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PROSPECTS OF HOUSEHOLD SCALE VANAME SHRIMP FARMING BIOFLOC SYSTEM

Prospek Usaha Budidaya Udang Vaname Sistem Bioflok Skala Rumah Tangga

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ABSTRACT

Soropia Village is a coastal area that is topographically potential for developing a biofloc shrimp farming business on a household scale, in addition this system reduces negative environmental impacts. However, it is necessary to study the potential in terms of the amount of costs, production potential and profits that can be obtained, and business feasibility. The research method used was a case study at the Bahari Jaya Group. Primary data was obtained using a survey technique through in-depth interviews regarding the variables needed in the analysis to achieve the research objectives. The results of the study showed that the largest investment cost was for the allocation of making a complete package pond, in the form of a D4 biofloc tarpaulin pond (4 meters in diameter) on a household scale of IDR 3,500,000.00. While the most dominant operational cost is the purchase of feed of IDR 1,800,000, but this amount is considered minimal in the vaname shrimp farming business, because of the biofloc element which is additional feed. The biofloc system vaname shrimp cultivation business on a household scale in 1 cycle maintained for 3 months, the total cost incurred was IDR 8,532,500, - and the production was 170 kg with a selling price of IDR 98,000 / kg, thus obtaining an income of IDR 16,660,000, -. The profit obtained was IDR 8,127,500, - with a business feasibility level of 1.9. This value is classified as feasible so that the biofloc system vaname shrimp cultivation business is very prospective to be implemented and applied on a household scale to improve the welfare of coastal communities.

Keywords: Biofloc, Cost, Feasible, Shrimp

ABSTRAK

Desa Soropia merupakan wilayah pesisir yang secara topografi potensial untuk dikembangkan usaha budidaya udang vaname sistem bioflok skala rumah tangga, selain itu sistem ini mengurangi dampak lingkungan negatif. Namun perlu kajian potensi dari aspek besaran biaya, potensi produksi dan keuntungan yang bisa diperoleh, serta kelayakan usaha. Metode penelitian dilakukan berupa studi kasus (*case study*) pada usaha. Data primer diperoleh menggunakan

teknik survey melalui wawancara mendalam mengenai variabel yang dibutuhkan dalam analisis untuk mencapai tujuan penelitian. Hasil penelitian diperoleh bahwa biaya investasi yang terbesar adalah untuk alokasi pembuatan kolam paket lengkap, berupa kolam terpal bioflok D4 (diameter 4 meter) skala rumah tangga sebesar Rp3.500.000,00. Sedangkan biaya operasional yang paling dominan adalah pembelian pakan sebesar Rp1.800.000, namun jumlah tersebut tergolong minimum dalam usaha budidaya udang vaname, karena adanya unsur bioflok yang menjadi pakan tambahan. Usaha budidaya udang vaname sistem bioflok skala rumah tangga dalam 1 siklus yang dipelihara selama 3 bulan, total biaya yang dikeluarkan sebesar Rp8.532.500 dan produksi sebanyak 170 kg dengan harga jual sebesar Rp98.000/kg, sehingga memperoleh penerimaan sebesar Rp16.660.000. Keuntungan yang diperoleh sebesar Rp8.127.500 dengan tingkat kelayakan usaha sebesar 1,9. Nilai tersebut tergolong layak sehingga usaha budidaya udang vaname sistem bioflok sangat prospek untuk diterapkan dan diaplikasikan dalam skala rumah tangga guna meningkatkan kesejahteraan masyarakat pesisir.

Kata Kunci: Biaya, Bioflok, Layak, Udang

INTRODUCTION

Soropia Village is one of the coastal villages included in the administrative area of Soropia District, Soropia Village is famous for having abundant marine fishery resource potential. Although the Soropia Village area is topographically located above the mountains and hills, the entire northern village area borders the sea. Interestingly, Soropia Village has Soropia Bay which has high biodiversity, so that currently Soropia Bay is used as a center for Floating Net Cage (KJA) cultivation for white fish, grouper and lobster commodities. In addition to the KJA business, the biofloc system vaname shrimp cultivation business on a household scale also has the potential to be developed in Soropia Village. In addition, according to (Suderajad *et al.,* 2024) the increasing market demand for vaname shrimp provides attractive business opportunities in the fisheries industry, increasing interest in managing shrimp cultivation as a very promising economic alternative.

