Available online at: https://proceeding.researchsynergypress.com/index.php/rsfconferenceseries1
RSF Conference Series: Business, Management and Social Sciences
e-ISSN 2807-5803/ p-ISSN 2807-6699
Volume 1 Number 3 (2021): 23-30

Comparative Analysis Of Catfish Cultivation Business Between Breeding And Spanishing (Case Study On Bolopijah Farming Group)

Shinta Heru Satoto[1], Hani Subagio[1], Hasa Nurrohim KP[1]
[1] Universitas Pembangunan Nasional " Veteran" Yogyakarta

Abstract

Profit is an important part of a business because profit is one measure of business success that determines the end of a production cycle. This study seeks to analyze the structure of costs, revenues, and profits in catfish farming. Questionnaires were given to 30 respondents who are members of the Bolopijah Farmers Group, Randugowang Village, Sleman Yogyakarta. The results showed that the costs incurred in the catfish rearing system were greater than the costs in the spawning system. While the income generated in the spawning system is greater than the rearing system. The results of the R/C ratio analysis show that these two cultivation systems have an R/C ratio > 1, so it can be concluded that these two cultivation systems are still profitable and feasible to continue. However, the R/C ratio of the spawning system showed greater results than the rearing system.

Keywords: *Structure of Cost, Revenue and Profit, Rearing System, Spawning System*

This is an open access article under the CC–BY-NC license

INTRODUCTION

Catfish is one of the freshwater fish that has high nutritional content at a relatively low price, has a good taste, is easy to breed, and can be easily maintained in poor water quality and in almost all cultivation containers (Rizal et al., 2018). From these advantages, the catfish farming business is a good business opportunity and can increase income. Nationally, catfish production is quite high. The Ministry of Maritime Affairs and Fisheries (KKP) predicts catfish production this year to be 400,000 tons, up from last year's 346,000 tons. According to the Director General of Aquaculture, KKP, consumption of catfish is still dominated by the Java region as much as 250 tons per day. Besides Jakarta, the largest consumption of catfish is in Yogyakarta. (Daily Cash January 26, 2012). Demand is high enough to make catfish prices stable in the range of Rp. 15,000 to Rp. 16,000 per kg. Where the cost of producing one kilogram of catfish is only Rp. 8,000 so it is very profitable.

From these data, it appears that catfish farming provides good business opportunities and can increase income. Technically, catfish is a type of fish that is easy to cultivate, able to survive in poor water, resistant to disease, can be stocked with high density and fast growth. But in reality, not everyone who engages in catfish rearing business can get the expected results (Prihartono et al., 2010). The obstacle that is often faced in catfish farming is the high cost of production as a result of the high price of feed manufacturers. This will directly affect the profits obtained. In addition, it takes mastery of technology in catfish farming and the availability of seeds insufficient quality and quantity because this is an absolute factor that will determine the success of the business.

Corresponding author
Hasa Nurrohim KP, hasa.nurruhim@gmail.com
DOI: https://doi.org/10.31098/bmss.v1i3.283

The Bolopijah Farmer Group is one of the institutions that invites and provides skills to the surrounding community in meeting their needs. This group is required to be able to generate maximum income in order to meet the needs of life. With the increasing cost of living, the desire arises to be able to live independently by earning their own income. Catfish farming is one of the businesses developed by the Bolopijah Farmers Group. The choice of catfish farming is because the fisheries sector is a sector that has the potential to be developed in rural areas. Moreover, the demand for catfish is increasing.

The Bolopijah breeder group is one of the Bolopijah Catfish Cultivation Groups located in Randugowang Sariharjo Village, Ngaglik Sleman. This group manages a total of 21 pounds on 1500 m2 of land. The catfish rearing system has been using a rearing system, with water sourced from local wells. Over time this group also tried to cultivate catfish spawning.

The enlargement system is a catfish farming system that aims to produce catfish ready for consumption. The main factor in this system is the selection of quality fish seeds with good durability and physical condition, so that good production results will be obtained. In addition, it is also necessary to pay attention to the problem of providing the main feed and the complementary feed so that the weight of the fish produced is as expected. While spawning cultivation is a cultivation business that aims to produce catfish seeds. Spawning is the process of releasing eggs by the female parent and sperm by the male parent, which is then followed by marriage. Spawning as a process of reproduction is a life cycle link that determines the survival of the species. The success of a fish spawning business is influenced by factors such as the maturity of the fish to be spawned, the food provided during maintenance, and environmental conditions (Laila, 2018).

