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Level of Motivation and Adoption of Innovation at Pig Farming in Southwest Sumba Regency

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ABSTRACT

The development of pig farming aims to support the economy of the people in the Southwest Sumba Regency. Pigs in this area have a very high cultural value, so they have promising potential and prospects in the future. The problem is that the maintenance system is still semi-extensive and tends to be traditional. This situation can be related to the motive in trying and efforts to adopt an innovation. This study aimed to analyze the level of motivation and the factors that influence the adoption of innovation in raising pigs. The research method used a survey method with direct observation in the field. They are determining the area using the multistage cluster random sampling method obtained from sample sub-districts, namely Tambolaka District (Tambolaka City and Wee Londa) and South Wewewa District (Tena Teke Village and Delo). The research material was 120 pig farmers taken by purposive random sampling. The measured variables include the motivation to raise livestock using a Likert scale and factors influencing innovation adoption using multiple linear regression tests. The software used is Eviews 10. The study results show that: 1) Most of the pig breeders in Southwest Sumba Regency are based on high economic, social, and entertainment motives in pig farming. 2) The regression results show that the variables that have a significant effect on the level of adoption with a prob value below the significant level of 0.05 are the variables of motivation and access to information. While the variables that have no significant effect on the level of innovation adoption with a prob value above the significant level of 0.05 are the variables of age, education level, family dependents, livestock experience, number of livestock, and accessibility. This study concludes that business motives and adoption of innovations affect the success or failure of pig-rearing businesses in the Southwest Sumba district.

Key words: Motivation, Adoption of Innovation

INTRODUCTION

Pig farming is a type of livestock business generally in demand by the people living in Southwest Sumba Regency, both on a large and small scale. The reasons that make pig farming in the Sumba area a profitable business are 1) a profitable pig market, 2) it does not require a large area of land, 3) feed comes from household waste and commercial feed, which is readily available and 4) its status as an essential socio-economic animal for the Sumba people in general. Based on BPS Southwest Sumba data in 2019, the population of pigs stood at 4,300 in 2014 and 16,522 in 2015. Likewise, they were 50,273 in 2016 and rose to 78,502 in 2017. In 2018, the pig population was 97,893. Based on the population growth data above, the population growth rate of pigs (r) is 0.23% per year from the total population of pigs in NTT of 2,141,246. The projected population of pigs in 2021 is estimated to reach 181,432 heads. The increase in people should be supported by good production performance, reproduction of management and marketing by business actors, and support from the government, institutions, society, and the environment. Pigs have become part of the culture of the people of Southwest Sumba, one of their ancestors' social obligations passed down from generation to generation. The high socio-cultural function makes pigs very popular to be kept or used as a business in the Sumba area. In every household in the city and the village, a minimum of 1-5 pigs are usually kept. The number of pigs that are kept depends on the purpose of their maintenance. Pigs are not only intended to support the needs of the farmer's life but are also used as sacrificial livestock in traditional events such as death, dowry, parties, and family celebrations.

The demand for pigs in the Sumba area is high, especially from September to October, which is believed to be a sacred month where formal events are held. Demand also increases during harvesting and religious celebrations such as Easter, Christmas, Chinese New Year, and others. The price range of pigs at a weight of 60-80 kg with a maintenance time of 8-10 months is IDR 7-9 million rupiah. As for the weight of 100-300 Kg, the maintenance time is up to 1-2 years; it can be valued at IDR 15-20 million. Based on 2019 BPS data, the number of pig

slaughtering increases yearly. In 2015, there were 1,402; in 2016 there were 3,085; in 2017, there were 6,571, and in 2018, there were 8,492 pigs. It is supported by Ly (2016), who states that the higher the social status of a man or woman, the more belies or dowry, the more pigs are slaughtered, and the higher the value of a folk party. Pig farming is expected to support the increasing demand for meat and secure jobs for the ever-rising population. Business motives influence a person to raise livestock and also affect the business's productivity. Different motives cause the activity or behavior of other individuals. Motives are drivers that can trigger and direct individual behavior to get what they want. Individual differences are noticed due to differences in behaviors, which will indirectly affect their work (Jabal, 2001).

