

The Influence of Land Area, Production Costs, Pond Farming Experience and Pond Farmer Groups on Fish Farmers' Income in Pucangtelu Village, Kalitengah District, Lamongan Regency

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Abstract

This research aims to determine and analyze the partial and simultaneous influence of land area, production costs, pond farming experience, and pond farmer groups on the income of fish farmers in Pucangtelu Village, Kalitengah District, Lamongan Regency. This research uses a quantitative approach by collecting data obtained through structured interviews. The total sample was 90 respondents using the Slovin method. The analysis technique used is multiple linear regression analysis. The results of this research show that the variables of land area and production costs have a positive and significant partial effect on the income of fish farmers, while the variables of pond farming experience and pond farmer groups have no partial effect on the income of fish farmers in Pucangtelu Village, Kalitengah District, Lamongan Regency. Simultaneously, it shows that the variables of land area, production costs, pond farming experience, and pond farmer groups have a significant effect on the income of fish farmers in Pucangtelu Village, Kalitengah District, Lamongan Regency.

INTRODUCTION

East Java Province is a province with a sea area that can be managed of 233.37 km². This should be used to support economic development in the fisheries sub-sector. Indicators of economic development are improving community welfare, reducing poverty rates, and economic growth. Fisheries contribute to the national economy and fulfill the basic needs of society. If the population increases, the need for food will increase.

Aquaculture in Lamongan Regency has a land area of 20,487.40 Ha, which includes ponds, rice fields, ponds, floating net cages and imbedded net cages. Pond rice fields are agricultural land for farming that can be used to produce more than one agricultural commodity. This potential must be utilized by all parties to support the community's economy. in 2019 the largest area of pond rice fields was a total of 19,520 Ha with a total fish production of 50,301 tons. The resulting production was not comparable to 2021 with a total land area of 19,503 while the fish production produced

was worth 55,284 tons. This indicates that decreasing land area does not necessarily affect fisheries production. The production factors that exist in the economy will certainly determine the extent to which the country can produce the goods or services needed by society (Maulidah, 2021).

The Lamongan Regency Government continues to encourage increased fish production by assisting in the procurement of seeds, the use of quality and appropriate fertilizers and pesticides. According to Sukirno (2006) Function has a relationship between production factors and the level of production created. Factors that can increase fish production in general, but the obstacles that farmers often face are expensive production costs, limited subsidized fertilizers, and flood disasters that strike every season require farmers to incur additional costs. Conditions like this will affect the level of income received by farmers. Pucangtelu Village is one of the villages in Lamongan Regency with promising pond farming potential and almost the entire village area is a pond area.

The majority of people's income comes from farming and their livelihoods depend on pond products. The commodities produced by Pucangtelu Village farmers are milkfish, bader fish, goldfish, tilapia fish and vaname shrimp. Carrying out pond farming cannot be maximized due to the fact that every year the pond is hit by flood disasters. Bakhsh et al., (2006) states that one way to maximize farmers' income is to increase production capacity and support the efficient use of production factors.

This research focuses on individual fish farmers in managing pond rice fields for one season which in the process includes land area, production costs, pond farming experience and pond farmer groups as independent variables and income as the dependent variable. The author is interested in researching factors that influence income based on the inconsistency of previous research results. These factors include land area, production costs, pond farming experience and pond farming groups. Based on the phenomenon of farmers' income levels in Pucangtelu Village, Kalitengah District, Lamongan Regency and these factors include land area, production costs, pond farming experience and pond farmer groups.

The aim of this research is to find out and analyze whether land area, production costs, pond farming experience and pond farmer groups have a partial and simultaneous effect on the income of fish farmers in Pucangtelu Village, Kalitengah District, Lamongan Regency.

RESEARCH METHODS

This research uses quantitative methods, according to Sugiyono (2019) quantitative data is data that uses numbers which are then measured using statistical tools to test the data. The population in this study refers to the total fish farmers who are the focus of the research. Based on village book data, the total population of fish farmers is 713. Meanwhile, to obtain samples using the Slovin approach with a standard error of 10%, 90 respondents were obtained. The data collection method is carried out using structured interviews, and supported by secondary data which will be collected using documentation techniques, namely utilizing references related to the discussion being studied.

