

Profile of Pig Farming in Bitung City of North Sulawesi

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ABSTRACT

This study aims to analyze the profile of pig farming, such as a) the social characteristics of pig farmers, b) the economic characteristics of pig farming (pig farm income and the factors that influence it), and c) the productivity characteristics of pig farming (the number of pig mating per year, the litter size and the number of weaned piglets). This study used a survey method for pig farmers in Ranowulu, Matuari, Girian and Aertembaga, by taking 20 pig farms with a total of 80 samples. The results showed that the social characteristics of pig farmers in Bitung City were 50% of farmers aged 40-57 years old, there were 45% of farmers who graduated from junior high school, and there were 45% who had more than 15 years of farming experience. The economic characteristics of pig farmers are shown by the total profit of pig farming, which is IDR8,783,674 or 26.39% of the total household income. The factors that influence the total income of pig farming are the amount of pig production, feed costs, depreciation costs of cage and social costs. The productivity characteristics of pigs are shown by the number of pigs mating per year is 2.5 times, the litter size is 10.5 pigs, and the number of weaned piglets is 9 pigs.

Keywords: pig farming, economic characteristics, social characteristics, productivity characteristics

INTRODUCTION

Pig farming is a promising agricultural sub-sector to be developed in the city of Bitung. Based on data on the number of livestock from several sub-

districts in the city of Bitung, it is known that in 2018, the pig population was the highest, which was 27,525 heads, followed by cattle and goats ^[1]. Although it is an industrial area because it is supported by sea ports, the agricultural sector contributes to the regional economy at 24.03%, including the pig farming business. Pig farms in the city of Bitung are generally traditionally maintained side businesses, but contribute to household income which is 28.5% of total household income ^[2].

Livestock managed by rural communities is generally a side business, with low numbers of livestock (under 10 heads), not oriented to the market demand for meat products, and only a few farmer groups develop agribusiness systems and businesses. Even though the business of livestock is still a mainstay as a source of income, meat producers as well as providers of employment ^[3-7]. Other studies state that pig farms managed by the community can be categorized as breeding and fattening businesses with limited numbers of livestock ownership ^[8].

However, there are three categories of pig farming: breeding, fattening and combination breeding-fattening ^[9]. Furthermore, there are factors in the socio-economic characteristics of farmers, played an important role in managing the business, including pig farming ^[10]. Other characteristics that are not less important in pig farming are the role of pig farmers often taken by their wives ^[11]. The characteristics of farmers will later form the mindset of

farmers in handling the livestock cultivation process that can reflect the success of their business. The socio-economic characteristics of farmers, such as age, education level, business experience, number of household members, are also important in pig farming. Based on this description, this study aims to analyze the profile of pig farming, such as a) the social characteristics of pig farmers, b) the economic characteristics of pig farming (pig farm income and the factors that influence it), and c) the productivity characteristics of pig farming (number of pigs mating per year, the number of piglets born for each sow, the number of piglets weaned).

MATERIALS & METHODS

Sampling Methods and Data Collection

This research was conducted in Bitung City in July-September 2019 using a survey method on 80 pig farmers in Ranowulu, Matuari, Girian and Aertembaga, using the multistage random sampling method^[12]. Primary data were obtained from pig breeding models using interview methods, while secondary data were obtained from Department Food Security and Agriculture Agency of Bitung City and also related institutions.

Statistical Analysis

The research objective was to determine the social characteristics of pig farmers and the productivity of pigs, analyzed using descriptive methods, while to determine the total income of pig farming and the factors that influence it, using the following equations^[13].

$$\pi = TR - TC \dots \dots \dots (1)$$

Where, π = revenue, TR = total revenue, and TC = total cost. Furthermore, the following multiple regression equation with natural logarithms is used to analyze the factors that affect the income of pig farming, then the econometric analysis is carried out using the eviews 9.0 program.

$$Y = a + a_1X_1 + a_2X_2 + a_3X_3 + a_4X_4 + a_5X_5 + u_1 \dots \dots \dots (2)$$

Where

- Y = total income (IDR/year)
- X₁ = amount of production (kg/year)
- X₂ = feed cost (IDR/year),
- X₃ = labor cost (IDR/year),
- X₄ = cage depreciation cost (IDR/year)
- X₅ = social cost (IDR/year)

RESULT AND DISCUSSION

The Social Characteristics of Farmers

Characteristics of farmers included breeders' profile, age, education level, breeding experience, number of household members, and membership in pig farmers groups. The distribution of age of pig farmers in Bitung City, North Sulawesi Province is in the range of 35-49 years, then pig farmers are at most 40-57 years old, around 50.0%, and at least <35 years old around 10%. This situation explains that pig farmers have the physical ability to run a pig farm. The results of in-depth interviews were informed that the farmer who was >57 years old had no longer run a pig farm but had left the business to his son. Therefore, pig farm business is often an inheritance or business that has been carried out from farm households for generations.

The level of education of farmers that farmers who completed their education in Junior High School were the most in Bitung City, around 45.0%. Based on these conditions it can be seen that pig farmers are quite able to absorb information about pig farms that they can obtain through print and electronic media. The education level of breeders' wives in this study was included as one of the variables because there was one phenomenon that pig farms were generally managed by farmers' wives. This situation is related to the fact that farmers work on their main business such as corn and coconut farming, while the farmer's wife works on the side business of the household. The education level of the pig farmers' wives in Bitung City is 55.0% which completed their education in Junior High Schools.

