tani.

The first objective of the study was to determine the factors influencing farmers' decisions to purchase certified rice seeds of UD Restu Tani and analyze using logistic regression. Logistic regression analysis is used to analyze the relationship between the independent and the dependent variables which are dichotomous or binary (Riyanto, 2012). Variables that are considered influencing farmers' decisions to purchase certified rice seeds of UD Restu Tani include education, age, experience, land area, production, resistance to HPT, and seed quality. These variables were synthesized from Engel (1994) and a study conducted by Khoirunisa (2019). The following is the logistic regression equation.

$$Yi = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7D_1 + \beta_8D_2 + e$$

Notes:

Yi = Farmers' decisions to purchase certified rice seeds of UD Restu Tani (1= purchase; 0= purchase other brands)
B_0 = Constant
B_1-B_8 = Regression coefficient
X_1 = Education (Year)
X_2 = Age (Year)
X_3 = Land area (Ha)
X_4 = Experience (Year)
X_5 = Price (Rupiah)
X_6 = Production (Ton)
D1 = HPT resistance dummy (1= resistant; 0= not resistant)D2 = Seed quality dummy (1= premium; 0= regular)

The second research objective of the study is the attributes influencing farmers' decisions to purchase certified rice seeds (Aji et al., 2001; Ishaq, 2009; Rustanti 2015) that were analyzed using factor analysis. According to (Usman, 2013), factor analysis is a multivariate model utilized to decrease variables. The variables used are presented in Table 1. The variables used were given variable weighting using a Likert scale. The weighing scale used is 1 to 5 where 1 is strongly disagree and 5 is strongly agree.

According to (Usman, 2013), factor analysis consists of five stages of analysis, including (1) variable testing, with the criteria used are the Kaiser Meyer Olkin value > 0.5, the significance value of the Barlett Test of Sphericity < 0.05, and the Measure Sampling Adequacy value of 0.5; (2) Variable Reduction, with the criteria used, include the communalities extraction value of the variable > 0.5 and the total eigenvalue > 1; (3) Factor rotation, by using the varimax model rotation with the factor loading value of each variable > 0.5; (4) Correlation testing between factors; and (5) Naming factors.

Table 1. Attributes of Farmers' Decisions to Purchase Certified Rice Seeds

*Fac*tors	Attributes
Product quality	Productivity level (X_1)
	Germination power (X_2)
	Seed size (X_3)
	Planting age (X_4)
	Variety purity (X_5)
Product price	Availability of money to purchase (X_6)
	Seed storage costs (X_7)
	Price suitability with the product (X_8)
Service quality	Seed labels (X_9)
	Expired date (X_{10})
	Manufacturer certification permit number (X_{11})
	The way to store the seeds (X_{12})
	The way to plant the seeds (X_{13})
	Advice on packaging (X_{14})
Product availability	Certified rice seeds (X_{15})
	Desired varieties (X_{16})
	Desired brands (X_{17})

Source: Adapted from Aji et al., (2001) and Rustanti (2015).

RESULT AND DISCUSSION

Characteristics of Farmers as Consumers of Certified Rice Seeds

Characteristics of farmers provide an overview of the condition of farmers. Differences in farmer characteristics are considered to influence farmers' decisions to purchase certified rice seeds of UD Restu Tani. Characteristics are differentiated based on age, education, experience, land area, and land ownership status (Table 2).

Both rice farmers who purchase certified rice seeds of UD Restu Tani or other brands are in the 45-50-year age range, which is included in the productive age. This group of farmers is more responsive in obtaining new information and innovations and has a higher interest in performing farming activities because the purpose of their activities is to fulfill the needs of life and family.

The majority of respondents of 59 farmers have the last education at the elementary school level (SD). The education level will affect the courage of farmers in making decisions and taking risks (Theresia, Fariyanti, & Tinaprilla, 2016). A total of 36 farmers have experience in rice farming between 8-15 years. The more experience the farmers have, the better they would understand the need of using certified rice seeds.