Operational variables are operational variables which are things that are research objects that are determined in a research activity that show variations or can change both quantitatively and qualitatively (Arikunto, 2013). The operational definition of the variables in this research is

1. Free Variable or Independent Variable (X)

a. Land area

The size of the land area greatly influences farming income. The indicator used is the area of land owned by fish farmers using m² measurements.

b. Production cost

Production costs are the total costs incurred by farmers to fund their needs for one season. The indicators used are fixed costs (land tax costs and equipment maintenance), variable

costs (costs of purchasing seeds, feed, fertilizer, pesticides, oilseed materials, labor, harvest costs and wage costs).

c. Pond Farming Experience

Pond farming experience is the length of time the farmer has spent carrying out his farming business, using the indicator of the length of time the farmer has been in farming (years).

d. Pond Farmers Group

The formation of farmer groups will support groups and members of farmer groups in carrying out their respective farming businesses which influence the income conditions of members of the pond farmer group, using indicators of whether they are members or not members of the pond farmer group.

2. Bound Variable or Dependent Variable (Y)

According to Sukirno (2006) Income is the amount of money received by a fish farmer from the harvest during the last harvest period, using indicators of the size of the income received by the farmer.

The analysis technique used is multiple linear regression analysis. Multiple Linear Regression Analysis according to Sugiyono (2019) is an analytical tool used to predict the influence of two or more independent variables on the dependent variable. So the formula for multiple linear regression is as follows:

$$\text{Ln}Y = \beta_0 + \beta_1\text{LnLL} + \beta_1\text{LnBP} + \beta_1\text{LnPB} + \beta_1\text{LnKT} + e$$

The classical assumption test is used to identify potential deviations in the variables used. This test is carried out before multiple linear regression. The classical assumption tests used are the normality test which is used to assess the normality of variables, the multicollinearity test aims to test the existence of correlation between independent variables, and the heteroscedasticity test to determine the inequality of variances of variable residuals. Hypothesis testing consists of partial tests and simultaneous tests. Followed by a coefficient of determination test to find out how much the independent variable has on the dependent variable.

RESULTS

In accordance with research conducted by the author, the following results were obtained:

1) Classical Assumption test analysis

a) Normality Test

The findings of the normality test results show that the Jarque-Bera value is 3.712938 while the probability value is greater than 0.05, namely $0.156223 > 0.05$, so it can be concluded that the model in this study has a normal distribution.

b) Multicollinearity test

The results of the multicollinearity test can show that the Centered VIF value for land area (7.243825), production costs (7.257933), pond farming experience (1.125192), and pond farming group (1.176560) is less than 10. So it can be concluded that this research model does not have a multicollinearity relationship.

c) Heteroscedasticity test

Based on the results of the heteroscedasticity test using the white test, it shows that in this study a chi-square probability value of 0.9560 was greater than 0.05, so it can be concluded that there is no heteroscedasticity problem.

2) Multiple Linear Regression Analysis

The results of simple linear regression analysis using Eviews 12 obtained the equation:

$$\text{Ln}Y = \beta_0 + \beta_1\text{LnLL} + \beta_1\text{LnBP} + \beta_1\text{LnPBT} + \beta_1\text{LnKTT} + e$$

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.462909	0.401318	1.153471	0.2520
LL	0.412762	0.117046	3.526496	0.0007
BP	0.721551	0.109370	6.597353	0.0000
PBT	0.011895	0.032412	0.366997	0.7145
KTT	0.035168	0.025756	1.365450	0.1757
R-squared	0.897835	Mean dependent var	7.420000	
Adjusted R-squared	0.893027	S.D. dependent var	0.275493	
S.E. of regression	0.090105	Akaike info criterion	-1.921735	
Sum squared resid	0.690103	Schwarz criterion	-1.782857	
Log likelihood	91.47809	Hannan-Quinn criter.	-1.865731	
F-statistic	186.7471	Durbin-Watson stat	1.351941	
Prob(F-statistic)	0.000000			

Image: 1. Multiple Linear Regression Test

Source: Analysis data (2024)

The coefficient of the land area variable shows a value of 0.412762, which means that every 1% increase in land area will have an effect on the farmer's income by 0.41%. The coefficient of the production cost variable shows a value of 0.721551, which means that every 1% increase in production costs will have an effect on farmer income by 0.72% each harvest season. The coefficient of the pond farming experience variable shows a value of 0.011895, which means that every 1% increase in pond farming experience will have an effect on the farmer's income by 0.011% each harvest season. The coefficient of the pond farmer group variable shows a value of 0.035168, which means that the pond farmer group has an influence on the income of the pond farmers.