This study aims to compare the cost structure, business income, and efficiency of catfish farming using an enlargement system. and the spawning system in the Bolopijah breeder group. In this study, R/C ratio analysis will also be used to see which system is more profitable and how efficient the system is. The aim is to provide the best solution for the Bolopijah Farmer Group in order to obtain the most profitable results.

LITERATURE REVIEW

Cost Structure and Revenue

Cost is the acquisition cost that is sacrificed or used in order to earn revenue and will be used as a reduction in income (Supriyono, 2011). Business costs can be classified into two, namely fixed costs and variable costs. Fixed costs(fixed costs)are costs that amount is fixed and are not affected by changes in production volume (Rahim and Hastuti, 2008). Fixed costs in catfish farming consist of land rental costs, tax costs, water costs, and equipment costs, and equipment depreciation costs. Variable costs (variable costs) are costs whose amount varies in proportion to changes in production volume. The variable costs in the catfish farming business consist of the cost of seeds, the cost of feed, the cost of disease-killing drugs, and the cost of labor. If you want high commodity production, production factors such as labor need to be added, seeds are also added, and so on so that the cost will change because it depends on the size of the desired production (Marthalia, 2018).

Income is the difference between total revenue and total expenditure. Revenue is the product of the total production amount and the unit selling price. Expenditures or business costs are all expenditures used in the form of value for the use of production facilities, wages, and others incurred during the production process. The total costs or expenses can be calculated by adding up the fixed costs and variable costs (Soekartawi, 2002).

ISSN 2807-5803 (online)

Analysis of R/C Ratio

R/C ratio is a value that shows the comparison between business revenues (Revenue = R) and total costs (Cost = C). Within the limits of the amount of R/C value, it can be known whether a business is profitable or not. If the result of the R/C ratio is more than one (R/C > 1), then the business is profitable, whereas if the result of the R/C Ratio is equal to one (R/C = 1), then the business is said to be breaking even or not experiencing profit and loss and if the result of the R/C Ratio is less than one (R/C < 1) then the business suffers a loss.

The value of the R/C Ratio cannot be negative because acceptance cannot be negative. So the value of the R/C ratio will always be positive even though later the revenue is not able to cover business costs. The value of the R/C ratio that is smaller than one means that the revenue is smaller than the cost. For example, the value of the R/C ratio is equal to 0.18; the meaning of this value is that every one rupiah of costs incurred will generate revenue of 0.18. This means that the R/C value equal to 1 means that the revenue received is only able to cover the costs incurred.

RESEARCH METHOD

This research was conducted at the Bolopijah Catfish Cultivator Group located in Randugowang Sariharjo Village, Ngaglik Sleman. The research method used is direct observation/survey to the field. The object studied in this study is the comparison of business efficiency and the comparison of the amount of income between catfish cultivators using a rearing and spawning system.

Calculation of the level of profit from catfish farming can be obtained by subtracting the costs incurred during the production process with revenues, namely:

$$I = TR - TC$$

where: I = Income (Rp); TR = Total Revenue / Total Revenue (Rp); TC = Total Cost / Total Cost (Rp).

Calculation of the total costs incurred by catfish farmers consists of fixed costs and variable costs. Fixed costs include pond maintenance costs and depreciation costs of ponds and aquaculture equipment. Variable costs include costs incurred by aquaculture entrepreneurs for the provision of seeds, feed, vitamins, and medicines. The formula used is as follows (Suparmoko, 2001): TC = TFC + TVC, where: TC = Total Cost / Total Cost (Rp); TFC = Total Fixed Costs / Total Fixed Costs (Rp); and TVC = Total Variable Cost / Total Variable Cost (Rp).

Gross revenue from catfish farming is the number of products produced in an aquaculture activity multiplied by the selling price prevailing in the market, with the formula (Siregar 2009): TR = Q x P; where:

TR = Total Revenue(Rp/year); Q = Quantity / Number of Production per year; P = Price / Price (Rp)

Data analysis was carried out using the R/C ratio analysis, namely the ratio of revenue to costs which showed the amount of additional revenue obtained from each rupiah spent in production. The greater the R/C, the better the cultivation business. To determine the success rate of cultivators, the following formula is used:

$$R/C \text{ ratio} = R/C$$

Where: R = Total revenue of cultivation business; C = Total cost of cultivation business.