Innovation is an idea, action, or item considered new by someone. Whether the idea is new or not measured by the time interval since it was first used or discovered doesn't matter. At the same time, the adoption process occurs from the first time someone hears something new until the person adopts (accepts, applies, uses) the new one (Effendi, 2005). Based on the above background, this study aimed to determine the economic viability of the pig farming business in Southwest Sumba Regency and to analyze the level of innovation adoption about the characteristics of breeders. The results of this study are expected to provide an accurate and up-to-date contribution to the pig-raising business.

MATERIALS AND METHODS

The research has been carried out in Southwest Sumba Regency from December 2020 to March 2021. This research is descriptive and quantitative, describing a phenomenon of events, symptoms, and events occurring in a factual systematic, and accurate manner. Primary data was obtained through observation, Focus Group Discussion (FGD), and questionnaires. Secondly, the secondary data was obtained from various sources such as journals, reports, books, etc. Determination of the area/respondents used the multistage cluster random sampling method. The first stage of determining sub-districts with consideration of interaction zones (Bintarto, 1983) obtained two sub-districts: Tambolaka City as the city center and South Wewewa District as a rural area (rural area). The second stage of determining the village obtained 4 sample villages with deheads Tambolaka City consists of two villages (Tambolaka City and Wee Londa), South Wewewa District (Tena Teke and Dello). Furthermore, the determination of respondents obtained 120 respondents using the purposive sampling method.

Data Analysis

To measure farmers' motivation level, a Likert scale with four alternative answers with a value in the form of numbers was used. The answer is in the form of giving a score/weighting as follows: a. strongly agree = 4, b. Agree = 3, c. Disagree = 2, d. Disagree = 1. The average score is the total score of each variable or indicator statement item divided by the number of respondents (Sumantri and Muhidin, 2011).

$$\text{Average} = \frac{\text{Total score for each question}}{\text{Number of respondents}}$$

$$\% \text{ Score} = \frac{\text{average score}}{\text{maximum score}} \text{ x } 100$$

Regression analysis was used to determine the factors influencing innovation adoption in raising pigs in the Southwest Sumba Regency. This test was conducted to estimate the magnitude of the relationship of the independent variable to the dependent variable. The coefficient of the regression equation is calculated using the Eviews ten program. The form of the model used according to Sugiono (2010): $Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + ... + e$

Description:

Y	: Adopt Innovation
a	: Constant
b	: Regression coefficient
X_1	: Age
X_2	: Education level
X_3	: Family Dependents
X_4	: Number of Livestock
X_5	: Farming Experience
X_6	: Accessibility
X_7	: Information Facility
e	: Standard Eror

To determine the factors that have a real or no natural effect, the F test was carried out to assess the impact of each independent variable on the dependent variable simultaneously (together), and the T-test to determine the effect of the Independent variable on the dependent variable partially (alone) (Algifari, 2010).

RESULTS AND DISCUSSION

Respondents' General Conditions

Table 1. shows that pig farmers in Southwest Sumba Regency are aged between 40-49 years (28%) and 50-59 years (30%) with 2-<10 years of experience raising livestock (60%). Most pig farmers' education levels are high school graduates (63%), with the most dominant occupation being farmers (38%). Family members range from 1-4 (60%).

Table1 Characteristics of pig farmers in Southwest Sumba District

Description	Number
Age group<20 year	0
21-29 year	5
30-39 year	20
40-49 year	28
50-59 year	30
>60 year	17
Education Group	
Primary school	3
Junior high school	21
Senior High School	63
College	13
Occupation	
Farmer	38
Self-employed	18
civil servant	20
Transportation	14
Service	10
Trader	0
Experience of farming	
2-<10 year	60
≥ 10 year	40
Number of Livestock Ownership	
1-5	84
>5	16
Number of Family Members (person)	
1-5 (small)	60
>5 (big)	40

