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Factors that affect the Amaount of Catfish Farming Production in the Catfish Village Boyolali Regency

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Abstract

The purpose of this study is to examine the influence of capital, land area, and labor on catfish farming production in Catfish Village, Palm Oil District, Boyolali Regency. Primary data was collected from 29 respondents over a period of one harvest quarter. The study results indicate that capital has a significant impact on catfish farming production, while land area and labor do not have a significant effect. These findings have important implications for catfish farmers and policy makers. It emphasizes the need for sufficient capital investment to enhance production capabilities. Policy makers can support farmers through financial programs and credit access to facilitate investment in modern technologies and infrastructure. It is important to note that this study focuses on the specific context of Catfish Village in Boyolali Regency. Further research is needed to validate these results and explore additional factors that may influence catfish farming production.

1. INTRODUCTION

Walden & McGuire (2011) argue that the sea area is a common property and fishermen have the same rights to exploit resources and engage in fishing. Since fish stocks are a renewable raw material, the question often arises of how much fish can be used without negative consequences in the future. Sustainability is the key to fisheries development and careful management, so that it is hoped that it can improve stock conditions and can improve the welfare of the fishermen themselves. (Damayanti, 2016) .

Fishery is an agricultural sub-sector and is a source of the Indonesian people's economy. Fish has various benefits for human life because it contains vitamins and protein. Most Indonesian people consume it for their daily food. Apart from being consumed by fish, it can also be used for important research, such as oil produced by fish as a source of vitamins (Rewanda et al., 2021) .

Minapolitan development is an integrated development of regional development and agribusiness. The Minapolitan Area Development Approach is a Long-term multi-stakeholder Development Approach. The aim is that the Minapolitan Area can increase the level of income and the welfare of the community by accelerating the development of the area, so that it can encourage the development of the fishing area. Technically the area is the Minapoli region, where most of the population derives income from catfish farming activities, and all activities in the area are dominated by enlargement, fish processing and silkworm activities. One of the Minapolitan Areas in Central Java is in Boyolali Regency which has been designated as a Minapolitan Area through the Minister of Maritime Affairs and Fisheries Decree KEP.32/MEN/2010. Boyolali Regency has vast land potential and abundant water resources, as well as access to capital, market access, toll roads, ports and airports that can be reached, so that the large number of workers will have enormous potential in the catfish farming sub-sector . In places like Tegalrejo Village in Boyolali District, most of the people are engaged in fish farming, namely catfish farming. Apart from producing milk and beef, Boyolali is also a producer and supplier of catfish. Catfish cultivated in Boyolali Regency have high economic value due to high added value due to product diversification. Catfish can be processed into various kinds of food such as catfish nuggets, catfish chips and

catfish floss. With product legalization, it not only creates added value and can increase productivity. Apart from that, it also has a broader impact on the Indonesian economy and the absorption of the workforce (Directorate General of Aquaculture, 2022) .

Boyolali Regency has a catfish farming center in the village of Tegalrejo. Administratively, Tegalrejo Village consists of several hamlets/villages, namely Jetak, Mutih, Jetis, Mojokulon, Mojowetan, Tegalrejo, Ngoro-oro and Gregunung. The only settlement that has the potential to cultivate fish is Mangkubumen. Seven other settlements are potential agricultural areas. Respondents interviewed for this survey were catfish farmers in Tegalrejo Village, with a total of 29 respondents.

Based on Table 1, it can be seen that the capital issued by the owner of a catfish farming company in Tegalrejo village is IDR 16,120,000 for the largest and IDR 11,896,000 for the smallest. And the widest area used for catfish breeding is 81 square meters and the smallest is 48 square meters. The maximum number of workers used for catfish breeding is 1, at least 0. Then from Table 1 it can be seen that the maximum production of catfish farming is 1000 kg and a minimum of 650 kg.

Catfish farming activities carried out by the city government aim to achieve high productivity and the maximum expected profit. However, the productivity of catfish farming is still not optimal. The problem faced by cultivators in the catfish business is that there are still many cultivators who have not used the recommended cultivation techniques. Other obstacles in Boyolali Regency are the high price of pelleted feed, limited farmer funds, and the absence of a seed supplier.

Observations of catfish farming practices in the field show that the level of production between individual cultivators is still very different. This is the input factor of farmer production that affects the level of operational efficiency. So it is necessary to have research that aims to analyze the influence of production factors on the level of total production of catfish farming in Boyolali Regency. The results of this study are expected to be useful for entrepreneurs, especially catfish cultivators, and the government, especially regarding policy decisions on the development of freshwater fish farming to increase people's income.