FINDINGS AND DISCUSSION

Table 1 shows that the respondents were between 28 and 50 years old, where 19% of respondents were less than 31 years old, 62% were between 31 and 40 years old, and 19% were between 41 and 50 years old. This Ham shows that the majority of the farmers who are respondents are in adulthood. This research corroborates research conducted by Ajagbe (2019), Alawode and Jinaid (2014); Asa and Obinaju (2014); Akegbejo-Samsons and Adeoye (2012), and Awoyemi and Ajiboye (2011).

Table 1. Respondent Characteristics Aquaculture Catfish Farmers Bolopijah Group

Variable	Number (person)	Percentage (%)
Age:		
<31 years	5	19
31-40 years	16	62
41 - 50	5	19
years>50 years	0	0
Gender:		
Male	26	100
Female	0	
Education:		
Junior High School Senior High	0	0
School	18	69
D3/Bachelor	8	31
Length of business:		
<6 months	0	0
Six months – 1 year	21	81
>1 year	5	19

Table 1 shows that 100% of the respondents are male. According to Ajagbe (2019), male farmers participate more in catfish farming because pond management requires a lot of energy and special skills. In this case, the involvement of women in fish farming may be limited to product marketing. Alawode et al. (2016), Asa and Obinaju (2014), Adebayo and Daramola (2013), and Ideba et al. (2013) also confirmed the participation of more men than women in catfish farming.

In terms of education, 69% of respondents have high school education; and 31% have D3/Bachelor education. This shows that the farmers who are respondents have a fairly good formal education. From the length of the business, it appears that 81% of farmers have been doing the business between 6 months to a year, and 19% have been doing cultivation for more than one year. This shows that the breeders used as respondents are experienced enough in cultivating catfish.

Cost Analysis

Table 2 shows that the variable costs incurred in one period (3 months) in the catfish rearing system consist of 5 components, namely feed, seeds, labor, electricity, and harvest costs of IDR 7,000,000. Meanwhile, in the spawning system, there are seven components, namely feed, seeds, fertilizer, labor, electricity, harvest costs, and vitamins and drugs amounting to Rp. 6.040.000,-. For fixed costs incurred in the enlargement system is Rp. 2,000,000.- and the spawning system is Rp. 2,664,600,-.

ISSN 2807-5803 (online)

Table 2. Enlargement System Cost Analysis Catfish Cultivation

Cost	SYSTEM Enlargement				Spawning system			
	Unit (Unit)	**Unit Price**	**Age Economical**	**Total**	**Unit (Unit)**	**Unit Price**	**Age Economical**	**Total**
Fixed Costs								
Depreciation pool equipment	2 pieces of	Rp750.000	2 years	Rp750.000	2	300 .000	2-year	Rp300,000
land rental	1000 m^2	Rp5.000.000	1 year	Rp1,250,000	1	Rp1,600,000	3 years	Rp533.000
Depreciation of engine					1	Rp245.000	3 years	Rp81.600
Depreciation scales					1000 m^2	Rp5.000.000	1 year	Rp1.250.000
O2						IDR 500,000		IDR
500,000 TFC				**IDR 2,000,000**				**Rp2,664,600**
Variable Cost								
Feed	10 sacks	IDR 330,000		IDR 3,300,000	150 kg	IDR 5,000		Rp750.000
Seeds	5000 heads	Rp180		IDR 900,000IDR	20 pairs	100,000		Rp2,000,000
Fertilizer								Rp190,000
Labor	2 people	Rp1,000,000		IDR 2,000,000		IDR 190,000		IDR 2,000,000
Electricity	3 months	IDR 200,000		IDR 600,000	2 people	IDR 1,000,000		IDR 900,000
Cost of harvesting	1 time	IDR 150,000		IDR 100,000	3 months	IDR 300,000		100,000
Vitamins and medications				Rp100,000	1times	100,000		Rp100,000
TVC				**IDR 7,000,000**				**USD 6.04 million**
TOTAL COST				**Rp9.000.000**				**USD 8.7046 million**