The majority of respondents have land with medium size or between 0.5-1.9 Ha. The land area owned by farmers will determine the amount of input needed, including certified rice seeds.

The majority of farmers of 94 people owned the land by themselves. They only need to pay taxes for the land they own.
Farmers are also free to manage their land without worrying about making a profit or losing money every season, such as when managing leased land.

Factors Influencing Farmers' Decisions to Purchase Certified Rice Seeds of UD Restu Tani of Jember

Logistic regression analysis was employed to determine the factors influencing farmers' decisions to purchase certified rice seeds of UD Restu Tani. The test results of the logistic regression model can be seen in Table 3.

Table 2. Characteristics of Farmers as Consumers of Certified Rice Seeds in Jember Regency

Characteristics	Purchase UD Restu Tani Brand			Purchase Other Brands		
	Category	Total	%	Category	Total	%
Age	45-50 years	17	20	45-50 years	12	29.27
Education	Elementary school	43	50.59	Elementary school	16	39.12
Experience	8-15 years	24	28.24	8-15 years	12	29.27
Land area	Moderate (0.5-1.9 Ha)	46	54.12	Moderate (0.5–1.9 Ha)	18	43.9
Land ownership status	Owned by respondents	63	64.12	Owned by respondents	34	82.93
Total sample	85			41		

Source: Primary data processed, 2020.

Table 3. Logistics Regression Model Test Results

Testing Criteria	**Value**
Hosmer and Lomeshow Test	0.202
Negelkerke R Square	0.261
-2 Log Likelihood (step 0)	158.979
-2 Log Likelihood (step 1)	132.835

Source: Primary data processed, 2020.

The feasibility test of the model was performed by employing the Hosmer and Lomeshow Test (H-L) criterion. The H-L significance value was 0.202 (0.202 > 0.05), indicating that the model was feasible and could be used in analytical activities. The second test criterion was Negelkerke R Square which was used to determine the diversity of model variables. The results of the analysis show that the value of Negelkerke R Square was 0.261, indicating that the farmers' decisions to purchase certified rice seeds of UD Restu Tani was influenced by the diversity of variables of education, age, experience, land area, price, production, resistance to HPT, and seed quality by 26.1% and the remaining 73.9% were influenced by the diversity of other variables outside the model.

The Goodness of Fit Test was used to determine the effect of the independent variables on the dependent variable. The results show that the G value was greater than the Chi-square value (26.144 > 15.510), indicating that the independent variables jointly influence farmers' decisions to purchase certified rice seeds of UD Restu Tani.

The results of logistic regression analysis used a confidence level of 90% (10% significance). The results showed that three variables were significant in influencing farmers' decisions to purchase certified rice seeds of UD Restu Tani, including education, age, and quality of seeds. Meanwhile, the values of the variables of experience, land area, price, production, and resistance to HPT were not significant. The results of the Wald test analysis can be seen in Table 4.

Based on the results of the analysis, the logistic regression equation can be formulated as follows:

$$Yi = 4.629 - 0.16X_1 - 0.054X_2 + 0.02X_3 - 0.768X_4 + 0.0X_5 + 0.04X_6 + 0.0256D_1 + 1.263D_2 + e$$

Education

The variable of education had a significance value of 0.016 (0.016 < 0.05), indicating that the variable of education significantly influenced the farmers' decision to purchase the certified rice seeds. The regression coefficient value of -0.16 indicated that the education variable had a negative influence. The

odds ratio value of the variable of education was 0.825, indicating that an increase in farmers' education by 1 year would reduce the chances of farmers to purchase certified rice seeds of UD Restu Tani. The results showed that the majority of farmers had an elementary school education, indicating that the majority of the market for certified rice seeds of UD Restu Tani products had low education. Farmers with low education are commonly more risk-averse so that they tend to purchase widely used and slightly cheaper certified seeds. Therefore, the seeds of UD Restu Tani suit them. Farmers with higher education are more willing to take risks by purchasing or trying other brands, particularly hybrid rice seeds that are not commonly used by other farmers. Maghfirah et al. (2019) revealed that the higher the level of education of farmers, the higher their knowledge.