2. LITERATURE REVIEW

2.1 Catfish Cultivation

The Greater Sunda Islands and Lesser Sunda Islands are naturally home to catfish in Indonesia. The name "catfish" is used differently in different countries. Keli (Malaysia), plamond (Thailand), ca tretrang (Japan), mali (Africa), gura Magura (Sri Lanka), and catfish (UK) are all names for catfish. Catfish are known as catfish or rivets in Makassar/Sulawesi, catfish in Java, ipintet fish in Kalimantan, or coral reef fish in Sumatra in various parts of Indonesia. Meanwhile, the name catfish is used in international trade. This fish is known as catfish because it resembles a cat's whiskers. Actually the term "catfish" does not only refer to catfish but also to other fish with whiskers, such as baun and catfish (Mahyuddin, 2011) . People have known catfish for a long time, but the market for catfish has been declining in recent years. The decline in the market for catfish products can be attributed to several factors, including: First, catfish habitat has decreased. Freshwater habitats for catfish include rivers, swamps, rice fields and lakes. Compared to 20-30 years ago, this location is significantly reduced now it is shrinking due to being used by humans or contaminated with hazardous waste so that more and more local catfish are abandoned. Second, the community cannot benefit from the slow growth of local catfish reproduce on their own without human intervention, they are actually very easy to grow. Although local catfish are more flavorful than African catfish, they are not a mainstay of freshwater fish farming like other local fish. African catfish is another breed that is now very popular. According to Nuha (2017) , this is a type of imported catfish imported with the aim of

doing so from other countries, especially Africa.

2.2 Production Theory

Sukirno (2011) said that the production factors used during the production process are closely related to the final product. According to Habib (2013) , production theory describes the relationship between the factors of production and the level of production produced. The production function and the level of production produced can be used to state the theory of production. The amount of production is called output, and the factors of production are called inputs. Murdiantoro (Setyaningsih & Padang, 2018) states that business activities require the use of four factors of production: capital, land, labor, and expertise. Land, capital, and labor are the only three factors of production that experts cite in some literature. Each serves a different purpose and interacts with the others. Agricultural or production processes will fail if one or more of the three factors land, capital, and labor are not available.

2.3 Capital

Humans produce capital, which is used to acquire essential goods and services. Investment, which refers to a group of funds used for income-generating activities, is another name for capital. According to Fisher (2010) , investment is expenditure made with the intention of increasing goods and maintaining stocks of capital goods. Capital goods include machinery, offices and other durable goods used in the revenue process. The term "capital" can also refer to expenditures made by businesses or investors to acquire capital goods and equipment of income in order to increase the capacity of the economy to produce goods and services. The economy is able to produce more goods and services in the future due to the increase in the number of these capital goods (Mulyadi, 2007) . Capital is one of the factors that affect the results of income. Using effective revenue tools can improve revenue outcomes. Own capital and borrowed capital, both of which directly contribute to income, do not differ in the process of earning. When some of the income is saved and reinvested with the intention of increasing output and income in the future, capital accumulation occurs.

Todaro & Smith (2015) find that the purchase of new factories, machinery, equipment, and raw materials increases the physical stock of capital that is, the real value of all physical productive capital goods that clearly allows for increased output in the future. Setiawan & Oktarina (2017) used OLS (*Ordinary Least Square)* multiple regression analysis to find that labor did not affect the production of catfish farming while seeds, feed, and lime did. East Oku District.

2.4 Labor

BPS (2021) defines the workforce as residents aged over 15 years who work, who work but do not work temporarily, or who are looking for work. self-employed, seek help from temporary workers, family, and freelancers . According to Purwaningsih, (2017) , labor is one of the main inputs in business. Human, livestock, and mechanical or machine labor are the three types of labor. Whether within the family or outside, labor can be obtained. Male workers, female workers, and child workers. Under the age of 14, children are not allowed to work.

Research conducted by Fadjriati et al., (2018) found that red tilapia production in Klaten Regency was not affected by pond size, while the use of seeds, feed, and labor had a significant effect.

2.5 Pool Area

Land has the potential to be developed as a natural resource. Land is needed in almost every development sector, including agriculture, industry, mining, and others, apart from being a place to live and work (Ritohardoyo, 2013) . Because the fish seeds that are put into the pond depend on the size of the cultivator's pond, Siska (2016) claiming cultivators make more money with wider ponds. Fish seeds are added to the pond in

large quantities if the area of the pond is large, whereas if the pond is small, only a few fish seeds are added.

