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ANALYSIS OF FACTORS INFLUENCING MILKFISH (Chanos -chanos) TAMB PRODUCTION IN LANGSA CITY, ACEH PROVINCE

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Abstract

This research aims to determine the factors that influence milkfish pond production and determine the production model/strategy of milkfish pond businesses in Cinta Raja Village, East Langsa District, Alue Dua Village, Langsa Baro District, and Seuriget Village, West Langsa District, Langsa City . This research was conducted from December 2023 – February 2024. This research is quantitative descriptive research. Primary data was collected through two types of collection techniques, in the form of observation and interviews by filling in questionnaires. Meanwhile, secondary data in this research was obtained by downloading data from the websites of the relevant agencies and the central statistical agency, as well as from previous research. The sampling technique uses a multistage random sampling technique. In this research, what is thought to influence the production income of traditionally cultivated milkfish ponds is land area, experience, seeds, fertilizer, feed, labor and capital. The results of the research show that the factors that have a real influence on the production of traditional milkfish farming businesses in Langsa City include: land area and seeds, fertilizer, feed and capital. Land area and capital have a negative effect on income, while seeds, fertilizer and feed have a positive effect on income.

Keywords : ***ponds, production, income,***

1. INTRODUCTION

Development in Aceh that can have a positive impact on the development of the fisheries sector is fish ponds. Aceh Province is one of the milkfish producing provinces in Indonesia. Milkfish cultivation areas in Aceh province include Simelue Regency, Aceh Besar Regency, Aceh Jaya Regency, Southwest Aceh Regency, Nagan Raya Regency, Banda Aceh City, Sabang City, Pidie Regency, Pidie Jaya Regency, Biruen Regency, Lhokseumawe City, North Aceh Regency , East Aceh Regency, Langsa City, and Aceh Tamiang Regency (Aceh Province in Figures, 2023). Langsa City has an area of 239.83 km2 or 239,830 ha and has 16 km of coastline directly facing the Malacca Strait and has large river channels stretching across parts of Langsa City. Supported by land cover data for Langsa City ponds covering an area of 4,676.26 ha (Agrosamudra, 2022). Langsa City has great potential to develop and increase the production of its fish farming business. This potential is also supported by the geographical location of Langsa City which has potential areas for fish pond production. From the discussion above, it proves that the ranking of Langsa City's pond production is still below that of other districts/cities in Aceh Province, the natural potential is supportive, there are a lot of human resources, and there are no taxes for pond entrepreneurs. Why can't the production of this pond business be increased? This became the basis for researchers to conduct research on several pond business production managers regarding the factors that influence the production of milkfish pond businesses. Next, several potential and feasible places are determined represents the diversity of production models/strategies for this milkfish farming business. The pond areas that have the potential to be developed are Cinta Raja Village, Alue Dua Village and Seuriget Village.

2. IMPLEMENTATION METHOD

Place and time of research

The location of the research was carried out in 3 villages, namely Cinta Raja, Alue Dua and Seuriget Villages in East Langsa District, West Langsa District and Langsa Baro District, Aceh Province.

Types of research

The type of research used is quantitative descriptive.

Data Collection Methods and sampling

The data collected consists of primary data and secondary data. Primary data was obtained from direct interviews with respondents through a previously prepared questionnaire, while secondary data was obtained from notes or documentation in the field.

Sampling Method

The sampling method in this research uses a multistage random sampling technique which is a combination strategy sampling. So that the number of samples in each village has the same average number of samples, Cinta Raja Village has 20 samples, Alue Dua Village has 12 samples and Seuriget Village has 18 samples.