Age

The variable of age had a significant influence on farmers' decisions to purchase certified rice seeds of UD Restu Tani with a significance value of 0.067 (0.067 < 0.1). The variable of age had a negative influence on farmers' decisions. It was also related to the farmers' courage to take risks. Younger farmers tended to be more willing to take the risk of purchasing other seeds, particularly hybrid seeds which are not widely used by local farmers and are slightly more expensive. Meanwhile, older farmers preferred to use cheaper certified seeds of UD Restu Tani. The value of the odds ratio was 0.948, indicating that if the farmers' age increases by one year, their opportunity to purchase certified rice seeds of UD Restu Tani will decrease by 0.948 times. The results showed that the majority of respondents were in the productive age range. These farmers are more motivated to do profit-oriented farming to meet their needs every day (Theresia et al., 2016).

Experience

The significance value of the variable of experience according to the Wald test result was 0.382 (0.382 > 0.1), indicating that the variable of experience had no significant influence on farmers' decisions to purchase certified rice seeds of UD Restu Tani. The attitude of farmers will be greatly influenced by experience, whether it comes from personal experience, family, or friends (Junaedi, Setyawan, & Soepatini, 2017). Farmers who had quite a lot of experience in rice farming do not rule out the possibility to be older or were of non-productive age.

Table 4. Wald Test Results

Variables	B	S.E	*Wald*	Df	Sig.	Exp(B)
X1 Education (Year)	-0.16	0.066	5.815	1	**0.016	0.825
X2 Age (Year)	-0.054	0.029	3.357	1	*0.067	0.948
X3 Experience (Year)	0.2	0.023	0.764	1	0.382	1.02
X4 Land area (Ha)	-0.768	0.545	1.982	1	0.159	0.464
X5 Price (Rupiah)	0	0.000	0.623	1	0.43	1
X 6 Production (Ton)	0.048	0.067	0.522	1	0.47	1.05
D1 Resistance to HPT (0= resistant; 1= not resistant)	-0.256	0.453	0.318	1	0.573	0.774
D2 Seed quality (0= regular; 1= premium)	1.263	0.525	5.78	1	**0.016	3.535
Constant	4.629	1.452	10.177	1	0.001	102.362

Y = Decision to purchase
(0= Purchase other brands; 1= Purchase the UD. Restu Tani brand

Source: Primary data processed, 2020.

Notes: * significant at the 10% level of significance
** significant at 5% level of significance

Someone who belongs to the non-productive age group tends to find it difficult to accept technological innovations (Adawiyah, Sumardjo, & Mulyani, 2017). Farmers' experience had no significant influence in determining certified seeds because the use of certified rice seeds had been adopted by farmers in Jember for a long time.

Land area

The variable of the land area had a significance value of 0.159 (0.159 > 0.1), indicating that it did not significantly influence the farmers' decisions to purchase certified rice seeds of UD Restu Tani. Based on the characteristics of the consumers, it shows that farmers with a large land area or more than two hectares prefer not to buy certified rice seeds of UD Restu Tani. The land area owned by farmers would be taken into consideration by farmers in implementing innovation, which is by using hybrid rice seeds. Farmers revealed that the yield of hybrid seeds was higher than that of inbred seeds, but the price of the seeds was more expensive, ranging from IDR 120,000.00 to IDR 135,0000.00 per Kg. Studies conducted by Permasih (2014) and (Widiyanti, Baga, & Suwarsinah, 2016) also showed that land area did not affect farmers' decisions to purchase seeds because it is related to the application of innovation.

Price

The variable of price had no significant influence on farmers' decisions to purchase certified rice seeds of UD Restu Tani. Both the price of rice seeds of the UD Restu Tani brand and other brands was ranging from IDR 75,000.00 – IDR 85,000.00 for premium packaging or 5 Kg and IDR 100,000.00 – Rp. 125,000.00 for regular packaging or 10 Kg. Rice seeds are the most main and essential input in rice farming, thus farmers will pay whatever price is set for them as long as it is within an acceptable range. According to Prafithriasari and Fathiyakan (2017), the price is quite affordable for rice farmers. Farmers will agree to purchase rice seeds if the price is not higher by five times than ordinary rice seeds (Hadimartono, Sumarwan, & Sanim, 2017). Farmers in this case are more concerned with the tradition or practice of utilizing rice seeds that have been extensively utilized by local farmers rather than the price.