Revenue Analysis

Analysis of income is used to determine the value of the income earned from the acceptance period. The revenue from the catfish rearing business carried out by the Bolopijah Farmer Group in one period is obtained from the sale of catfish ready for consumption in one period. The yield of farmers who use the enlargement cultivation system is 700 kg of catfish with a selling price of Rp. 17,000, - / kg. So that the revenue obtained during one period of enlargement is Rp. 11.900.000,-. For breeders who use the spawning cultivation system, 20 pairs of broodstock are prepared, yielding a yield of 50,000 heads with a selling price of Rp. 250 per head. So that the total revenue is Rp. 12,500,000,-

R/C Ratio

Analysis Analysis of the R/C ratio is used to find out how much additional revenue in one period is obtained by the Bolopijah Farmer Group as a benefit of every rupiah spent. The R/C ratio is calculated from the comparison between total income and total costs. The results of the R/C ratio analysis are shown in table 3.

Table 3. Ratio Analysis of the Catfish Cultivation and SpawningBolopijah Farmer Group

	System for the spawning	System Enlargement System
Total Revenue	Rp 12,500,000	Rp 11.900.000
Total Cost	Rp 8,704,600	Rp 9,000,000
Profit	Rp 3,795,400	Rp 2,900,000
R/C ratio	1,436	1,322

Table 3 shows that catfish farming with a spawning system provides a profit of Rp 3,795,400- with an R/ C Ratio of 1.436. While cultivation with the enlargement system obtained a profit of Rp. 2,900,000, - with an R/C ratio of 1.322. From these results, it appears that the R/C ratio value of the two cultivation systems shows the results of R/C > 1. This means that the catfish farming business using the spawning and rearing cultivation system is a fairly efficient business, where the rate of return received is still higher compared to the costs incurred.

Discussion

Based on the results of the R/C ratio analysis that has been carried out, the results show that the two catfish farming systems carried out by the Bolopijah Farmer Group show that the cultivation business with this system provides benefits for farmers. The income obtained by farmers in one harvest period is still greater than the costs that must be incurred. In the rearing system, the highest cost is incurred to buy feed for fish. While in the spawning system, the highest cost is spent on purchasing fish seeds.

In aquaculture with an enlargement system, farmers have to spend quite a lot of money to meet the needs of fish feed. Feed is the biggest cost component in catfish farming. There are many brands and varieties of feed on the market. A good catfish feed is a feed that offers aFood Conversion Ratio (FCR)is less than one. FCR is the ratio of the amount of feed to the growth of meat. The smaller the FCR value, the better the feed quality. In general, everyday catfish need to feed as much as 3 to 6% of their body weight with a frequency of 4-5 times a day. For small fish, the frequency should be more frequent because catfish have a cannibal nature, so they like to prey on the like when there is a lack of feed (alamtani.com, 2013) so that the cost of feed is the main cost in the enlargement system.

In the spawning system, the cost of purchasing seeds is the highest cost. The spawning system aims to produce catfish fry, while the rearing segment aims to produce catfish ready for consumption. From the spawning process, fish larvae will be produced, which must be raised in the next fish hatchery stage. Thus, it is necessary to select quality fish seeds, seeds that grow quickly and are resistant to disease. The selection of a good parent fish is a very important requirement in fish hatchery activities, and this is because the results of the selection are not good. The seeds that will be produced will also not be good. Spawning with poor parents allows the risk of growth of the resulting seeds to be slow and susceptible to disease, resulting in the quality of the seeds produced is far from standard.

From the results of the R/C ratio, it can be concluded that the spawning system and rearing system in the Bolopijah Farmer Group provide favorable results seen from the results of the R/C ratio, which is greater than 1. In this case, the spawning system has a better efficiency level than the enlargement system.

ISSN 2807-5803 (online)

This is indicated by the R/C ratio of the spawning system of 1.478, which is greater than the R/C ratio of the rearing system of 1.322. The R/C ratio in the spawning system is 1.478, which means that every rupiah spent will generate revenue of 1.478 Rupiah compared to the R/C ratio of the rearing system where 1 Rupiah expenditure will generate revenue of Rp. 1.322,-.

CONCLUSION

The results of the analysis of the cultivation system carried out by the Bolopijah farmer group showed that the largest cost incurred in the rearing system was the component of the cost of purchasing feed. The main goal in a fish rearing system is to prepare catfish that are ready to be consumed so that the need for feed will be very carefully considered. While in the spawning system, the highest cost is the cost of buying seeds. In accordance with the main purpose of the catfish spawning system is to produce quality seeds, so it takes the selection of broodstock fish that have good quality.