Validity of measuring instruments

The validity test is processed using the SPSS application on the basis of decision making:

1. If rcount > rtable the question is said to be valid
2. If rcount < rtable the question is said to be invalid

Data analysis

Analysis of factors that influence the production of milkfish pond businesses in Cinta Raja Village, Alue Dua Village and Seuriget Village, Langsa City, Aceh Province. Using quantitative descriptive analysis and linear regression analysis method. Several analytical tools used in this research are presented as follows:

1. **Acceptance**

   TR = QP

Where:

TR = Total Revenue or TotalRevenue (Rp)
Q = Number of products produced by the cultivation business (Kg)
P = Product selling price (Rp)

2. **Total Cost**

   TC= C+VC

Where :

TC = Total Cost or Total Cost (Rp)
FC = Fixed Cost or Fixed Cost (Rp)
VC = Variables Cost or CostVariable

3. **Total Income**

   π= TR-TC

Where:

π = Total income (Rp)
TR = Total Revenue or Total Revenue (Rp)
TC = Total Cost or Total Cost (Rp)

4. **Multiple linear regression analysis test**

In this research, quantitative data was analyzed using linear regression analysis. Linear regression analysis is used with the aim of making predictions on the dependent or dependent variable. Due If the variable used is more than 1, then Multiple Linear Regression Analysis is used.

5. Coefficient of Determination

Coefficient of determination(R) is a test to measure how much ability the independent or independent variable has in explaining variations in the dependent or dependent variable. The coefficient of determination can be found by
using the R Square (R) value.
The range of coefficient of determination values is between 0 to 1 or 0 ≤
R ≤ 1. The value of R Square (R) is increasing approach number 1 defines that the independent variable is getting stronger in predicting or explaining the dependent variable (Mahendra, 2015). The coefficient of determination value can also be expressed in percentage form (%), which is interpreted as the contribution of the independent variable to the dependent variable.

6. Simultaneous Significance Test

The F test or simultaneous significance test functions to test whether the independent variables contained in a regression model simultaneously or together can explain the dependent variable or have an effect on the dependent variable (Setiawatietal., 2018). This research uses the F test with a significance value of 5% or α=0.05. The F test hypothesis or simultaneous significance test is as follows:

a. H0: Independent variables simultaneously Noeffect on the dependent variable.
b. H1: The independent variable simultaneously influences the dependent variable.

As for The decision to accept or reject H0 in the F test is as follows:

a. If the Significance value or pvalue
   ≥0.05 then H0 is accepted.
b. If the Significance value or pvalue
   ≤ 0.05 then H0 is rejected.

7. Partial Significance Test

The T test or partial significance test functions to test whether the independent variables contained in a regression model partially or individually can explain the dependent variable. This research uses the T test with a significance value of 5% or α = 0.05. The T test hypothesis or partial significance test is as follows:

a. H0: The independent variable partially has no effect on the dependent variable.
b. H1: Partially independent variable influentialtowards the dependent variable

The decision to accept or reject H0 in this T test is as follows:

a. If the Significance value or pvalue
   ≥ 0.05 then H0 is accepted
b. If the Significance value or pvalue
   ≤ 0.05 then H0 is rejected

DESCRIPTION REGION ANDRESPONDENT CHARACTERISTICS

Langsa City has an area of 239.83 km2. Of the five sub-districts in Langsa City, three sub-districts are located in coastal areas, namely: West Langsa District, East Langsa District and Langsa Baro District. Low, undulating plains and rivers are the characteristics of Langsa City, with average annual rainfall ranging from 1,850 – 4,013 mm, where the air temperature ranges between 28°C – 33°C and is at an altitude of between 0– 29 m above sea level, the average relative humidity of Langsa City is 75% (BPS Langsa City, 2023). Topographically, Langsa City is located on a coastal alluvial plain with an elevation of around 8 m above sea level. In the southwest and south, it is bordered by moderately undulating folded mountains, with an elevation of around 75 m, while in the east, it is swamp deposits with a fairly wide distribution. (BPS Langsa City, 2023). The results of the 2021 Population Census show that the population in Langsa City is 188,878 people, consisting of 94,886 men and 93,992 women and a sex ratio of 101%. Population density in Langsa City in 2021 will reach 788 people/km2. Referring to the mandate of the 1945 Constitution and its amendments (article 31 paragraph 2), through education the government consistently seeks to

improve the human resources of the Indonesian population. The 6-year and 9-year compulsory education programs, the National Foster Parents Movement, and various other supporting programs are part of the government's efforts to accelerate improving the quality of human resources, which will ultimately create strong human resources, ready to compete in the era of globalization.