Production

The significance value of the production variable is 0.47 (0.47 > 0.1), indicating that the variable of production had no significant influence on farmers' decisions to purchase certified rice seeds of UD Restu Tani. Farmers are more concerned with the attributes of seed productivity followed by the price of grain (Syamsiah, Nurmalita, & Fariyanti, 2015). Farmers agree to purchase the rice seeds when the productivity level is higher than that produced by usual seeds (Hadimartono et al., 2017). The variable of production was not significant because the varieties used by each farmer were different from other farmers. Each variety also had different characteristics, including the compatibility with land conditions, weather, and resistance to HPT, which would affect production yields.

Plant pests and diseases resistance dummy

The variable of the HPT resistance dummy had a significance value of 0.573 (0.573 > 0.1), indicating that the variable did not significantly influence the farmers' decisions to purchase certified rice seeds of UD Restu Tani. The value of the odds ratio was 0.774, which tended to approach the value of 1, indicating that when the rice seeds were more resistant to pests and plant diseases, the chances of farmers to purchase were 0.774 times. According to some farmers, in the first planting season or during the research, the pests and diseases that attack were collapse disease, blast, leaf rust, leafhoppers, and rats. Unstable weather conditions also resulted in pest and disease attacks. According to the farmers, the attack occurred in only a few varieties with the resistant varieties being the Inpari and Mekongga varieties. According to Ramadhan (2013), seeds that are resistant to pests and diseases will influence the farmers'

decisions to purchase them by 97%. Farmers must often change the variety of rice seeds used to break the life cycle of pests in the field so as not to break the resistance of the seed varieties (Juanda, 2016).

Seed quality dummy

The significance value of the variable of seed quality with a significant level of 10% was 0.016 (0.016 < 0.1), indicating that it has a significant influence on the farmers' decisions to purchase certified rice seeds of UD Restu Tani. The odds ratio of the variable of seed quality showed the number of 3.535, indicating that the variable of seed had a positive value. Therefore, the rice seed quality offered was premium or 5 Kg packaging would increase the chances of farmers to purchase certified rice seeds of UD Restu Tani by 3.535 times compared to the ordinary seeds or 10 Kg packaging. The most influential factor in the farmers' decisions to purchase certified rice seeds is the quality of the seeds with a percentage value of 100% (Ramadhan, 2013). It revealed that segmentation of the quality of rice seed of UD Restu Tani products was believed to influence farm output and a significant factor in making decisions to purchase UD Restu Tani's products. Rice seeds of UD.

Restu Tani was a certified non-hybrid where the currently targeted production amount was 1000 tons per year. The varieties produced include way apo, cibogo, ciherang, logawa, situ bagendit, inpari 30, inpari 32, inpari 33, inpari 42, inpari 43, mekongga, and IR 64. Certified rice seeds that had passed the test would be packaged. Types of the packaging produced included 5 kg polyethylene packaging for premium quality, 10 kg packaging for regular quality, and cardboard packaging. The packaging had been equipped with information regarding seed labels, producer certification numbers, brands, seed storage methods, and seed planting methods.

Factors Influencing Farmers' Decisions to Purchase Certified Rice Seeds

Factor analysis is used to reduce variables or attributes influencing farmers' decisions into several factors that will be determined. There were 17 variables used in this study, including the level of productivity (X_1), growth power (X_2), seed size (X_3), planting age (X_4), variety purity (X_5), availability of money to purchase (X_6), storage costs (X_7), price suitability with the product (X_8), seed labels (X_9), expired date (X_{10}), manufacturer