Sudarmadji et al., (2011) used multiple regression analysis to find out that catfish production in Sumenep Regency was influenced by pond area, labor, feed, medicines, and experience.

3. RESEARCH METHODS

This research was conducted in the Minapolitan area of Lele Village, Tegalrejo Village, Sawit District, Boyolali Regency, which is the largest catfish production area in the Soloraya area. The researcher used a qualitative method, using primary data, which totaled 29 respondents in one harvest/quarter. With the econometric model as follows:

$$JP_t = \beta_0 + \beta_1 MODAL_t + \beta_2 LL_t + \beta_3 JTK_t + \varepsilon_t$$

Where :

JP_t	= Total production of fish farming
β_0	= Constant
$\beta_1, \beta_2, \beta_3$	= Variable regression coefficient
$Capital_t$	= Capital
LL_t	= Land area
JTK_t	= Labor
e	= Error term (Disturbing variable)

4. RESULTS AND DISCUSSION

4.1 Research result

a. Multicollinearity Test

The multicollinearity test is used to determine whether the independent variables in the regression model have a linear relationship or not. The model experiences multicollinearity if the VIF value is greater than 10. The model does not have a multicollinearity problem if the VIF value is less than 10. Table 1.2 displays the results of the multicollinearity test. When all the variables in the model have a VIF value of less than 10, there is no multicollinearity problem.

Table 1.2
Econometric Model Estimation Results

$\widehat{Log(JP)}_i = -14{,}9384 + 1{,}2989\ Log(MODAL)_i +$ (0.0000) *
$0{,}0683\ Log(LL)_i - 0{,}0156\ JTK_i$ (0.1126) (0.2385)
R^2 =0.9505; *DW-Stat* . = 1.2441 ; *F-Stat* . = 160.1258
Prob. F-Stat . = 0.0000
Diagnostic Test
(1) Multicollinearity (VIF) *Log(CAPITAL)*= 1.2132 ;*Log(LL)* =1.3459;JTK=1.2206
(2) Residual Normality (Jarque Bera) *JB(2)* =1.1609; Prob. *JB(2)* = 0.5596
(3) Autocorrelation (Breusch Godfrey) x^2 *(2)* = 4.2628; *Prob.* x^2 *(2)* = 0.1187
(4) Heteroscedasticity (White) x^2 *(4)* = 7.1324; *Prob.* x^2 *(4)* = 0.1291
(5) Linearity (Ramsey Reset) F(1, 24) = 0.7517; Prob. F(1, 24) = 0.3945

Source: *Eviews data processing 9* .

Description : *Significant at α= 0.01; **Significant at α= 0.05; *** Significant at α= 0.10. The number in brackets is the empirical probability *(p value)* of the t-statistic

b. Heteroscedasticity Test

White's test will be used for the heteroscedasticity test. H_0 White test indicates that the estimated model has no heteroscedasticity problem; In addition, the estimated model presents a heteroscedasticity problem for H_A. Based on Table 1.2, the p value (p value), probability, or empirical statistical significance of White's test appears to be 0.1291 (> 0.10), so that H0 is accepted . However, if the p-value (p-value), probability, or empirical statistical significance of White's test is less than H_0, then H_0 is rejected. The model comes to the conclusion that there is no problem with heteroscedasticity.

c. Autocorrelation Test

The Breusch Godfrey (BG) test will be used to measure autocorrelation. H_0 BG test shows that the estimated model does not have autocorrelation problems; The estimated model includes an autocorrelation for H_A. If the p-value (p-value), probability, or empirical statistical significance of the BG test is greater than H_0, then H_0 is accepted. Conversely, if the

p value (p value), probability, or empirical statistical significance of the BG test appears to be 0.1187 greater than 0.10, then H0 is rejected . The estimation model concludes that there is no autocorrelation.

d. Residual Normality Test

The Jarque Bera test (JB) will be used to determine the estimated residual normality of the model. The residual distribution of normal estimation of the model is represented by H_0 in the JB test; The distribution of estimated residual models has an abnormally high HA. If the p-value (p-value), probability, or statistical significance of JB is greater than H_0, then H_0 is accepted. Conversely, if the p value (p value), probability, or empirical significance of JB from Table 1.2 appears to be 0.5596 greater than 0.10, then H0 is rejected . In conclusion, the residual distribution of the model is normal.