Source: 2021 Data Processing results

Pig Farming Business Motives in Southwest Sumba District

Farmer motivation is a condition that encourages someone to act to achieve their goals. Jabal (2001) states that individual differences produce different behaviors, which indirectly affect their work. The motivation of farmers in this study is grouped into three aspects: economic motivation, social motivation, and entertainment motivation. The division is intended to simplify various classifying types of motivation. Categorization is based on the motivation level score of pig farmers in Southwest Sumba Regency, namely 80%: high category, 60%: medium category, and 50%: common type. The distribution presentation of economic, social, and entertainment motives (Graph 1) shows that the strongest motivation to encourage farmers to raise pigs in Southwest Sumba Regency is the financial motive (86%) which is in the high category. Respondents raise pigs in the hope of meeting their economic needs and think that raising pigs can have a positive social impact. There is a desire to have and increase savings, namely the urge to have protection and increase the savings already owned. The livestock owned can be used as family savings, selling anytime. It is the opinion of Alam et al. (2014). They state that a high level of economic motivation means that farmers have high expectations to meet their financial needs, including the desire to meet the needs of family life. Social motives (78.12%) and entertainment (76.00%) are in the medium category. The social motivation that encourages farmers to be involved in pig farming activities is in the form of a desire to improve social status in the community. The positive social impact can strengthen the brotherhood between breeders to establish good cooperation. With good teamwork, respondents can exchange experiences and beneficial information for improving their livestock business. There is also entertainment motivation, namely a sense of enthusiasm or desire and a hobby or hobby to fill spare time.

Factors Affecting the Adoption of Innovation

Several factors influence the decision to adopt an innovation. These factors are related to the characteristics of the breeder. The X variables in this study are age, education level, family dependents, experience, livestock ownership, motivation, information facilities, and accessibility. Variable Y in this study is the adoption of innovation. The stage before performing the regression is testing the classical assumptions (Multicollinearity Test, Normality Test, and Heteroscedasticity Test). The purpose of this test is so that the independent variable as an estimator of the dependent variable is not biased. The results of the multicollinearity test can be seen in table 2 (Centered VIF column); it

can be seen that the VIF value is in the range of number 1 because the VIF value of the seven variables is not greater than 10 or 5, it can be said that there is no multicollinearity in the independent variables..

Table 2. Multicollinearity test results

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
Constant	0.036313	172.6379	NA
Age	2.98E-06	24.49232	1.126994
Education level	1.64E-05	7.637044	1.054392
Family Dependents	8.16E-05	7.137153	1.120958
Farming Experience	8.03E-06	10.41416	1.151201
Number of Livestock	4.36E-05	6.106834	1.037426
Accessibility	0.000609	14.80453	1.083460
Motivation	0.000645	53.91427	1.138998
Information Facility	0.001135	79.38641	1.172803

Source: Data Processing Results Using EVIEWS.10 Software (2021)

The decision on whether the residuals are normally distributed or not is simply made by comparing the calculated JB (Jarque-Bera) probability value with an alpha level of 0.05 (5%) Prob value. JB count (Figure 1.) is 0.423592> 0.05. So it can be concluded that the residuals are normally distributed, which means that the classical normality assumption has been met.

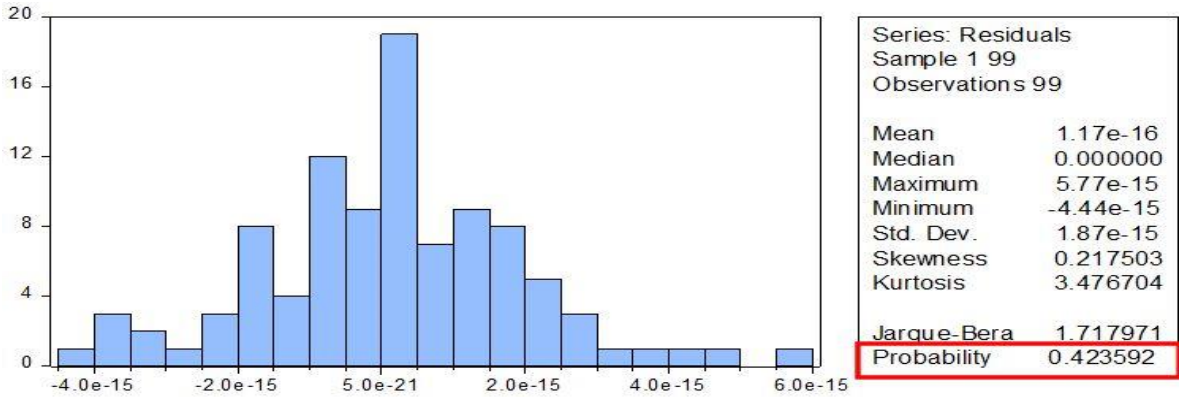

Figure 1. Data processing results using EVIEWS.10 Software (2021)

The decision of whether or not heteroscedasticity occurs in the linear regression model is made by looking at the Prob value of F-statistic (F count). Prob value. The calculated F is 0.0639, which is greater than the alpha level of 0.05 (5%), so that, based on the hypothesis test, the model does not have heteroscedasticity.