In the 2022/2023 academic year, the number of elementary schools/equivalents will be 79 schools with a total of 19,531 students. At junior high school level there are 32 schools with as many students 10,168 students. At high school level there are 27 schools with a total of 9,257 students. One indicator of increasing welfare besides the level of education is the level of public health. Development in the health sector is an important part of improving human resources as reflected in the Sustainable Development Goals (SDGs) program. In 2021 the number of health facilities in Langsa City will be 4 hospitals, 5 Community Health Centers, 119 Posyandu and 54 Polindes. Judging from the data from the March 2023 survey, the percentage of poverty rate for Langsa City residents decreased by 0.34 points and in other words there has been an increase of IDR. 469,348/capita/month. According to this data, there are still 19,410 residents of Langsa City who are classified as poor. The natural potential of Langsa City makes it very possible for fish farming production. The total area of ponds that have been utilized currently is 2,107.91 ha. The number of traditional fish pond farmers spread across the Langsa City area is 881 fish farmers. With total pond production of 585.19 tons. The characteristics of the respondents are a component that we also need to observe, because there could be certain characteristics that differentiate the business other cultivation businesses. In discussing the characteristics of these respondents, we can conclude as in the table below:

Table 1.Conclusion Characteristics Respondent

No	R count	R table	Information
1	0.774	0.284	Valid
2	0.631	0.284	Valid
3	0.824	0.284	Valid
4	0.824	0.284	Valid
5	0.675	0.284	Valid
6	0.372	0.284	Valid
7	0.824	0.284	Valid

Other Jobs Other jobs on the side 24 people Other jobs as principally 16 people

3. RESULTS AND DISCUSSION

Fish pond production is one of the businesses that is starting to become popular among new investors who have sufficient capital to carry out this business. Researchers conducted surveys and interviews using questionnaires with 50 respondents whose entire way of producing their fish farming business was still the traditional method. Researchers try to analyze the factors that influence the production of milkfish pond businesses in Langsa City, Aceh Province.

The questionnaire used has been tested for validity and the results are as follows:

Table 2. Validity of the questionnaire

VARIABLES	CHARACTERISTICS MAJORITY
Gender	Man
Age	41 years – 50 years
Religion	Islam
Address	District West Langsa
Education	SENIOR HIGH SCHOOL
Marital status	Marry
Number of husbands/wives	1 (one) wife
Number of children	More from 3 (three) child

In this case the researcher made a research sample of 50 respondents (farmers). The sample of respondents was interviewed and filled out a questionnaire.

Acceptance Analysis

Table 3.Total Revenue from Milkfish Farm Cultivation Business from a sample of 50 respondents

Descriptive Statistics

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
NUMBER OF PRODUCTION	50	2975	19500	417778	8355.56	3806.226
SELLING PRICE	50	20000	20000	1000000	20000.00	,000
ACCEPTANCE 1	50	59500000	390000000	8355375000	167107500.00	76125182.260
ACCEPTANCE 2	50	500000	12000000	112500000	2250000.00	1941096.892
TOTAL RECEIPTS	50	62500000	402000000	8467875000	169357500.00	76857449.920
Valid N (listwise)	50					

1. Total Cost Analysis

Table 4.Total Cost of Milkfish Farm Cultivation Business from a sample of 50 respondents

Descriptive Statistics

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
FIXED COST	50	2000000	27000000	523750000	10475000.00	4931657.936
VARIABLE COST	50	35112000	233850000	4815894875	96317897.50	43567215.160
TOTAL COST	50	37112000	256050000	5339644875	106792897.50	47645353.160
Valid N (listwise)	50					