Table 5. Factor Analysis Variable Test

Variables	Value
Kaiser-Meyer-Olkin Test	0.597
Sig. Barlett's Test	0.000
Measures of Sampling Adequacy	
Seed size	0.523
Planting age	0.717
Availability of money to purchase	0.564
Price suitability with the product	0.577
Seed labels	0.757
Expired date	0.620
Manufacturer certification number	0.577
The way to store the seeds	0.538
The way to plant the seeds	0.511
Advice on packaging	0.636
Availability of certified rice seeds	0.657
Desired varieties	0.569
Desired brands	0.604

Source: Primary data processed, 2020.

certification permit number (X_{11}), the way to store the seeds (X_{12}), the way to plant the seeds (X_{13}), advice on packaging (X_{14}), availability of certified rice seeds (X_{15}), desired varieties (X_{16}), and desired brands (X_{17}). The variables to be used must be tested for the variable feasibility using three criteria, including the Kaiser-Mayer-Olkin Test, Barlett's Test, and Measure of Sampling Adequacy.

The results of the variable feasibility tests can be seen in Table 5. The results of the Kaiser-Meyer-Olkin test showed a value of 0.605. This value is greater than the test criteria (0.597 > 0.5), indicating that the model formed was feasible and could be used in factor analysis. The results of Barlett's test showed a significant number of 0.000 (0.000 <0.05), indicating that there was a correlation between variables so that variable analysis can be carried out. The last, the test results using the measure of sampling adequacy revealed that only thirteen variables met the criteria (MSA > 0.5) so that only thirteen variables can proceed to the next stage of factor analysis.

The next stage of factor analysis was variable reduction which can be performed by looking at the commonalities and eigenvalues. The eigenvalue of each new factor formed should be more than 1. The cumulative eigenvalue was 83.96%, indicating that the farmers' decisions to purchase certified rice seeds were influenced by the diversity of the newly formed variables of 83.96%. Based on the results of the eigenvalues, five new factors were formed (Table 6). The third stage in factor analysis was factor rotation. The results of the analysis revealed that five new factors influence farmers' decisions to purchase certified rice seeds. The results of factor rotation can be seen in Table 6.

Factor 1. Planting technical information

The planting technical information factor based on the results of the analysis consisted of three variables, including the way to store the seeds, the way to plant the seeds, and packaging instructions. Variation of planting technical information factor in influencing farmers' decisions was 24.421%.

Table 6. Rotation of New Factors Influencing Farmers' Decisions to Purchase Certified Rice Seeds

Variables	Components				
	1	2	3	4	5
Seed size					0.849
Planting age					0.740
Availability of money to purchase				0.852	
Price suitability with the product				0.835	
Seed labels		0.978			
Expired date		0.986			
Manufacturer certification number		0.977			
The way to store the seeds	0.989				
The way to plant the seeds	0.990				
Advice on packaging	0.987				
Availability of certified rice seeds			0.788		
Desired varieties			0.898		
Desired brands			0.710		
Total eigenvalue	3.379	3.162	1.784	1.404	1.187
% of variance	25.993	24.320	13.726	10.802	9.128
Cumulative %	25.993	50.313	64.039	74.841	83.968

Source: Primary data processed, 2020.

According to some farmers, planting technical information is essential to include on the packaging of rice seeds considering that not all farmers have the same knowledge and experience in using seeds or farming activities. They found it helpful to have planting technical information listed on the packaging. Producers can also minimize the cost of the direct extension to farmers by including this information in seed packaging.

Factor 2. Product certification validity

The factor of product certification validity consisted of three variables, including seed labels, expiration date, and producer certification number. Seed labels describe essential information regarding seed products such as the producer, variety, packaging weight, test date, expired date, germination, water content, variety purity, and other variety mixes (CVL) in the field. Expired date is a crucial attribute and will determine seed performance (Ramadhan, 2013; Syamsiah, 2016; Syamsiah et al., 2015).

Factor 3. Availability of seed products

Availability of seed products consisted of the availability of certified rice seed products, seed varieties, and seed brands. Farmers would be satisfied when the product was easy to access (Rustanti, 2015).