Multiple Regression Analysis

Based on the Multicollinearity test, the Normality test, and the Heteroscedasticity test, there is no violation of the classical assumptions. Next is multiple linear regression analysis.

Model Reliability Test (F Test)

The results of the F test can be seen in table 3 above. The F (Statistic) of 0.00000 is smaller than the significance level of 0.05. So it can be concluded that the estimated regression model is appropriate to be used to explain the effect of Age (X1), Education Level (X2), Family Dependents (X3), Livestock Experience (X4), Number of Livestock (X5), Accessibility (X6) and Frequency of Access to Information Channels (X7) on the dependent variable of Innovation Adoption (Y).

Table 3. Results of multiple linear regression

Variable	Coefficient	Std. Error	t-Statistic	Prob. **
Constant	0.037622	0.190559	0.197431	0.8439
Age	-0.001652	0.001727	-0.956327	0.3412
Education level	0.003255	0.004053	0.803160	0.4237
Family Dependents	-0.007985	0.009036	-0.883721	0.3789
Farming Experience	0.003592	0.002834	1.267677	0.2078
Number of Livestock	-0.002375	0.006602	-0.359760	0.7198
Accessibility	0.004680	0.024679	0.189633	0.8500
Motivation	0.050294	0.025400	1.980120	0.0504
Information Facility	0.837193	0.033697	24.84492	0.0000
R-squared ***	0.882277	Mean dependent var		3.418739
Adjusted R-squared	0.873044	S.D. dependent var		0.428840
S.E. of regression	0.152800	Akaike info criterion		-0.841773
Sum squared resid	2.381470	Schwarz criterion		-0.622081
Log-likelihood	55.71840	Hannan-Quinn criteria.		-0.752651
F-statistic	95.55501	Durbin-Watson stat		1.775239
Prob(F-statistic) *	0.000000			

Source: Data Processing Results Using EVIEWS.10 Software (2021)

*: F test; **: T test; *** : Determination coefficient

Regression Coefficient Test (T-Test)

Effect of age variable (X1) on innovation adoption

The T count of the independent variable Age (X1) is 0.341, which is greater than 0.05, so it can be interpreted that the independent variable Age (X1) has no significant effect on the dependent variable, the Innovation Adoption Rate (Y) at 5% alpha or 95% confidence level. The age factor has no impact on the adoption rate because, based on the results obtained in the field, there is no difference in the age of breeders who adopt and those who do not adopt. Some breeders are young but have adopted, and some are old enough to adopt. It is supported by the results of Makatita's (2013) research, which states that the farmer's age does not affect the scale of the business because the productive period of the farmer pays more attention to his farming business than the livestock business.

Generally, breeders have a high enthusiasm for adoption at a young age compared to older people who prefer traditions that have been carried out for a long time. It is in line with Soekartawi (2008) opinion, which states that the younger the age of the breeder, the more enthusiastic they are to want to know what they don't know, so they try to make suggestions from outreach activities more quickly. This statement is also supported by Prabayanti (2010) that a person of productive age usually has the spirit to be curious about things that are not yet known. In addition, age also affects a person's physical condition. Associated with the existence of innovation, someone at non-productive age will tend to find it challenging to accept creation.

Tulle et al. (2005), in their research, stated a different opinion, namely, the older a person is, the more able to show mental maturity, the wiser, the more able to reason, and the more tolerant of behavior that is different from his own views and behavior and the more able to control emotions and emotions. Other traits indicate intellectual and psychological maturity.

The effect of education level variable (X2) on innovation adoption (Y)

Prob value. T count of the independent variable Education Level (X2) of 0.423 is greater than 0.05 so that the separate variable Education Level has no significant effect on the dependent variable Adoption of Innovation (Y) at 5% alpha with a 95% confidence level. Based on the results obtained, the education variable is not significant because the education of farmers in Southwest Sumba Regency is mostly only at the end of elementary school. However, some breeders have received education up to university, but it is not enough to encourage farmers to adopt innovations in raising pigs. The level of education farmers receive does not guarantee that they will adopt innovations because there is no difference between breeders who adopt and those who do not assume in terms of education. Mardikanto (2009) believes that a person's education level will instill an attitude towards using more modern agricultural practices.