2. Income Analysis

Table 5.Total Milkfish Farm Cultivation Income from a sample of 50 respondents

Descriptive Statistics

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
TOTAL RECEIPTS	50	62500000	402000000	8467875000	169357500.00	76857449.920
TOTAL COST	50	37112000	256050000	5339644875	106792897.50	47645353.160
TOTAL INCOME	50	20934500	142715375	3021230125	60424602.50	29047371.680
Valid N (listwise)	50					

3. Multiple Linear Regression Analysis

Multiple linear regression analysis is an investigation where it is intended to prove whether or not there is an influence between several independent variables on the dependent variable.

Table 6.Total Milk fish Farm Cultivation Income from a sample of 50 respondents

Coefficientsa

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,209	,276		,757	,453
	LAND AREA	-.672	,179	-.630	-3,761	,001
	EXPERIENCE	-.004	,052	-.005	-.078	,938
	SEEDLING	1,185	,180	1,151	6,593	,000
	FERTILIZER	,472	,158	,444	2,996	,005
	FEED	,427	,147	,365	2,914	,006
	WORK POWER	-.060	,054	-.067	-1.105	,276
	CAPITAL	-.429	,209	-.408	-2,052	,046

a.Dependent Variable: INCOME

$$Y = 0.209 + (-0.672)1 + (-0.004)X2 + 1.185X3 + 0.472X4 + 0.472X5 + (-0.060)6 + (-0.429)7$$

The constant is 0.209, this is shows that if X1,X5, X6 and X7 have a value of 0 then the value Y remains at 0.209. Based on multiple linear regression analysis, it is proven that there is an influence between several independent variables on the dependent variable. Some of the influences obtained are positive and some are negative. Those that have a positive effect are Seeds (X3), Fertilizer (X4), Feed (X5), while those that The negative influence is land area (X1), experience (X2), labor (X6), and capital (X7). Capital (X7), and the remaining 13.5% is explained by other variables outside the regression model.

Table 7.Results Analysis CoefficientDetermination (R Test)

Variable (X)	R Square	Percent
Land area (X1) Experience (X2) Seeds (X3) Fertilizer (X4) Feed (X5) Labor (X6) Capital (X7)	0.865	86.5 %

4. Determination Coefficient Analysis (R Test)

Based on the R test, it is known that the coefficient of determination (R-Sq) is 0.865, indicating that 86.5% of the diversity of milkfish production can be explained by the variables Land area (X1), Experience (X2), Seeds (X3), Fertilizer (X4), Feed (X5), Labor (X6), and

5. Simultaneous Significance Analysis (F Test)

Based on the F test, the estimation results of the traditional milkfish production model show that the P-value is equal to

0,000. The P-value is smaller than the real level of 0.05, this value shows that the diversity of milkfish production can be explained significantly by the diversity of variables Land area (X1), Experience (X2), Seeds (X3), Fertilizer (X4), Feed (X5), Labor (X6), and Capital (X7).

Table 8.Simultaneous Significance Analysis Results (F Test)

Hypothesis	Variable (X)	F_{count}	F <>	F_{table}	sig	Sig <>	sig	H0	Ha
H8	Land area (X1) Experience (X2) Seedlings (X3) Fertilizer (X4) Feed (X5) Labor (X6)	38,475	>	2.29	0,000	<	0.05	✖	✔

6. Partial Significance Analysis (T Test)

Based on the T test, it is known that the independent variable that has a significant effect on milkfish production is Land area (X1), and Seeds (X3), Fertilizer (X4), Feed (X5). The independent variables that do not have a significant effect on milkfish production are Experience (X2) and Labor (X6).

