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# Income Analysis of Kalang Buffalo Farmers in the Tanjung Terakan Group Kutai Kartanegara Regency

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**Abstract**
*Buffalo farming is an integral part of Indonesia's agricultural system, particularly in the Tanjung Terakan group, Muara Wis District, Kutai Kartanegara Regency. Small-scale farmers in this area raise kalang buffaloes as a secondary enterprise, utilizing family labor. This study aims to assess the profitability and performance of buffalo farming in this region. The research employed a survey method to gather data on production costs and income of the farmers. The findings revealed that the average annual income of the Tanjung Terakan group is IDR 134,549,211.00, with a remarkable profit margin of 2,247%. Despite a 9% yearly interest rate charged by Bank Kaltimtara, the buffalo business in this area remains lucrative. Based on these results, it is recommended that the Tanjung Terakan group continue their buffalo farming efforts due to the significant value it brings.*

**Keywords**: *Analysis of Income; Kalang Buffalo Farming; Farmer's Income; Business Feasibility*

## 1. Introduction

The livestock sector plays a crucial role in the nation's economic growth. Farms play a vital role in meat production by influencing capital formation, food output, industrial materials, job creation, foreign currency, income generation, and environmental conservation through sustainable farming methods. There is a promising future for the expansion of animal agriculture due to an increase in demand for products derived from livestock, which correlates with population growth, higher incomes, and a growing focus on consuming healthy foods [1]. Changes in consumption patterns, favoring animal protein, have been influenced by the rate of population growth, improvements in living standards, and shifts in consumer preferences. Buffalo farming is predominantly undertaken in rural areas by individuals and communities, serving as a crucial source of income for families. Many people are involved in fattening buffaloes, whereby young buffaloes are raised in pens and fed to enhance the quality and quantity of meat in a short period.

The buffalo is livestock that has a wide range of agro-system development, allowing it to be found in almost all provinces in Indonesia [2]. The consumption of animal protein continues to increase due to the growing population in Indonesia. The large number of buffalo being raised can serve as a supporting factor in improving the productivity of the red meat supply. The buffalo farming effort is significant in the people's livestock system in Indonesia; however, in its intensive management and maintenance patterns, it is only the livestock farming of the people that is traditionally maintained and serves as a side business, utilizing family labor with a small-scale operation. Buffalo, as farm animals, have their advantages and disadvantages. Buffalo farmers frequently encounter challenges such as low reproduction rates, poor seed quality, inadequate feed quality, frequent inbreeding, lack of farmer knowledge, and a lengthy gestation period [3]. Buffalo's extended production period and ability to convert protein-rich feed into high fiber content make them valuable for producing meat and milk [4]. Buffalo production can reach its

full potential by enhancing livestock management practices [3]. The Kalang buffalo is recognized as a superior breed due to its remarkable ability to thrive in challenging environments and weather conditions. These buffaloes are crucial in agricultural activities such as plowing fields and hold significant cultural and economic value in rural areas. Moreover, they serve as an important source of animal protein for communities in various regions [5].

In the future, community farming needs to focus on the development of livestock agribusiness so that it not only becomes a supplementary venture but also provides economic benefits for families [6]. Smallholder farming can be a primary source of income and beneficial for meeting family needs, including economic activities and family businesses. Caring for buffalo involves selecting seeds, providing feed, housing systems, management, administration, and marketing. Meanwhile, the economic aspect that needs to be considered is identifying net income through revenue analysis to maintain the effectiveness and stability of the business.

Despite their great potential, Kalang buffalo farmers often face various challenges that can impact their income. These include market price fluctuations, rising feed costs, limited access to modern technology, and insufficient government support [7]. Furthermore, many farmers continue to rely on traditional, inefficient methods in animal husbandry, leading to low productivity. These obstacles could hinder the progress of Kalang buffalo farming and reduce its benefits for farmers and the village economy in general [8]. In addition to economic issues, there are also social problems that impact Kalang buffalo farming. For example, demographic changes in rural areas, such as the migration of young workers to urban areas, can result in a decrease in the available workforce for farming. However, knowledge about effective farm management is often limited, especially among small farmers who inherit their businesses without formal training [9]. Exploring the factors that influence the income of Kalang buffalo farmers and seeking solutions to improve their welfare through better business management. Evaluating the income of farmers is vital, not only to assess current economic performance but also to plan strategic development steps to enhance the profitability and sustainability of Kalang buffalo farming in the future [10].