Those with relatively high education are faster in carrying out counseling recommendations. Low levels of education generally do not like innovation, so the mental attitude to increase knowledge, especially about animal husbandry, is lacking. This opinion is also supported by Soekartawi (2008) that those with higher education are relatively faster in implementing innovation adoption. The level of formal education owned by farmers will show the knowledge and broad insight for farmers and the statement of Citra (2010) where an adequate level of education will certainly impact the management ability of the livestock business they are engaged in.

These results are not to the findings of Satria et al. (2007); namely, there is a significant relationship between the level of formal education and the level of adoption with a 95% confidence level. The reality on the ground shows that a high level of education for farmers will make them understand more about technology and its application well. Furthermore, Sari (2014) added that the level of education also affects the ability to think, so it will affect the development and improvement of living standards.

Effect of family-dependent variable (X3) on innovation adoption (Y)

Sumbayak (2006) states that the number of family members will influence farmers' decisions. Because the more the number of dependents in the family, the more burdens a farmer has to bear. The number of family dependents is one of the economic factors that must be considered in determining income to meet their needs.

The T count of the independent variable family dependents (X3) of 0.378 is more significant than 0.05 so that the independent variable Livestock Experience has no significant effect on the dependent variable Adoption of Innovation (Y) at 5% alpha with 95% confidence level. The number of dependents in the family does not have a significant relationship with the level of adoption of innovation in raising pigs. This is supported by the situation in Southwest Sumba Regency, where most farmers have 4-6 dependents (medium category). The more the number of dependents of the family or the more family members of the farmer, the more the farmer wants to advance his livestock business by utilizing the number of family workers he has to get better results to meet all the needs of his family members. It

Soekartawi (2008) states that the number of dependents in the family is one of the economic factors that need to be considered in determining income to meet their needs. This statement is also supported by Sumbayak (2006), who states that the number of family members will influence farmers in making decisions because the more the number of dependents in the family, the more burdens the family must bear can encourage him to adopt an innovation.

The effect of husbandry experience variable (X4) on innovation adoption (Y)

The T count of the independent variable Animal Husbandry Experience (X4) of 0.207 is greater than 0.05 so that the independent variable Livestock Experience has no significant effect on the dependent variable Adoption of Innovation (Y) at alpha 5% with a 95% confidence level. Based on the results obtained, the average experience of raising livestock in Southwest Sumba Regency is included in the very experienced category. Febrina and Liana (2008) stated that the long experience of raising livestock indicates that the knowledge and skills of farmers in livestock rearing management have better abilities. This is different from the reality in the field that experienced breeders are still relatively low in terms of innovation adoption. This is because most breeders in Southwest Sumba Regency prioritize their long-standing tradition of raising their livestock, making it difficult to accept innovation.

So whether or not the farmer has been involved in the livestock business does not guarantee that the breeder will adopt the innovations offered. This opinion is contrary to the findings of Murwanto (2008), who said that a long experience raising livestock will make farmers more careful in their efforts and can correct deficiencies in the past. Furthermore, Iskandar and Arfa (2007) stated that experience is a very decisive factor in the success of a business; with experience, breeders will obtain precious guidelines for obtaining future business success.

Effect of variable number of livestock (X5) on innovation adoption (Y)

The T-count the independent variable Number of Livestock (X5) of (0.719) greater than 0.05, so it can be said that the separate variable Number of Livestock has no significant

effect on the dependent inconsistent Adoption of Innovation (Y) at alpha 5% with 95% confidence level. Based on observations, the average number of livestock owned by respondent farmers ranges from 1-5 heads and is small in scale. For small-scale businesses, farmers are reluctant to apply the latest innovations because implementing an invention requires additional costs. Soekartawi (1988) adds that many new technologies need large-scale operations and high economic resources for adopting innovations, so the farm scale's size is always positively related to the adoption of innovations. This is the opinion of Wahdjosumidjo (2011), who states that a person's desire to produce (production) is very dependent on the specific goals he wants to achieve and the perception of actions to achieve a goal.