3) Hypothesis Testing

a) Partial Test (t Test)

Based on hypothesis testing, namely the t test, it shows that the results of the analysis of the land area variable have a tcount of 3.526496 at ($\alpha=5$ percent) and ($df=85$), a ttable of 1.662 is obtained because $tcount > ttable$ while the probability value is $0.0007 < 0.05$ then H_0 is rejected and H_a is accepted, this shows that the land area variable has a significant effect on the income of fish farmers. The production cost variable has a tcount of 6.597353 at ($\alpha=5$ percent) and ($df=85$), we get a ttable of 1.662 because $tcount > ttable$ while the probability value is $0.0000 < 0.05$, so H_0 is rejected and H_a is accepted, indicating that Production cost variables have a significant effect on farmer income. The pond farming experience variable has a tcount of 0.366997 at ($\alpha=5$ percent) and ($df=85$), a ttable of 1.662 is obtained because $tcount < ttable$ while the probability value is $0.7145 > 0.05$, so H_0 is accepted and H_a is rejected, this shows that the fish pond farming experience variable is not significant on the farmer's income. The pond farmer group variable has a tcount of 1.365450 at ($\alpha=5$ percent) and ($df=85$), obtained a ttable of 1.662 because $tcount < ttable$ while the probability value is $0.1757 > 0.05$ so H_0 is rejected and H_a is rejected, so It was found that the pond farmer group variable was not significant to the farmer's income.

b) Simultaneous test (f test)

Based on multiple linear regression, it shows that the f test results obtained an F-statistical probability value of $0.000000 < \alpha = 0.05$ (5 percent). Apart from that, Fcount from the results of multiple linear regression is 186.7471 and Ftable is 2.48 using a confidence level of 5 percent and degrees of freedom in the numerator ($df_1=4$) and degrees of freedom in the denominator ($df_2=35$). So it can be seen that the value of fcount is greater than ftable. Thus, H_0 is rejected and H_a is accepted, it can be concluded that the independent variables, namely land area, production costs, pond farming experience, and pond farmer group, all have a

significant effect on the income of fish farmers.

c) Coefficient of Determination (R²)

shows that the results of R-squared (R²) are 0.897835 means that the independent variables land area, production costs, pond farming experience and pond farmer groups influence the income of fish farmers

DISCUSSION

The influence of land area on farmer income

The land area variable has a significant effect on income. This is because farmers have optimized land utilization, optimal use of fertilizer and sustainable fish maintenance from the start of seed sowing until the harvest process takes place. Apart from that, the area of land planted will affect the number of fish seeds stocked, because the size of the land owned by the farmer will affect the amount of production produced and have an impact on the income received by the farmer. This finding is in accordance with what was stated Daini et al., (2020) states that land area is the entire area where seed rearing is carried out, land area guarantees the amount or results that farmers will obtain. In previous research Novianty & Awaliyah (2022) who obtained the results that the land area variable had a significant effect on the income of watermelon farmers in Cikadu Village, Cikalong District, Tasikmalaya Regency. Also explained in previous research Andrias et al (2017) who obtained the results that the land area variable had a significant effect on rice business income in Jelat Village, Baregbeg District, Ciamis Regency. Then research is carried out Maryoni (2015) stated that the results of the land area variable had a significant effect on the income of farmers in Kepuasan Raya Village. Meanwhile, the research carried out Nugraha & Alamsyah (2019) who obtained the results that the land area variable was not significant on the income of rubber farmers in Sako Suban Village, Batang Hari Leko District, South Sumatra.

