TIDAL LAND RICE FARMERS' DECISION MAKING ON FORMAL AND NON-FORMAL CREDITS IN BANJAR REGENCY OF SOUTH KALIMANTAN, INDONESIA

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ABSTRACT
Indonesia as a country with the main staple food is sourced from rice, but in recent years has experienced a decline in rice production. The decline is not only at the national level but also at the provincial and district levels. One of the problems of the agricultural sector from the past until now is in terms of access to capital, because the background of farmers is diverse so that there are farmers who have sufficient capital and there are still very many farmers who have difficulty in terms of this capital. Therefore, this study was conducted to identify and analyze more deeply what factors influence the decision making of rice farmers in tidal lands on capital, especially formal credit and non-formal credit in South Kalimantan, especially Banjar Regency. The site selection was deliberate in Bekambat and Handil Purai villages, which are villages with tidal land and farmers who farm rice and many take credit. The study respondents were randomly selected as 80 farmers, 31 farmers who took formal credit and 49 farmers who took non-formal credit. Data analysis completed using logistic regression with the help of SPSS 27 program. As a result of the Goodness of Fit test, the model used is precise and can explain the data. Then simultaneously exert a significant influence on the response variable. Partially, of the 9 predictor variables, only 2 variables had a significant effect, namely the variable number of family members (X_3) with a significance value of 0.078 and the large variable of loan amount (X_5) with a significance value of 0.018. Other variables such as age, education, farming experience, loan interest, land area, land status and income do not have a significant effect on farmers' decision making.

KEY WORDS
Formal credit, non-formal credit, rice farming, tidal land, logistics.

Indonesia is a country with the main staple food of its people is rice sourced from rice. In 2023, the rice harvest area is estimated at 10.20 million hectares with rice production of around 53.63 million tons of dry milled grain (GKG). This value when converted into rice for food consumption of the population is estimated at 30.90 million tons (BPS, 2023). This number has decreased when compared to 2022, rice production decreased by 2.05% or equivalent to 1.12 million tons. South Kalimantan as one of the provinces in Indonesia which is a rice producer outside Java and Sumatra. The contribution of rice from South Kalimantan in 2022 is 873,130.27 tons, or 1.59% of rice production in Indonesia. However, when compared to production in the previous year (2021), there was a significant decrease of 14.08%. This is in line with the decrease in harvest area by 11.31% coupled with long floods and pest attacks and other factors (BPS, 2023).

Banjar Regency is the second region with the highest rice production in South Kalimantan Province after Barito Kuala Regency, in 2022 production reached 141,592.25 tons. This figure, as at the provincial level, also experienced a considerable decrease, amounting to 27,570.94 tons of rice (19.25%) compared to the previous year (BPS, 2023). Conditions like this need special attention because there are many factors that cause the decline. One of the problems is in terms of agricultural capital. Banjar Regency is an area prone to flooding and most of the land is tidal land so there are still many farmers who only plant rice once a year. Income from the previous harvest is usually used for daily needs and other consumptives, this causes capital for the next planting season to be less or exhausted and requires loans or credits to keep the farm running.

Capital is one of the important production factors in agricultural business. However, in terms of business operations, not all farmers have sufficient capital for their farming. This then makes farmers who have difficulty finding access to finance so that they can still farm. Farmers who are mostly in rural areas can only depend on microfinance in their areas, the financing is divided into formal and non-formal credit. Based on these facts, it is important to analyze what factors underlie farmers' decision making in taking credit for rice farming in tidal land, Banjar Regency, South Kalimantan (Pratiwi et al., 2019).

METHODS OF RESEARCH

The research was conducted in Banjar Regency as the third highest rice producing area in South Kalimantan, besides that this district is also the second area with tidal land area in South Kalimantan. Banjar Regency has close access to the capital so that information related to formal financing is more abundant and easy to receive. The purposive selection of research sites is to choose sub-districts and villages with the largest tidal land, the largest rice production and farmers who take a lot of loans for rice farming. The research was then devoted to two villages in two sub-districts, namely Bekambat Village in Aluh-aluh District and Handil Purai Village in Beruntung Baru District. The respondents of this study were selected by a simple random sampling method totaling 80 farmers, because there is no official data related to farmers who take microfinancing.