Effect of accessibility variable (X6) on innovation adoption (Y)

The T count of the independent variable accessibility (X6) of 0.850 is greater than 0.05 so the variable accessibility has no significant effect on the dependent inconsistent Adoption of Innovation (Y) at alpha 5% with a 95% confidence level. Regional accessibility is a critical factor that has an essential role in supporting or hindering the success of pig farming. The indicators of regional accessibility in the research location are determined, among others, the ease of farmers to the road, sources of capital, markets, and technology related to the adoption of innovations. Based on observations, regional accessibility does not affect farmers in adopting innovations. This is evidenced by farmers whose close to roads, markets, sources of capital, and technology do not all apply innovations in raising pigs. On the other hand, some farmers have implemented innovations because, for farmers, these innovations are beneficial to the success of their business. Innovations considered manageable, do not require additional costs and capital, and can be done without guidance from others are considered solid reasons for a farmer to adopt the innovation.

Farmer Motivation

The T-count of the independent variable farmer motivation (X7) is 0.054, which means the matter is not greater than 0.05, so the autonomous variable farmer motivation has a very significant effect on the dependent inconsistent Adoption of Innovation (Y) at alpha 5% with a 95% confidence level. The fact in the field is that the higher the level of motivation of farmers, the higher the level of technology adoption they apply. With a high explanation to keep trying to get better results from previous harvests and exceed the results obtained by others, the farmer will use the technology as well as possible, by what is recommended.

This study's results are from the effects of research by Komara (2005), which explains a real relationship between motivation and technology adoption. It was also explained that if the work motivation of farmers increases, the tendency to apply technology to their livestock business will also increase. However, this study's results are not similar to Juita's (2005) research, which explains that motivation is not significantly related to the level of technology adoption. It is also clarified that farmers with higher work motivation cannot be sure that the application of technology will be better than farmers with low motivation levels.

Effect of Information Channel Variable (X8) on Innovation Adoption (Y)

The T-count of the independent variable Frequency of Information Channel Access (X7) of 0.0000, which is smaller than 0.05, so the independent variable Frequency of Information Channel Access has a very significant effect on the dependent variable of Innovation Adoption (Y) at alpha 5% with 95% confidence level. This means that the availability and ease of access to information, such as exhibitions/expositions, demonstrations, internet discussions, and others, will increase the chances of adoption. The information available and easily obtained by farmers will improve farmers' knowledge/insight and skills, while limited information can lead to low adoption. This is in line with the theory that communication channels influence the decision of farmers trying innovations to continue implementing or discontinuing the use of these innovations.

The support factor for extension workers, government, academics, and others is a factor that also determines the speed and slowness of technology adoption. Regular meetings with farmer groups in each village and frequent contact with extension workers, attending courses/training, and field demonstrations also have a role for farmers in adopting innovations. It is in line with the opinion of Mardikanto (1996), who states that if the invention is relatively challenging to convey through the mass media or the target has not been

able to utilize the mass media, the innovation delivered through interpersonal media will be adopted more quickly by the target community. The more often farmers access communication channels to obtain information related to innovations in pig rearing, the their knowledge of farmers about these innovations will be higher. This statement is supported by the opinion of Rushendi et al. (2016), which state that the increasing use of interpersonal communication media through the media of lectures, dialogues, and demonstrations of results will increase farmers' opportunities to adopt innovations.

Determination Coefficient

The data processing results show that the value of the coefficient of determination (Adjusted R-Square) is 0.888. It illustrates that the proportion of the correlation effect between the independent variables Age (X1), level of education (X2), Number of family dependents (X3), farming experience (X4), number of livestock (X5), accessibility (X6) and means of information (X7) on the dependent variable the Adoption Rate (Y) of 0.88 or 88% which means, the independent variable in the regression model 88% influences the dependent variable, the remaining 12% is influenced by other variables not included in the model.

CONCLUSION

Based on the study's results, it can be concluded that most breeders in Southwest Sumba Regency raise pigs based on economic, socio-cultural and entertainment motives. The main priority is the financial motive. The regression results show that age, education level, number of family dependents, length of business, family dependents, accessibility, and number of livestock have no significant effect on the adoption of innovation in raising pigs in Southwest Sumba Regency. In contrast, motivational factors and information facilities have a powerful impact on innovation adoption.

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