e. Model Specification Test

The linearity of the model in this review will be tested using the Ramsey Reset test. The Ramsey Reset test has an H_0 model determinant that scores accurately or directly; whereas the details of the HA model are imprecise or inaccurate. H0 is recognized when f stat Ramsey Reset > alpha. From Table 1.2 the possible observational meaning of the Ramsey Reset F test measurement is 0.3945 (> 0.10) so that H_0 is recognized. Overall, the determination of the model is considered appropriate.

f. Model Existence Test

Model Existence Test The estimated model exists if all independent variables affect the dependent variable simultaneously (the estimated model regression coefficient is not simultaneously zero). The F test is used to determine whether there is an estimated model. the hypothesis is formulated as follows: H_0 : (either the estimated model does not exist or the simultaneous regression coefficient is zero); HA : The estimated model or regression coefficient does not coincide with zero. HA : The estimated model or regression coefficient does not coincide with zero . If the p-value (p-value), probability, or empirical statistical significance F >, H_0 will be accepted; If a p-value (p-value), probability, or empirical statistical significance of F is found, H_0 will be rejected. The p value (p value), probability, or empirical significance of the F statistic is 0.0000 (0.01), so H0 is rejected, as shown in Table 1.2. In conclusion, there are models.

g. Interpretation of the Coefficient of Determination (R^2)

The predictability of the estimated model is shown by the coefficient of determination (R^2). The estimated model has an R2 value of 0.9505, as shown in Table 1.2. This shows that the variables of capital, pond area and labor contribute 95 percent of the variation in catfish production variables. The remaining 5 percent is influenced by non-mode specific variables or factors.

h. Validity test

Test the Significance of the Effect of Independent Variables: Test the Validity of Influence The validity test of the effect tests the significance of the effect of the independent variables, either in whole or in part. Use the t test to determine the validity of the effect. The i-independent variable in the estimated model has no significant effect, according to the t H_0 test ; HA : The i-independent variable of the estimated model has a significant effect . If the p value, probability, or empirical statistical significance t is greater than; H0 will be accepted. If the value of pp(value), probability, or empirical t is statistically significant, H_0 will be rejected. Table 1.3 displays the findings of the effect validity test.

Table 1.3
Influence Validity Test Results

Var	Sig. t	Criteria	Conclusion
logCapital	0.0000	≤0.01	Significant influence
LL	0.1126	>0.10	No effect
JTK	0.2385	>0.10	No effect

Source: Eviews 9 data processing

4.2 Research Discussion

Capital has a significant effect on Total Fish Production (JP) Boyolali, according to the results of the effect validity test (t test) on the econometric model. This can indicate that the findings of this study are in accordance with the initial hypothesis and the Munandar & Sari hypothesis (2019) tracing the factors that influence the amount of fish farming production in Batuphat Barat Village, Muara Satu District, Lhokseumawe City. This shows that the total production of fish ponds in West Batuphat Village, Muara Satu District, Lhokseumawe City is significantly influenced by capital. Test the validity of the effect of the econometric model (t test) reveals that land area has no significant effect on Total Fish Production (JP) Boyolali.

Things like the research of Sinambela et al., (2022) which was conducted on Factors Influencing Tilapia Business Income in Dolo Barat District, Sigi Regency, Central Sulawesi Province. This study shows that land area has no significant effect on tilapia business income in Dolo District, West Sigi Regency, Central Sulawesi Province.

The effect validity test (t test) on the econometric model shows that the amount of fish production (JP) in Boyolali is not affected by the number of workers. Similar findings can be found in the research "Factors Influencing Milkfish Pond Farmers in Salakoe Village, Malangke District, North Luwu Regency" by Saipal et al., (2019) which found that the variable "Number of Labor" has no significant effect on farmer income ponds. Salakoe is in Malangke District, North Luwu Regency.

5. CLOSING

5.1 Conclusion

Some conclusions that can be drawn from the results of the discussion include that the variable capital influences the factors that influence the amount of production of catfish farming while the variable labor and land area have no effect. There are many factors that can affect the amount of production, not just capital, land area, and labor, and the limitations of this study include additional variables at least the variables used. It is better to add additional variables to be studied.

5.2 Suggestion

From interviews with the regional cultivators, in fact the cultivators have already implemented the use of technology such as automatic feeding equipment. However, after the passage of time the results have decreased in the amount of production due to a mismatch between the range of feed distribution from the automatic feeder with the pond area and the income of the cultivator has decreased due to additional expenses for electricity costs. Based on these limitations, the researcher hopes that further research will be added using other variables so that they include more factors that affect the amount of production.

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