The calculation of revenue involves deducting operational costs from the sales revenue received during the production process. It is crucial to consider both fixed and variable production costs in agricultural endeavors. In income research, various socioeconomic factors, such as the scale of the business, age, education, farming experience, and the number of family dependents, can influence income and livestock population [11]. This study aims to determine the income level of kalang buffalo farmers in the Tanjung Terakan Group, Muara Wis District, Kutai Kartanegara Regency.

## 2. Materials and Methods

This study used survey research as its research methodology. The location is determined using purposive sampling, which involves intentionally selecting the livestock group engaged in Kalang buffalo farming in Muara Wis Village. The respondents are determined through a census, including all 13 members of the Tanjung Terakan livestock farmer group. The research data collected comprises primary and secondary sources. Primary data was obtained through direct observation and interviews with respondents using a questionnaire as a guide. It includes income from buffalo farming operations, production expenses, and capital sources. Secondary data was acquired from relevant government agencies and literature related to the research, such as the selling price of live buffalo per kilogram and prevailing bank interest rates. The data collected will be analyzed descriptively and quantitatively using formulas to assess the income of farmers and the profitability of the members of the Tanjung Terakan livestock farmer group.

### Income Analysis

After conducting interviews with Kalang buffalo farmers, data was collected for income analysis to calculate production costs, revenue, and income from the Kalang buffalo farming business. The following mathematical formula [12] was used:


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TC = TFC + TVC

TR = P x Q

$\pi$ = TR – TC

Description:

TC : Total Cost (IDR/year)
TFC : Total Fix Cost (IDR/year)
TVC : Total Variable Cost (IDR/year)
TR : Total Revenue (IDR/year)
P : Price (IDR)
Q : Quantity Product (tail)
$\pi$ : Income from Kalang buffalo farming (IDR/year)

**Analysis *Return Cost Ratio* (RCR)**

When the Revenue-Cost Ratio (RCR) is above 1 or if the total revenue exceeds the total production costs, the business is making a profit. Conversely, an RCR below 1 indicates a loss for the business, with total revenue falling short of total production costs. The RCR value can be calculated using the following formula:

$$RCR = \frac{\text{Total Revenue}}{\text{Total Cost}}$$

Description:

RCR : *Revenue cost ratio*

## Profitability

Profitability is a critical indicator of a business's viability. If the business's profitability surpasses the bank interest rate, it is deemed viable. Conversely, if the profitability falls below the bank interest rate, the business is not considered profitable. This is the formula for profitability [13]:

$$R = \frac{X}{Y} \times 100\%$$

Description:

R : Profitability value
X : Business profit
Y : Total production cost

## 3. Results and Discussion

**Characteristics of the respondents**

Thirteen respondents, all members of the Tanjung Terakan Livestock Group actively engaged in buffalo farming, were interviewed and directly observed in the field in Muara Wis Village, Kutai Kartanegara Regency.

**Farmer's age**

Based on the findings in Table 1, it is evident that the Tanjung Terakan group's age composition significantly influences both their physical condition and mindset. These factors, in turn, play a


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crucial role in shaping management patterns and work capacity in business ventures. The group consists of 6 respondents aged 45-54 years (46.2%), 5 respondents aged 55-64 years (38.5%), and 2 respondents aged 35-44 years (15.4%).

Productivity in farming is directly influenced by the age of the farmer and the efficiency being implemented. Younger farmers with better physical and mental strength tend to manage livestock more efficiently. They are more inclined to diversify their business and try new strategies that can increase revenue. On the other hand, older farmers may experience physical limitations that hinder their ability to manage their farms as effectively as possible [14]. The level of technology adoption among Kalang buffalo farmers is also closely related to age. Research shows that young farmers are more likely to adopt technologies such as fermented feed, data-driven livestock health management, and the use of modern equipment. Meanwhile, older farmers may struggle to accept these changes due to limited knowledge or discomfort with new technology [15]. Although young farmers are more creative, older farmers are often seen as keepers of valuable traditions and local knowledge. They have firsthand experience that can be passed on to the younger generation, thus preserving the continuity of farming practices that may have been in place for a long time. Collaboration between generations is necessary for the Kalang buffalo farming business to continue to thrive. Innovative young farmers, while older farmers preserve tradition and local knowledge. They have firsthand knowledge that can be passed on to younger generations, ensuring the continuity of farming practices that may have been in place for years. Therefore, intergenerational cooperation is essential for Kalang buffalo farming to continue to thrive and progress in the future [16].