From the results of the R/C ratio analysis, the two systems show that there are advantages and that the cultivation business is feasible. However, the results of the analysis of the R/C ratio in the catfish spawning system showed that the R/C ratio value was greater than the value in the rearing system so that the spawning system was considered more profitable and had a better level of business efficiency.

FURTHER RESEARCH

Adding variables and ratios used can be from ratios other than those already used in this study to compare the results. Company managers can use a prediction model produced to estimate the company's condition, so You can make efforts. Management improvements to prevent in the direction of difficulty worse finances.

REFERENCES

Adebayo, OO and Daramola, OA (2013). Economic analysis of catfish (Clarias gariepinus) production in Ibadan metropolis. Discourse Journal of Agriculture and Food Sciences, 1(7): 128-134

Ajagbe, SO (2018). Analysis of small-scale catfish production in Ibadan Metropolis, Oyo State. Nigeria, A B.Sc. project submitted to Department of Agricultural Economics, University of Ibadan, Ibadan. Pp 124

Ajagbe, SO (2019). Analysis of Profitability catfish production in Ibadan Metropolis, Oyo State. Nigeria, Journal of Forestry Research and Management. Vol. 16(3).50-57; 2019, ISSN 0189-8418

Akegbejo-Samsons, Y. and Adeoye, D. (2012). Measuring Profitability in Small Scale Aquaculture Enterprises in South West Nigeria. IIFET 2012 Tanzania Proceedings

Alawode OO and Jinad, AO (2014). Evaluation of Technical Efficiency of Catfish Production in Oyo State: A Case Study of Ibadan Metropolis. Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS) 5(2): 223-231.

Asa UA and Obinaju, LC (2014). Economics of Catfish Production in Akwa Ibom State, Nigeria. Global Journal of Management and Business Research: Economics and Commerce 14(3): 22-28.

Engle, CR (2010). Aquaculture Economics and Financing: Management and Analysis. Wiley-Blackwell. 2121 State Avenue, Ames, Iowa 50014–8300, USA Pp. 274. www.wiley.com/wiley-blackwell

Engle. CR (2012). Introduction to Financial Management of Aquaculture Businesses. Southern Regional Aquaculture Center SRAC Publication No. 4400

Engle, CR and Stone, NM, (2014). Costs of Small-Scale Catfish Production for Direct Sales. Southern Regional Aquaculture Center, SRAC Publication No. 1800, Revision

Ideba EE, Otu WI, Essien AA, Iniobong EO, and Ekaette SU (2013). Economic Analysis of Fish Farming in Calabar, Cross River State, Nigeria

Issa, FO, Abdulazeez, MO, Kezi, DM, Dare, JS, and Umar R. (2014). Profitability analysis of small-scale catfish farming in Kaduna State, Nigeria. Journal of Agricultural Extension and Rural Development, 6(8):347 – 353

Marthalia, 2018, Analysis of Cost Structure, Income, and Risk of Purple Eggplant (Solanum Melongena L.) Farming in Simpang Kanan Village, Sumberejo District, Tanggamus Regency, Faculty of Agriculture, University of Lampung Bandar Lampung

Mohammed, US, Iyiola AS and Usman, RK (2015). Production Analysis of Catfish Farming In Epe Local Government Area of Lagos State, Nigeria. Production, Agriculture and Technology (PAT) 11(2): 153-161.

Pappas, JL, Hirschey, M., 2005, Managerial Economics, Translation of Daniel Wirajaya. Character Building. Jakarta.

Rochman, A., et al, 2014, Analysis of Dumbo Catfish (Clarias Gariephinus) Cultivation Business In Wonosari Village, Bonang District, Demak Regency, Mediagro, Vol 10, No. 2, pp 57 -68

Salvatore, D., 2005, Managerial Economics in the Global Economy, Fifth Edition, Salemba Empat, Jakarta

Tunde, AB, Kuton, MP, Oladipo, AAand Olasunkanmi, LH (2015). Economic Analyze of Costs and Return of Fish Farming in Saki-East Local Government Area of Oyo State, Nigeria. Journal of Aquaculture Research Development, 6(2): 306-311.

 ISSN 2807-5803 (online)