The data obtained are then processed and analyzed descriptively using Logistic Regression to analyze how the relationship occurs between the response variable (y) which is dichotomous and the predictor variable (x) which is polychotomous (Hosmer and Lemeshow, 2000). This model is commonly used in situations where there are two alternative answers, in this case related to microfinance, namely formal credit and non-formal credit. The logistic regression equation can be written as follows:

$$\pi(x) = \frac{e^{\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \cdots + \beta_n X_n}}{1 + e^{\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \cdots + \beta_n X_n}}$$

Then it is converted into a form with logit transformation:

$$Y = \ln\left[\frac{P}{1-P}\right] = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \cdots + \beta_n x_n$$

The response variables and predictor variables of this study are:

Table 1 – Variables used in the study

N	Variable		Symbol
1.	Types of Financing	Response	Y
2.	Age	Predictor	X1
3.	Education	Predictor	X2
4.	Family Members	Predictor	X3
5.	Farm Experience	Predictor	X4
6.	Loan Amount	Predictor	X5
7.	Loan Interest	Predictor	X6
8.	Land Area	Predictor	X7
9.	Land Status	Predictor	X8
10.	Income	Predictor	X9

The *Goodness of Fit* (GoF) test uses the *Hosmer and Lemeshow tests,* This test follows the spread X^2 with free degree *p, H_0 is rejected if* the p value is less than α (0.05). Conversely, if the *p* value is greater than α, it can be concluded that the model is suitable (Hosmer and Lemeshow, 2000).

Simultaneous parameter estimation testing is to use the Likelihood Ratio test or use the G Test. The purpose of this test is essentially to see if there is an influence of predictor variables simultaneously on response variables. The statistical test G follows the *Chi-Square*

spread with the degree of freedom p. H0 is rejected if the *p value* < α (0.05), meaning that by including the predictor variable in it it can be concluded that there is at least one variable that affects the response variable (Raharjanti and Widiarti, 2012).

Partial testing used *the Wald* test, hypothesizing:

- H_0: $\beta 1 = \beta 2 = \beta 3 = ... \beta n$ (no influence of predictor variables together on response variables);
- H_1: $\beta_i \neq 0$; i=1-9, (at least one predictor variable affects the response variable).

This test follows a spread of X^2 with free degree p, H_0 *is rejected when* the *p value* is less than α (0.05), which means that the predictor variable partially affects the response variable.

The interpretation of the coefficient is based on the *coefficient of odds ratio*. Odds ratio is a comparison of the probability of occurrence or non-occurrence of an event, the value is used to see how much the predictor variable tends to the response variable (Pampel, 2000).

RESULTS AND DISCUSSION

The characteristics of respondents became a predictor variable in the study, because each farmer has a different character and this affects farmers' decisions or actions for their business. The characteristics reviewed are in terms of age, farming experience, number of family members and education. Respondents in this study for farmers who took formal credit amounted to 31 farmers and farmers who took non-formal credit as many as 49 farmers. Age is one of the factors that influence farmers in carrying out agricultural activities, both in terms of decision making to their performance. If farmers are at a productive age, then their physique will be stronger to work and make the labor costs incurred be little or even non-existent, as well as other activities. The distribution of respondent farmers by age can be seen in Table 2.

Table 2 – Characteristics of research respondents

No.	Characteristics of Respondents	Average		Information
		Formal credit	Non-formal Credit	
1	Age	47.8 years	48 years old	51-60 years = 31.25% (25 people)
2	Farm Experience	19.4 years	18.2 years	11-20 years = 35% (28 people)
3	Education	7.6 years	8.1 years	0-6 years = 45% (36 people)
4	Family Members	3.8 people	3.8 people	4 people = 42.5% (34 people)
5	Land Area	1,970 hectares	1,444 hectares	0-1 hectare = 42.5% (34 individuals)
6	Land status	Rent	Rent	Rent = 77% (62 persons)
7	Income	IDR 26,454,881	IDR 18,795,131	Average Rp. 21,763,284
8	Loan Amount	IDR 11,870,968	IDR 5,428,571	Average Rp. 7.925.000
9	Loan Interest	IDR 1,075,484	IDR 458,367	Average Rp. 697.500

Source: Data processing, 2023.