The influence of production costs on farmer income

The production cost variable has a significant effect on income. This is because farmers are efficient in calculating how much production costs they incur and how much income they generate. Apart from that, the production costs incurred by farmers in caring for fish are in accordance with the rules for managing pond farming, such as providing appropriate fertilizer and pesticide dosages, and purchasing fish seeds of good quality. This is supported by research conducted which showed that the production cost variable had a significant effect on the income of shrimp farming in Teluk Pambang, Bantan District. Then on to research Dewi Lestari & Winahyu (2021) which obtained the results that the production cost variable had a significant effect on shallot farming income in Bojonegoro Regency. Instead the research was conducted Rahmawati & Priantilianingtiasari (2023) obtained the results that the production cost variable was not significant to the income of laying hen breeders in Blitar

The influence of pond farming experience on farmer income

The pond farming experience variable is not significant on income. This is because farmers only use their pond farming experience to grow seeds, while they are not yet able to face the obstacles that occur in their pond farming. So fish farmers need to increase their information about better management of pond farming by following the extensions held by pond farmer groups or related agencies, so that they can overcome obstacles such as controlling pests and diseases in corn plants effectively so that they get optimal results and can increase income. This is supported by research conducted Hana et al., (2023) stated that the results of the farming experience variable were not significant on corn farming income in Prai Hambuli Village, Nggaha Ori Angu District, East Sumba Regency. In research Naim et al., (2015) which obtained the results that the farming experience variable was not significant on sugar cane farming income in Tayu District, Sinjai Regency. Instead the research was conducted Wahyuni et al., (2022) obtained the results that the

farming experience variable had a significant effect on the income of rice farming in Pajalesang Village, Lilirilau District, Soppeng Regency.

The influence of pond farmer groups on farmer income

The pond farming group variable is not significant on income. This is because pond farmer groups cannot be a place for farmers to gain knowledge and information regarding pond farming management to increase income through counseling, provide subsidized fertilizer and seeds for farmer group members, and cannot provide agricultural technology facilities from the government for farmer group members. pond like a tractor. This is supported by research conducted by Mutmainnah, Levis, (2021) which obtained the results that the farming experience variable was not significant on the income of lowland rice farmers in Tuatuka Village, East Kupang District, Kupang Regency. But it is inversely proportional to research Kiki et al., (2022) who obtained the results that the farming experience variable had a significant effect on the income of lowland rice farmers in the technical irrigation area of Kampera District, East Sumba Regency. Research conducted Anggara et al., (2022) also obtained results that the farming experience variable had a significant effect on the income of lowland rice farming in Martasari Village, Parigi District, Parigi Mautong Regency.

The Influence of Land Area, Production Costs, Pond Farming Experience and Pond Farmer Groups on Farmers' Income

Based on the hypothesis testing that has been carried out, it can be seen that the four variables are significant. The variables of land area, production costs, pond farming experience and pond farmer groups together have a significant influence on corn farmers' income, while the farming experience variable does not have a significant influence on corn farmers' income. This research is also in line with research conducted by Novita Sari (2018) regarding the influence of production, land area and production costs on the income of rubber farmers in Betung District, Banyuasin Regency, stating that land area and production costs have a significant effect on the income of rubber farmers in Betung District, Banyuasin Regency.

CONCLUSION

This research aims to determine the income of pond farmers in one harvest season in Pucangtelu Village, Kalitengah District, Lamongan Regency. The results of this research show that the variables of land area and production costs have a positive and significant partial effect on the income of fish farmers, while the variables of pond farming experience and pond farmer groups have no partial effect on the income of fish farmers in Pucangtelu Village, Kalitengah District, Lamongan Regency. Simultaneously, it shows that the variables of land area, production costs, pond farming experience, and pond farmer groups have a significant effect on the income of fish farmers in Pucangtelu Village, Kalitengah District, Lamongan Regency.

SUGGESTION

- 1 Fish farmers need to further increase pond productivity by optimizing the pond land they own, so that there is no change in function and it is hoped that the farmer's income will increase. The land area owned by fish farmers in Pucangtelu Village is generally large, but there are still some fish farmers whose land area is relatively small, which results in less than optimal income.
- 2 Fish farmers need to optimize their production costs as efficiently as possible so that by allocating the right costs they can obtain maximum and quality results. What farmers can do is minimize costs such as fertilizer costs, pesticides, seeds, labor costs and harvest costs to increase the income they receive.

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