Table 9.Results of Partial Significance Analysis (T Test)

Hypothesis s	Variable (X)	t_{count}	t <>	t_{table}	sig	Sig <>	sig	H0	Ha
H1	Land area	-3,761	>	1,681	0.001	<	0.05	✖	✔
H2	Experience	-.078	<	1,681	0.938	>	0.05	✔	✖
H3	Seedlings	6,593	>	1,681	0,000	<	0.05	✖	✔
H4	Fertilizer	2,996	>	1,681	0.005	<	0.05	✖	✔
H5	Feed	2,914	>	1,681	0.006	<	0.05	✖	✔
H6	Labor	-1.105	<	1,681	0.276	>	0.05	✔	✖
H7	Capital	-2,052	>	1,681	0.046	<	0.05	✖	✔

7. Faltor - factors that influence the production business of milkfish ponds in Langsa City.
   a. Land area
      Based on respondent data, the total land area is 1,065 ha. With the widest land area of 60 ha and the smallest land area of 4 ha. The largest range of pond land area is 12 – 22 ha, namely 18 respondents and the land area range is at least more than 44 ha, namely 1 respondent.
   b. Experience
      Based on farmer data, the longest experience is 30 years, while the most recent experience is 2 years. The majority of farmers' experience is in the range of 17 – 24 years. This shows that the majority of farmers in Langsa City are experienced.
   c. Seedlings Diversity seeds Which
      equipment costs, ice cube costs, snack costs, costs Eat and cost according to survey data, around 1,000 – 2,000 animals/ha.
   d. Fertilizer
      Fertilization pond This is done to grow milkfish's natural food, for example klekap, moss and phytoplankton. The type of fertilizer used is inorganic fertilizer. The dose used according to respondent data was 150 – 300 kg/ha.
   e. Feed
      Based on data from fish farmers, it shows that farmers feed 90 – 240 kg/ha. Farmers' feed stocking range ranges from 901 – 1,800 kg/harvest season.
   f. Labor
      Based on data from pond farmers, it shows that the number of pond workers is divided into namely workers as pond guards and harvest workers or also called freelance daily workers (PHL). The majority of farmers use a workforce of 10 people.
   g. Capital
      Capital is the total cost of a production business. Capital is divided into two, namely, fixed capital and non-fixed capital. Capital comes from several other capital supporting variables.
      Other capital supports include land costs, seed costs, fertilizer costs, feed costs, labor costs and other costs that support the business. As in this study, researchers found other costs besides the factors that are thought to influence the milkfish production business, namely drink.

4. CONCLUSION

Factors that have a real influence on the production of traditional milkfish farming businesses in Langsa City include: land area and seeds, fertilizer, feed and capital. Land area and capital have a negative effect on income, while seeds, fertilizer and feed have a positive effect on income. If the land area and capital are increased, there will be a reduction in income. If seeds, fertilizer and feed are added, there will be additional income. This means that the production of milkfish ponds in Langsa City, especially in Cinta Raja Village, Alue Dua Village and Seuriget Village is not yet optimal, because there are still opportunities to develop and increase production results. Judging from the average results of the production analysis of the milkfish pond business, it was found that the RC/ratio was 1.61 BC/ratio of 0.61 and the BEP was IDR 28,468,542,- or 1,483 fish. The income of farmers from the milkfish farming business is quite large, even. The average income of farmers is IDR 3,355,944/ha, even though production results are not yet optimal. This indicates the need for further development and evidence that this business can improve the community's economy. Model/strategy Production management of milkfish pond businesses in Cinta Raja Village, Alue Dua Village and Seuriget Village are:

1. Selecting seeds, choose seeds that are slightly larger than usual. Even though the price is quite expensive, the mortality rate will be smaller,so maintenance will be better and shorter.

2. Feeding, feeding is only done one month before harvest, so it will reduce feed costs.
3. Fertilization, the fertilizer used is inorganic fertilizer and the fertilizer dosage ranges

Recommendation

1. Optimizing pond land.
2. Increase seed stocking density.
3. Provision of additional capital from third parties.
4. Review how to share profits with business partners.
5. There is a need for further research on the negative impacts and limitations of the use of inorganic fertilizers on the production of milkfish farming businesses.

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