The average age of farmers in the study area who took formal and non-formal credit was 48 years, with the youngest age being 26 years and the oldest being 78 years old. The largest distribution of respondents was in the age range of 41-50 years for farmers who took formal credit, and 51-60 years for farmers who took non-formal credit. Overall, in the study area, 31.25% of farmers aged 51-60 years or as many as 25 people from 80 respondents. The majority of respondents studied are still within the productive age limit but are dominated by the elderly or aged group. This age is closely related to farming experience, because the older a person is, the more experience he will have.

The average farming experience of respondents in the research area as a whole was 18.67 years, with the lowest farming experience at 3 years and the highest at 50 years. The largest percentage is 35% or as many as 28 people have farming experience for 11-20 years. The average number of farming family members is 4 people; the percentage is 42.5% or equal to 34 out of 81 people. The smallest number of family members is 2 people, and the largest is 6 people. The condition of education at the research location although the average length of education is 8 years, the highest number is in the range of 0-6 years, which is as many as 36 farmers or 45% of all respondents. Based on these data, as many as 3 farmers

have never received formal education at all and 3 farmers are also scholars.

Table 2 also provides additional information related to land area, land status, income, loan amount and loan interest. The majority of farmers in the research area are still 0-1 hectares with lease status, which is 62 farmers, and the rest are self-owned by 18 farmers. The average income of rice farmers in tidal land is Rp. 21,763,284,-, when viewed in Table 2 there is a significant difference between the income of farmers who take formal and non-formal credit. The difference is also very visible in the size of the loan and loan interest.

Farmer financing in the research area comes from own capital and also assistance from microfinance both formal and non-formal credit. Financing institutions to take formal credit include Bank Rakyat Indonesia (BRI), Bank Negara Indonesia (BNI) and private savings and loan cooperatives. As for non-formal credit, namely through agricultural kiosks / shops, agricultural product traders, loan sharks and also relatives / neighbors. The research area is an area close to the capital so that information on access to capital is easy to obtain. The results of interviews with farmers who took non-formal credit, it turned out that many did not want to borrow from formal institutions because they thought that procedures in formal institutions were difficult and slow in disbursement compared to non-formal institutions. In addition, farmers who take non-formal credit only borrow a small amount therefore prefer to go to non-formal institutions that have faster procedures. In non-formal institutions, although interest is higher, farmers do not mind because they can get money easily and quickly (Ashari, 2009).

Factors influencing the decision-making of rice farmers on tidal lands in formal and non-formal credit selection were analyzed by logistic regression using SPSS 27. The predictor variables include age (X_1), education (X_2), family members (X_3), farming experience (X_4), loan amount (X_5), loan interest (X_6), land area (X_7), land status (X_8) and income (X_9), from the calculation obtained the following equation:

$$Y = \ln\left[\frac{P}{1-P}\right] = -31,731 + 0,045X_1 - 0,279X_2 + 3,409X_3 - 0,303X_4 + 0,000X_5 + 0,000X_6 - 6,549X_7 - 0,954X_8 + 0,000X_9$$

Previously, the model goodness test was carried out, then tested simultaneously and also partially on the predictor variables. The first test is the *Goodness of fit* (GoF) test or *Hosmer and Lemshow* test, the model is said to be appropriate if there is no significant difference between the model and the observation value. From the results obtained the value of Chi-Square Hosmer and Lemshow is 0.229 with a significance value of 0.992, when compared to $\alpha = 5\%$ (0.05) then the value obtained is greater than α. This shows that the logistic regression model is able to explain the data and there is no difference between the model and the observation value.

Table 5 – Results of Partial Test Logit Analysis

Predictor	Coef	SE Coef	Wald	P	Odds Ratio
Age (X_1)	0,045	1,625	0,002	0,787	1,056
Education (X_2)	-0,279	0,478	0,342	0,559	0,756
Family Members (X_3)	3,409	1,936	3,100	*0,078	30,226
Farm Experience (X_4)	-0,303	0,193	2,465	0,116	0,739
Loan amount (X_5)	0,000	0,000	5,619	*0,018	1,000
Loan Interest (X_6)	0,000	0,000	0,284	0,594	1,000
Land Area (X_7)	-6,549	4,428	2,187	0,139	0,001
Land Status (X_8)	-0,954	2,938	0,105	0,745	0,385
Income (X_9)	0,000	0,000	2,028	0,154	1,000
Constant	-31,731	14,307	4,919	0,027	

Source: Data processing, 2023.