The vaname shrimp cultivation business opportunity with the biofloc system is promising because this system reduces negative environmental impacts and operational costs (Hanisa, *et al.,* 2012). Biofloc technology is a technology that uses waste materials from existing feed residues, into microbial feed, so that the material from organic waste is degraded and microbes can grow which then form a group of microbes that will mix with other organic colloids (Burford *et al.,* 2004; De Schryver *et al.,* 2008). Biofloc technology is a technological breakthrough that is currently being developed by combining the handling of waste from a cultivation result and reducing the amount of water use. In general, the advantages of this technology are lower operational costs, high survival rates (Azim *et al.,* 2007). By utilizing biofloc technology, vaname shrimp entrepreneurs can control water quality and maintain the cleanliness of the cultivation environment, thereby increasing shrimp productivity. Aguilera-Rivera *et al.,* (2014) said biofloc can improve growth performance and help maintain good water quality in running a shrimp farming business. This is because biofloc consists of media that is abundant in organic materials, namely, phytoplankton, bacteria, nematodes, filamentous bacteria, friendly protozoa, ciliates, rotifers and also flagellates.

The application of the biofloc system in household-scale vaname shrimp cultivation offers great opportunities, especially for people who want to do business with limited capital but have broad market potential. The prospects for this business are increasingly wide open along with the high demand for healthy and high-quality shrimp products. With a proper understanding of cultivation techniques and biofloc system management, household-scale fishermen can obtain maximum results with relatively affordable investments. Therefore, the prospects for vaname shrimp cultivation with a household-scale biofloc system have great

potential to be developed and can become a profitable source of income for the community.

The prospect of a household-scale biofloc vaname shrimp farming business must of course be supported by a potential analysis of the financial/financial aspects, so this study is important to identify the costs and benefits of vaname shrimp farming with the biofloc system.

This study aims to measure the prospects according to the amount of initial investment costs, operational costs, and income projections from a household-scale vaname shrimp farming business. With this analysis, it is expected to be able to calculate the estimated profits obtained from cultivation using the biofloc system.

METHODS

Time and Place

The research was conducted in July - December 2023, conducted in Soropia Village, Soropia District, Konawe Regency, Southeast Sulawesi. The research method used was a case study on the Bahari Jaya Group. The data collection technique used in this study was the survey method, data was obtained through observation and observation, recording, documentation, literature review. The method used in this study used quantitative and descriptive qualitative methods. The types of data used in this study consisted of primary and secondary data.

Data Analysis

To answer the research objectives, an identification of the initial investment costs used, operational costs, revenue projections and profits obtained from cultivation using the biofloc system was carried out. The analysis uses the cost analysis formula:

$$TC = TFC + TVC$$

Description:
TC = Total Cost/Cycle (IDR)
TFC = Total Fixed Cost/Cycle (IDR)
TVC = Total Variable Cost/Cycle (IDR)

Projected revenue with the formula:

$$TR = P.Q$$

Description:
TR = Total Revenue/Cycle (IDR)
P = Product Selling Price (IDR/Kg)
Q = Production Quantity/Cycle (Kg)

Profit analysis with the formula:

$$\pi = TR - TC$$

Description:
π = Revenue (IDR/Cycle)
TR = Total Revenue (IDR/Cycle)
TC = Total Cost (IDR/Cycle)

RESULTS

Investment costs in a household-scale vaname shrimp farming business with a biofloc system are the total expenditure required to start the farming business, which includes all initial costs incurred to build infrastructure and purchase the necessary equipment. These investment costs are long-term and are costs that may not be repeated after the business is running. The

details of the investment costs are presented in the following table.

Table 1. Description of the Amount of Initial Investment Costs for Household-Scale Vaname Shrimp Farming Business

No	Description	Volume	Unit	Price (IDR)	Amount (IDR)
1	Pond Construction (Complete)	1	Package	3,500,000	3,500,000
2	Electrical Installation	3	Month	100,000	300,000
3	Shimizu Water Machine	1	Package	550,000	550,000
4	Aerator	1	Unit	670,000	670,000
5	Thermometer	1	Unit	50,000	50,000
6	pH Meter	1	Unit	300,000	300,000
				Total	5,370,000

Data Source: Primary Data (2023)

The details of production costs for household-scale biofloc system vaname shrimp cultivation are as shown in Table 2.

Table 2. Description of Production Costs Per Cycle in Household-Scale Vaname Shrimp Cultivation

No	Description	Volume	Unit	Price (IDR)	Amount (IDR)
1	Shrimp Seed	12,500	Shrimp	55	687,500
2	Feed	150	Kg	12,000	1,800,000
3	Molasses	5	Liter	80,000	400,000
4	Probiotics	5	Liter	25,000	125,000
5	Salt and Vitamins	1	Package	150,000	150,000
				Total	3,162,500

Data Source: Primary Data (2023)

Based on the results of the analysis of costs, revenues and profits, the results obtained are as shown in Table 3.