**Table 1.** Identity of farmers based on age

| Age (years) | Quantity (person) | Percentage (%) |
|---|---|---|
| 35 - 44 | 2 | 15.4 |
| 45 - 54 | 6 | 46.2 |
| 55 - 64 | 5 | 38.5 |
| Total | 13 | 100 |

Source: Primary data analysis, 2022

**Level of education of farmers**

Based on the data in Table 2, it is evident that the majority of respondents from the Tanjung Terakan livestock group have a high school education background, comprising 7 individuals (53.8%). Education significantly impacts income, as it influences a person's capacity to absorb information, attitudes, knowledge, and behavior [17]. Additionally, there are five respondents with a junior high school education (38.5%) and one respondent with a bachelor's degree (7.7%).

**Table 2.** Identity of farmers based on education background

| Education level | Quantity (person) | Percentage (%) |
|---|---|---|
| Junior high school | 5 | 38.5 |
| Senior high school | 7 | 53.8 |
| University | 1 | 7.7 |
| Total | 13 | 100 |

Source: Primary data analysis, 2022

**The primary responsibility of the farmers**

**Table 3.** Identity of farmers based on primary responsibility

| Profession | Quantity (person) | Percentage (%) |
|---|---|---|
| Fishermen | 4 | 30.8 |
| Farmer | 5 | 38.5 |
| Teacher | 1 | 7.7 |
| Government honorary | 1 | 7.7 |
| Entrepreneur | 2 | 15.4 |


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| | | |
|---|---|---|
| Total | 13 | 100 |

Source: Primary data analysis, 2022

Based on Table 3, the majority of participants from the Tanjung Terakan group are farmers, making up 38.5% of the total with 5 individuals. 4 respondents are working as fishermen (30.8%), 2 respondents are entrepreneurs (15.4%), 1 respondent works as a teacher (7.7%), and 1 respondent is a government honorary (7.7%). It's important to note that the raising of buffalo is currently considered a supplementary occupation and has not yet transitioned into a primary commercial venture [18].

**Experience of a farmers**

In the Tanjung Terakan group of livestock farmers, 46.2% of the 6 respondents have 20-29 years of farming experience, while 38.5% of the respondents have 40-49 years of experience, and 15.4% have 30-39 years of experience, as presented in Table 4. Research [3] suggests that longer farming experience can enhance business management abilities, influence farmers' attitudes, increase technology adoption, and improve decision-making. Farmers' experience allows them to learn from past mistakes, be more cautious, and potentially increase their income, influencing their acceptance of innovations. This business experience helps farmers develop their livestock enterprises and improve their skills.

**Table 4.** Identity of farmers based on farming experience

| Farming experience (years) | Quantity (person) | Percentage (%) |
|---|---|---|
| 20-29 | 6 | 46.2 |
| 30-39 | 2 | 15.4 |
| 40-49 | 5 | 38.5 |
| Total | 13 | 100 |

Source: Primary data analysis, 2022

**Production cost**

Production costs pertain to the money or investment needed by farmers to develop products or services for their farming business to thrive. These costs comprise variable costs, which fluctuate, and fixed costs, which remain constant. Variable costs change in line with the volume of activities, while fixed costs stay constant irrespective of the level of activity [19]. The production costs in Kalang buffalo farming are an important factor that influences the sustainability and profitability of the farming business. Farmers need to understand the components of production costs to improve the efficiency of their business and their income [20]. Further details on this can be found in Table 5, which illustrates the average production costs of the Tanjung Terakan Livestock Group.

**Table 5.** Average production cost incurred by the members of the Tanjung Terakan group

| Types of cost | Cost (IDR/year) |
|---|---|
| Variable costs | |
| Feeds cost | 1.153.846,00 |
| Drugs cost | 38.462,00 |
| Vaccine cost | 2.157.692,00 |
| Fixed costs | |
| Electricity cost | 115.385,00 |
| Depreciation cost | 439.250,00 |
| Members cost | 1.507.692,00 |
| Transportation | 576.923,00 |
| Total | 5.989.251,00 |

Source: Primary data analysis, 2022

Based on the information provided in Table 5, it can be inferred that the buffalo farmers belonging to the Tanjung Ternak Group have an average annual production cost of IDR


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5,989,223.00. The production costs consist of both variable and fixed costs. The variable costs include vaccine expenses of IDR 2,157,692.00, feed expenses of IDR 1,153,846.00, and medication expenses of IDR 38,462.00 per year. Meanwhile, the fixed costs include member contributions, transportation, depreciation, and electricity, with each amounting to IDR 1,507,692.00, IDR 576,923.00, IDR 439,250.00, and IDR 115,385.00 per year, respectively.

**Income**

Product acceptance is the revenue received by producers from the sale of their goods, calculated by multiplying the quantity of products by their selling price. This type of revenue is also known as total operating revenue, as it is not deducted from the total production costs. Information regarding the average income received by buffalo farmers who are members of the Tanjung Terakan Group can be found in Table 6.