Then to assess the ability of the independent variable (response) to explain the dependent variable (predictor) used the value of *Cox &; Snell R-Square* or *Nagelkerke R Square*. Based on the calculation results, a value of 0.678 was obtained. This means that farmers' decision making in taking formal and non-formal credit of 67.8% can be explained by existing predictor variables and the remaining 32.2% can be determined by other variables outside the model.

Furthermore, to find out whether the predictor variable simultaneously affects the response variable, a G test was carried out. Based on the results of the analysis with the omnibus test, the model coefficient obtained a Chi-square value of 90.648 with a significance value of 0.000. The value is compared with α = 5% (0.05), the result is that if the analysis value is < α then all predictor variables simultaneously have a significant effect on the response variable.

Based on partial testing (Wald Test) shows that the factors that significantly affect the decision making of rice farmers in tidal land on formal and non-formal credit in South Kalimantan are the number of family members (X_3) and the loan amount (X_6) with α = 10%. Conversely, other predictor variables did not have a significant effect on farmers' decision making. More details can be seen in Table 5.

The age variable (X_1) wald value is 0.002 < the value X^2 table 2.71 at α = 10%. This shows that this age variable cannot explain farmers' decision-making regarding formal and non-formal credit for their farms. Then when viewed from the significance value of 0.787 > α = 10%, it can be concluded that age does not affect the response variable, namely taking farmer credit. This result is in accordance with research (Pratiwi et al., 2019) which also states that age does not affect the decision making of horticultural farmers in financing their farms. Age does not reference or reflect farmers' experience in terms of credit in study area.

The education variable (X_2) also has no effect and cannot explain the decision making of farmers in taking credit for their farms. the wald value is 0.342 < the value of X^2 table 2.71 in α = 10% and the significance value is 0.559 > α = 10%. This result contradicts research conducted (Pratiwi et al., 2019) which states that education affects credit taking because with good education farmers become able to process information and think carefully to take credit that is more appropriate and good for their farming. In this educational research area does not make a reference to taking formal or non-formal credit, all ages and levels of education can take credit for their farming.

The variable number of family members (X_3) can explain the response variable, can be seen from the value of wald 3.100 > the value of X^2 table 2.71 at α = 10 %. When viewed from the significance value of 0.078 < α = 10%, it can be concluded that the number of family members influences the decision making of rice farmers in tidal lands towards formal and non-formal credit. The odds ratio in this variable is 30.226, this figure is in the form of a positive coefficient which means the number of family members has a positive relationship with farmers' decision making to take formal and non-formal credit.

As the number of family members increases, the decision to take formal credit will increase by 30,226 times. When related to the conditions in the research area, more and more members in a family, they need a lot of capital for their farming because the money from the previous farm has been used for daily living needs. In addition, South Kalimantan, especially in the research area, still holds the tradition of many children having a lot of sustenance, so that the number of family members is generally the addition of children. This finding is not in accordance with research (Wati, 2015), showing that the number of family members has a negative coefficient, meaning that more family members will make the credit taken decrease because there is already a guarantee of capital availability from many of these members who may work in other sectors.

Farm experience (X_4) has no influence on farmers' decision-making on formal and non-formal credit in the study area. This can be caused by various factors, but based on the field results of farmers who have been farming for a long time > 30 years, there are only a few of them, as many as 12 farmers. The farmer is also elderly and because they are experienced, they can manage their farm easily. As for farmers whose experience < 30 years, in the research area in terms of taking credit more freely and the majority are influenced by family factors, and so on. In addition, from formal and non-formal credit parties in the research area, no one provides agricultural experience requirements for credit taking. This result is contrary to research from (Wati, 2015), in his research there is an influence in terms of farming experience, but it has a negative coefficient because the more experienced a farmer is, the better he will manage his farm both in terms of capital so that he does not need credit anymore.