Table 3. Results of the Analysis of Costs, Revenues and Profits of Vaname Shrimp Cultivation Business with a Household-Scale Biofloc System

Description	Amount	Unit	Number of Units	Total
Survival Rate	80	%		
Spread	12,500	shrimp		
Total			10,000 shrimp	
Individual Weight	17	gram	size 60	
Total Biomass	170,000	gram	170 kg	
Total Revenue (TR)	170	98,000		16,660,000
Total Cost (TC)				8,532,500
Profit (π)				8,127,500
R/C				1.9

Data Source: Primary Data (2023)

DISCUSSION

The largest investment cost is for the allocation of making a complete package pool, in the form of a D4 biofloc tarpaulin pool (4 meters in diameter) on a household scale of IDR 3,500,000. This value is specifically for the household scale, assuming the business land is

carried out in the yard of the business actor's house. While the lowest investment value is the allocation of the procurement of supporting equipment in the form of a temperature gauge of IDR 50,000. The amount of investment is largely determined by the planning at the beginning of the business period of the business. According to Harahap & Aulia (2022), investment can also be defined as an investment in an activity that will take place in the long term in various business sectors. As a means, investment allows funds to be placed with the hope of generating positive income and maintaining or even increasing its value. Based on this definition, investment can be understood as an activity that involves delaying consumption in the present, with a certain amount of funds and within a certain period of time, in efficient assets. The goal is to obtain future profits that are higher than the current conditions, according to investor expectations. In other words, investment is an investment of funds whose amount is determined by the ability to predict future conditions.

According to Suderajad *et al.,* (2024), that the vaname shrimp cultivation business requires production costs to produce the expected production, the components of production costs in the vaname cultivation business consist of direct operational costs and indirect costs, the operational costs incurred are the amount of costs for purchasing shrimp fry as shrimp seeds, fertilizers, vitamins, lime, and labor during the cultivation process.

Based on Table 2. It can be seen that the most dominant cost is the purchase of feed of IDR 1,800,000, but this amount is classified as a minimum in the vaname shrimp cultivation business, because of the biofloc element which is additional feed. As stated by Manan *et al.,* (2020) that the application of biofloc has succeeded in improving shrimp performance while also making it better, additional natural feed for each shrimp.

While the lowest production cost is the need for probiotics to make biofloc. Munaeni *et al.,* (2023) said that the main composition of this probiotic contains the bacteria *Bacillus* sp., *Pseudomonas* sp., *Nitrosomonas* sp., *Lactobacillus* sp., *Nitrobacter* sp. Furthermore, Ekasari *et al.,* (2014) stated that these probiotic bacteria will provide various benefits, namely the presence of bacteria that function to utilize and decompose organic compounds from dissolved feed residues and waste from cultivated organisms so that it will improve the quality of cultivated water. Various studies have shown that the administration of probiotics can maintain water quality and maintain floc volume during maintenance (Dahlan *et al.,* 2019). In addition, the application of probiotics not only increases feed efficiency and reduces nutrient waste, but also has a positive effect on the immune system of cultivated organisms.

The household-scale biofloc system vaname shrimp cultivation business in 1 cycle maintained for 3 months, the costs incurred were IDR 8,532,500 and the production was 170 kg with a total selling price of IDR 98,000, so that it obtained an income of IDR 16,660,000. The profit obtained was IDR 8,127,500 with a business feasibility level of 1.9. In line with research Bidayani & Valen (2023) that the economic efficiency value of household-scale shrimp cultivation with the biofloc system is 2.39. This value is classified as feasible, as stated by Harahap & Aulia (2022) that the revenue cost ratio (R/C) analysis is used to determine how far each rupiah value of costs used in business activities can provide a number of income values as benefits. A business is said to be feasible if R/C is greater than 1 (R/C > 1). This shows that the higher the R/C value, the higher the level of profit of a business. Business activities that have the largest R/C value mean the most profitable business activities. This is also in line with research Djumanto *et al.,* (2016) that the net profit for the smallest pond (1000-1500 m^2) is IDR 48,702,332/plot/cycle, and for the largest pond (3000-4500 m^2) is IDR 58,131,666/plot/cycle.

Analysis of the business prospects of vaname shrimp cultivation with a household-scale biofloc system has provided information that vaname shrimp cultivation using a biofloc system on a household scale can be profitable and sustainable. Moreover, supported by the right management system and consistent monitoring of water quality and shrimp health, the biofloc

system can be a very promising alternative in overcoming the economic difficulties of fishing families.

CONCLUSION

Biofloc cultivation business is very prospective and has great opportunities to run, because the amount of investment costs and operational costs are very affordable. The value of profit and business feasibility are also quite promising, in addition the advantages of the biofloc system cultivation business are easy to operate and can be applied on a household scale.

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