**Table 6.** Average income received by members of the Tanjung Terakan group

| Explanation | Buffalo quantity | Income (IDR/year) |
|---|---|---|
| Buffalo | 77 | 124.384.615,00 |
| Calf | 21 | 16.153.846,00 |
| Total | 98 | 140.538.462,00 |

Source: Primary data analysis, 2022

The Tanjung Terakan livestock group derives its income from the sale of adult buffaloes and calves. The farmers' income is directly impacted by the number of animals they own, which is determined by multiplying all production results by the selling price. According to Table 6, the average annual income of the Tanjung Terakan livestock group members is IDR 124,384,615.00, primarily from 77 buffalo, with an additional IDR 16,153,846.00 coming from 21 calf calves. Altogether, the total average income of the Tanjung Terakan group members amounts to IDR 140,538,462.00 per year, from the sale of 98 livestock.

**Revenue**

Revenue is the amount obtained after subtracting the total production costs from the receipts. The total production cost is the sum of fixed costs and variable costs. The average revenue can be found in Table 7.

Based on the data in Table 7, members of the Tanjung Terakan livestock group receive an average annual income of IDR 140,538,462.00. Meanwhile, the average production cost incurred by members of the Tanjung Terakan group is IDR 5,989,251.00 per year, resulting in a net income of IDR 134,549,211.00 per year for the members. According to a study [21], a farmer's income is dependent on the size of their livestock ownership, which can impact both production costs and the farmer's revenue.

**Table 7.** Average revenue received by members of the Tanjung Terakan group

| Explanation | Total (IDR/year) |
|---|---|
| Income | 140.538.462,00 |
| Production cost | 5.989.251,00 |
| Revenue | 134.549.211,00 |

Source: Primary data analysis, 2022

**Return Cost Ratio (RCR) Analysis**

Return Cost Ratio (RCR) is a financial indicator used to measure the efficiency and profitability of a business, including in the field of livestock farming. RCR is a ratio that describes the relationship between total business revenue and total costs incurred. In the context of Kalang buffalo farming, RCR is used to assess whether the farming venture is profitable and whether the costs are proportional to the income generated [22].

The Revenue-Cost Ratio (RCR) is obtained by dividing the total revenue by the total production cost. In the case of the crossbred buffalo enterprise in the Tanjung Terakan livestock group, the


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RCR value is 23.5, calculated as 140,538,462.00 divided by 5,989,251.00. Based on the evaluation of the RCR, it indicates that the crossbred buffalo business is profitable, as the RCR value exceeds 1.

**Profitability Analysis**

Profitability research is the process of evaluating how effectively the Kalang buffalo farming business generates profits from its operations. This analysis is crucial for farmers to understand their financial performance and make strategic decisions regarding business development. Profitability not only indicates the financial condition of a company but also reflects the management's skills in resource management [23]. Profitability ratio = (Operating profit / Total production cost) x 100%. The profitability value for the Kalang buffalo business in the Tanjung Terakan group is calculated as: (134,549,211.00 / 5,989,251.00) x 100% = 2,247%. Based on the profitability analysis, the buffalo farming business is considered feasible, as its profitability value exceeds the prevailing bank interest rate in the research area, which is the 9% annual interest rate for the Ternak Sejahtera loan from Bank Kaltimtara.

Various strategies to enhance the profitability of Kalang buffalo farming include producing milk, meat and hides from buffaloes, as well as using the high-quality feed to improve growth and milk production. Vaccination programs and routine care are also necessary to maintain livestock health and enhance profitability. Increasing the number of livestock in the business will help improve cost efficiency and profit margins. Using technology in farm management, such as data-driven livestock management systems, can improve efficiency and reduce operational costs.

## 4. Conclusion

Based on the research conducted on the Kalang buffalo business in the Tanjung Terakan group, we can make the following recommendations:

1. The annual production cost for the Kalang buffalo business in the Tanjung Terakan group is IDR 5,989,251.00, consisting of both variable and fixed costs.
2. The Tanjung Terakan group received an annual income of Rp. 140,538,462.00 from the Kalang buffalo business, generated from the sale of adult female buffaloes and calves.
3. The Tanjung Terakan group earns an annual income of Rp. 134,549,211 from their Kalang buffalo business. It's noteworthy that the Tanjung Terakan livestock group's profitability exceeds the 9% interest rate of Kaltimtara Bank, demonstrating significant and worthwhile profits.

Establishing cooperatives or agricultural/livestock business groups is essential for improving production management. This includes selecting high-quality seeds and providing efficient feed. Additionally, there is a need to ensure the supply of animal feed and effectively distribute the products that are produced.

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