The variable loan amount (X_5) can explain the response variable, can be seen from the wald value of 5.619 > the value of X^2 table 2.71 at α = 10%. When viewed from the significance value of 0.018 < α = 10%, it can be concluded that the amount of loans affects the decision making of rice farmers in tidal lands on formal and non-formal credit. The odds ratio in this variable is 1,000, this figure is in the form of a positive coefficient which means that the amount of loans has a positive relationship with farmers' decision making to take formal and non-formal credit. The greater the loan taken, the decision of farmers to take formal credit will be greater by 1,000 times compared to taking non-formal credit. This is in accordance with the situation in the field, because the majority of farmers who take formal credit are farmers who want to take large amounts of credit. Meanwhile, farmers who want to borrow small amounts of money quickly prefer non-formal credit. Non-formal institutions such as loan sharks can actually credit in large quantities, but respondent farmers are afraid of the risk of not being able to pay or increase interest rates. Then if you borrow from relatives, it is also rude if the amount is too much.

The loan interest (X_6) wald value is 0.284 < the value X^2 table 2.71 at α = 10% which means that it cannot explain the response variable. Then when viewed from the significance value of 0.594 < α = 10% does not affect farmers' decision making in taking formal and non-formal credit because both types of credit both have interest and farmers realize that the loan interest is a return for the loan they make. In addition, loan interest on formal loans in the study area is flat or does not change interest rates, as well as non-formal loans have no interest rates too high so that loan interest is not a problem for farmers in terms of taking credit as a result after calculations are made there is no significant influence on the response variable.

Land area (X_7) also does not significantly affect formal and non-formal credit-making decisions when viewed from the significance value of 0.139 < α = 10%. This is not in accordance with some studies that state that the area of land affects credit taking, because with large land, large capital is needed so that credit will also be increased. However, based on the results of this processed field, it turns out that farmers in the study area did not make the land area their reason for taking formal and non-formal credit. Likewise, formal and non-formal credits also do not make land area a condition for taking credit.

The status of the land (X_8) wald value is 0.105 < the value of X^2 table 2.71 at α = 10% which means that it cannot explain the response variable. Then when viewed from the significance value of 0.745 < α = 10% does not affect farmers' decision making in taking formal and non-formal credit. Of the 80 respondents, as many as 18 farmers have their land status as their own and the rest are not their own in this case is rent, maybe this is one of the reasons land status has no influence on farmers' decisions. This land status has no effect also due to one of them because in the research area the status of land ownership is not used as a condition in taking credit. Farmers who want to take credit are farmers who have been surveyed and assessed in terms of the correctness of their residence and place of business, even now it is very facilitated in terms of credit, namely without collateral and flat interest rates. So that from these reasons, farmers are free to take credit for their farming, either through formal or non-formal credit.

Income (X_9) does not affect farmers' decisions in choosing formal and non-formal credit, it can be seen from the wald value of 2.028 < X^2 table value of 2.71 at α = 10% and the significance value of 0.154 < α = 10%. This is because farm income always changes depending on various things, so this income cannot be used as a reference or benchmark in choosing formal and non-formal types of credit.

CONCLUSION

Based on the characteristics of respondents in the study area, the average age of farmers who took formal and non-formal credit was 48 years, with the youngest age being 26 years and the oldest being 78 years old. The average farming experience of respondents in the research area as a whole was 18.67 years, with the lowest farming experience at 3 years and the highest at 50 years. The level of education is still low with the largest distribution

being at 0-6 years which is 45%, with an average number of family members of 4 people. The majority of land status in the study area is leased or not owned by them and the largest land area is in the range of 0-1 hectare.

Financing institutions in the research area are divided into formal loans such as banks and cooperatives, then non-formal loans including kiosks/shops, agricultural product traders, loan sharks and relatives. Factors that influence the decision making of rice farmers in tidal land on formal and non-formal credit include age (X_1), education (X_2), number of family members (X_3), farming experience (X_4), loan amount (X_5), loan interest (X_6), land area (X_7), land status (X_8) and income (X_9).

The Goodness of fit *test* stated that the model was correct and 67.8% could explain the data, and then simultaneously tested a significant effect on farmers' decision making in taking formal and non-formal credit. After that was tested partially, of the 9 predictor variables, only 2 had a significant effect on farmers' decision making to take formal and non-formal credit, namely the variable number of family members (X_3) with a wald value of 3.100 > X^2 table value of 2.71 at α = 10 % and when viewed from the significance value of 0.078 < α = 10%. Another variable is the loan amount (X_5) with a wald value of 5.619 > a value of X^2 table 2.71 at α = 10% and a significance value of 0.018 < α = 10%.

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