The type of variety was a crucial attribute in farmers' assessment of the performance of rice seeds considering that each variety had different advantages. Farmers were more concerned with varieties than brands in deciding to purchase certified rice seeds. The varieties of rice available today are highly diverse, as well as certified rice seeds brands, making it easier for farmers to choose the seed varieties they want to purchase.

Factor 4. Seed product price

The factor of seed product price consisted of the availability of money to purchase and the price suitability with the product. Farmers stated that the current price of certified rice seeds was average, meaning it was neither too cheap nor too expensive. Competitive prices that are both affordable and in line with the advantages will influence a product's purchase choice (Kangile, Gebeyehu, & Mollel, 2018; Prafithriasari & Fathiyakan, 2017; Susdiarto, Priyono, & Swastuti, 2013).

Factor 5. Seed product quality

The seed product quality consisted of two variables, including the seed size level and planting age.

Farmers as consumers revealed that they preferred products of good quality because it would affect their income. When farmers utilize certified rice seeds, their output rises, and their revenue rises as well. Product quality also refers to the physical form of seeds such as seed size, where the size of certified rice seeds is more uniform because they have passed through a sorting mechanism done by the seed industry (Kangile et al., 2018).

The five newly formed factors would be sorted to decide the level of significance of each factor. Factors were sorted according to the average value of the loading factor for each newly formed factor. The results of the analysis revealed that the planting technical information factor was the most important in influencing farmers' decisions to purchase certified rice seeds with an average loading factor value of 0.988.

Planting technical information was only available on some types of seed packages. The availability of this information in seed packages would make it easier for farmers to utilize certified rice seeds although it was flexible. The second level of significance was the seed certification validity followed by product prices, seed product availability, and seed product quality.

Managerial Implications

The formation of factors influencing farmers' decisions to purchase rice seeds needs to be considered by rice seed producers. Therefore, farmers' needs will be met, resulting in satisfaction for the farmers. According to Rustanti (2015), consumer satisfaction is affected by several factors, including product quality, product prices, service quality, at-

titudes towards products, as well as costs and ease of obtaining products.

The results revealed that service quality was the most influencing factor in farmers' decisions to purchase certified rice seeds. A service like counseling provided by producers indirectly to farmers was considered essential by farmers. It is indicated by farmers' preference to purchase seeds with packaging containing technical information on the use of seeds. On the contrary, farmers have sufficient experience in farming activities and understand that the techniques are flexible.

The services provided can also be in the form of complete information (seed labels) on rice seed products. Seed labels serve as a guide for farmers in selecting certified rice seeds to purchase, and seed labels represent seed quality.

Several cases demonstrated that the seeds that were circulated and purchased by farmers did not match the seed labels, making the farmers feel disadvantaged. As a result, if seed producers wish to sustain and grow farmers' interest in purchasing certified rice seeds, they must pay attention to the issues above, particularly those linked to service quality.

CONCLUSION AND SUGGESTION

Conclusions

Factors that influenced farmers' decisions significantly to purchase certified rice seeds UD Restu Tani include education, age, and seed quality. Education and age had a negative influence, while seed quality had a positive influence. If the seed quality offered is premium or 5 Kg packaging, then it will increase the chances of farmers to decide to purchase certified rice seeds of UD Restu Tani. Thirteen attributes influencing farmers' decisions to purchase certified rice seeds were grouped into five new factors, including the factors of planting technical information, the seed certification validity, the availability of seeds, the seed price, and the product quality.

Suggestions

Seed producers need to fulfill the purchase attributes, especially those related to the inclusion of planting technical information on each seed package. If it is not possible, brochures, leaflets, or flyers can be provided which can later be placed in agricultural kiosks. Therefore, farmers who need this information can obtain it at the agricultural kiosk at the same time when they purchase seeds. Farmers are also expected to be more careful and ensure the information on the seed label before purchasing certified rice seeds. In addition, the government is expected to increase supervision related to certified rice seed production activities, particularly related to the inclusion of seed labels for each producer so that the number of seeds distributed is in accordance with the number of seeds registered for certification, considering that there are cases of circulating seeds that do not correspond the label.

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