The business experience of pig farmers can be determined based on how long the farmers use to manage pig farms.

The pig farmers in Bitung city on average have been cultivating pigs for 15 years. Pig farming is a side business because in their daily lives they only spend around 2 hours per day, which is 1 hour in the morning and evening to clean the cage and bathe the pigs.

The number of children attending school in farm households averages 2 children. With family members attending school, farmers will be increasingly motivated to increase family income to meet the school's needs of children. Until now, pig farming is one way to save for farmers. Pigs are still considered to be savings that can be taken to be used when needed. Based on the results of in-depth interviews with farmers, it was found that there were farmers who could send their children to complete education in college, only by raising pigs.

There were 22 farmers who joined the group, while 58 other farmers did not join the group. Based on the results of the study, it is known that farmers who are members of a group of pig farmers are a group that receives CSR funds from PT MSM and TTM. In its activities, the group does not have activities for business development, but is only formed based on the purpose of obtaining CSR funds from a company.

The Productivity Characteristics of Pig Farming

The productivity of pigs can be measured based on the number of litter per year, the litter size and the number of weaned piglets ^[14]. The number of pigs mating per year and the litter size illustrates the reproductive quality of sows, while the number of weaned piglets illustrates the ability of sows to be combined with the role of farmers to maintain the litter size and the number of weaned piglets. The number of pigs mating per year is 2.5 times, the litter size is 10.5 pigs, the number of weaned piglets is 9 pigs.

The mortality of pre-weaning piglets, due to the low birth weight of the

piglets, is also due to the low knowledge of farmers about the management of nursing sows. Farmers generally only provide feed for sows, but they do not handle the piglets after birth, such as keeping the piglets in order to get enough milk from the sows even though there are nipples that are no longer actively producing milk.

The Economic Characteristics of Pig Farming

Based on the results of research and calculations on the characteristics of pig farming, it can be seen that the amount of revenue and costs in pig farming is described in table 1 below.

Table 1: Revenue and Costs of Pig Farming in Bitung City

Number	Information	Amount (IDR/year)
1	Revenue	
	Capital (sows)	15,437,500
	Sales of Fattening Pigs	56,270,000
	Total Revenue	71,707,500
2	Cost	
	Fix Cost	
	Depreciation of cage	1,670,000
	Variable Cost	
	Feed	41,446,326
	Labor	7,500,000
	Purchase of piglets	10,920,000
	Social costs	1,387,500
	Total Cost	62,923,826

Based on table 1, it is known that the cost of feed is 65.86%, the cost of purchasing piglets is 17.35%, labor costs are 11.9% and social costs are 2.20% of the total cost. In reality, farmers do not spend money on weaning piglets for fattening, because the piglets are born from the sows they own. In addition, labor in pig farming uses family labor such as father or mother, so farmers do not spend money to pay for labor. However, in this study, all costs were calculated to be used in calculating the total cost of pig farming. The total income of pig farming is the result of a reduction between the total revenue and the total cost, so that the total income is IDR8, 783,674/year. The results of the regression analysis to determine the factors that influence the total income of pig farming are described in Table 2.

Table 2: Results of Regression Analysis of Factors Affecting Pig Farming Income in Bitung City

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	-160802.800	8663722.000	-0.018	0.985
the amount of pig production	31269.700	1131.373	27.638	0.000
feed costs	-1.321	0.050	-26.006	0.000
labor costs	-0.536	1.138	-0.471	0.638
depreciation costs of cage	-0.550	0.149	-3.690	0.000
social costs	-2.765	0.623	-4.434	0.000
R-squared	0.919			
Adjusted R-squared	0.914			
F-statistic	168.972			

Source: Data Analysis, 2020

Based on the results of the regression analysis shown in Table 3, it is known that the factors of total production feed costs, labor costs, depreciation costs of cage and social costs, together have an effect on the total income of pig farming. ($P < 0.001$) The amount of production factor has a significant effect on total income ($P < 0.001$), that is, an increase in the amount of pig production will increase the amount of income from pig farming^[14-15]. The factors of feed costs, depreciation costs of cage and social costs have a negative effect on the total income of pig farming ($P < 0.001$), that is, an increase in costs causes a decrease in the total income of pig farming^[16]. This situation is in accordance with the criteria of farming economics and it is in accordance with several studies that have also been carried out on other farms^[17-18]. Pig farming is a side business that can contribute to household income, as described in table 3.

Table 3: Contribution of Pig Farming to Household Income

Information	Income/year (IDR)
Coconut Farming	14,000,000
Corn Farming	10,500,000
Pig Farming	8,783,674
Amount	33,283,674

Source: Data analyzed, 2020

Based on table 3, it is known that the total farm household income is IDR 33,282,674/year or IDR2, 773,640/month. The contribution of pig farming is IDR8,783,674 or 26.39% of the total household income.

CONCLUSION

The results showed that the social characteristics of pig farmers in Bitung City were 50% of farmers aged 40-57 years old, there were 45% of farmers who graduated

from junior high school, and there were 45% who had more than 15 years of farming experience. The economic characteristics of pig farmers are shown by the total profit of pig farming, which is IDR8,783,674 or 26.39% of the total household income. The factors that influence the total income of pig farming are the amount of pig production, feed costs, depreciation costs of cage and social costs. The productivity characteristics of pigs are shown by the number of pigs mating per year is 2.5 times, the litter size is 10.5 pigs, and the number of weaned piglets is 9 pigs.

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