Analysis of Production and Business Income of Gouramy (*Osphronemus gouramy*) Hatchery in Fifty Cities District West Sumatra Province

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**Abstract.** The research was carried out in Lima Pulu kota, West Sumatra Province, during March 2018. The purpose of this study was to analyze the efficiency use level of production factors, gouramy hatchery business farmer income, analysis of the BEP value of revenue, production and prices. The method used in this study was a survey method with a total sample of 36 farmers from a total of 126 farmers. Taking respondents using stratified random sampling. Data analysis uses VPM / MFC ratio analysis, income analysis, and BEP analysis. The results showed that the use of urea fertilizer and feed production factors had exceeded the optimal conditions (efficiency value <1), while the production factors of the number of mother fish, manure, lime and labor were not optimal (efficiency value > 1). The average income is IDR 80,293,650 per year. The average BEP value of IDR 17,204,069, BEP production 9,271 tails, and BEP price of IDR 491, - / tail.

1. Introduction  
Kissing gouramy (*Osphronemus gouramy*) is a type of freshwater fish that has a high economical value. This fish is one type of fish cultivated to increase the income of fish farmers in Indonesia. The demand for carp every year has increased this can be seen from the production that is constantly increasing. In 2012 carp production of 84,681 tonnes and in 2016 to 149,553 tons [1].  
The success of the fish enlargement effort is very dependent on the availability of seeds both reviewed in terms of quantity, quality, and quantity [2]. Increasing demand for carp seeds shows the effort of carp hatchery is quite promising. But the problem of improvement also arises a lot such as high mortality rate, low fecundity eggs, low degree of fertilization and hatching of eggs, and varying the size of seed on the maintenance of the pond [3].  
Fifty cities is the largest producer of Gurame fish seed in West Sumatera. Production of carp seed in the year 2017 reaches 5 billion tails [4].  
Further expressed the amount and income of carp hatchery each year increased based on the condition of the study aims to know how the level of efficiency of use of production factors, the income of farmers, and the breakeven business of Carp Hatchery.

2. Methodology  
The research was held in March 2018 at the Nagari Mungo District of Luhak District fifty cities. The location is purposive determined with consideration of the area is a nursery center of Gouramy Fish. The method used in this research is the survey method. Sampling is done stratified random sampling, the number of samples taken as much as 36 of the 126.
The data analysis used in this research is:

1. For efficiency of production factor used VPM analysis (Value Production Marginal) by comparing VPM value of production factor with the price of production factor caused. The formula is:

\[ Ef = \frac{\text{VPM}_{xi}}{\text{P}_{xi}} = 1 \]

Description:
- \( Ef \) = Production Efficiency Index
- \( \text{VPM}_{xi} \) = the value of Marginal production because it uses \( Xi \)
- \( \text{P}_{xi} \) = Price of the production factor

To find \( Xi \) is:
- \( Xi = \frac{Bi \times Y}{X \times \text{P}_{yi}} \)

Where:
- \( Bi \) = elasticity of the production factor to-I
- \( Xi \) = number of production factors to-I
- \( \text{P}_{xi} \) = \( X \) production factor price
- \( PY \) = Product Price \( Y \)
- \( Y \) = number of products obtained [5].

2. 2. Revenue Analysis

A. Total Admission

\[ TR = Y \times \text{Py} \]

Where:
- \( TR \) = Total Receipts
- \( \text{Py} \) = fish seed Price Per tail
- \( Y \) = fish Seed Production

B. Income (PD)

\[ Pd = TR - TC \]

Where:
- \( Pd \) = Revenue
- \( TR \) = Total Revenue
- \( TC \) = Total Cost (total cost) [6],[7].

3. To find out breakeven used formulations:

- BEP acceptance = \( \frac{\text{FC}}{1-V C/S} \)
- Production BEP = \( \frac{\text{FC}}{\text{P} - \text{AVC}} \)
- BEP Price = \( \frac{\text{TC}}{Y} \)

Where:
- \( \text{FC} \) = Total Fixed Cost
- \( \text{P} \) = selling price/unit (RP/tail)
- \( VC \) = variable/unit Co st
- \( S \) = Revenue (RP)
- \( \text{AVC} \) = Variable cost per unit (RP/tail)
- \( TC \) = Total Cost (Rp)
- \( Y \) = Total production (tail) [8].

3. Result and Discussion.

According to table 4.5 obtained VPM and MFC ratios for the parent production factor, manure, lime and manpower valued at > 1, meaning the use of production inputs is not optimal, the use of production inputs has not been efficient because it is still below average. In contrast, the production factor of urea feed and fertilizer exceeds the average value. The number of seeds produced is influenced by internal factors such as parent quality, heredity, age, reproduction and resistance to disease. External factors include the
quality of water associated with the provision of manure, urea and lime fertilizer, solid distribution, and the quality of feed [9].

Table 1. NPM/BKM value and ratio of Gurami Fish hatchery year 2018 in Nagari Mungo District of Fifty cities

| Production factors | Average production factor | VPM | MFC | VPM/MFC | Optimal input usage |
|--------------------|---------------------------|-----|-----|---------|---------------------|
| Constant           | 259.96                    | 384.902.946, 47 | 100.00 | 3.849,03 | 162.506,02 |
| Parent number (tail) | 42.22                    | 427.76 | 47 | 250 | 47,40 | 395,09 |
| Fertilizer (Kg/m²)  | 836.67                    | 2,60 | 118.510,16 | 1500 | -283,22 | -11.903,53 |
| Urea(Kg/m²)         | 42.03                     | -0.47 | -424.822,74 | 13.342.649,1 | 7 | 1.779,02 |
| Feed (Kg/m²)        | 72.03                     | -25,30 | - | 7500 | - | -364.855,96 |
| Lime (Kg/m²)        | 291.94                    | 3.65 | 474.712,34 | 600 | 791,18 | 231,11 |
| Labour (HOK)        | 291.11                    | 17,20 | 2.224.217,07 | 7.000 | 317,74 | 93,35 |

Source: Primary Data, 2018

3.1. Admission Gurami Fish Hatchery
Based on the results of the study, seeds of the cultivated gurami fish have an average harvest period of three to four months. In one year the average Fertilmaker performs the harvest twice.

The seeds are marketed mostly 4-6 cm in size with an average price of 2,200 IDR/tail. The amount of seed sold ranges from 11,000 to 90,000 with an average of 52,154 tails per farmer. Furthermore [10] expressed the seeds of gurame marketed in BBI Ngoro Jombang size above 3cm with a price of 1500 IDR/tail.

Each parent gurame can isolate the larvae of 3,185 with spawning frequencies 40 days. According to the description of Cultivdidaya in this area the number of larvae each parent averages as much as 1000 tails/parent with a spawning of 3-4 times per year. Based on this, it can be said the business production of carp hatchery in this area is not maximized.

3.2. The incomes of Gurami fish Hatchery
The small amount of farmers' income was influenced by the number of seeds sold. This means that the higher the mortality will be the lower the income received by farmers and vice versa,[11] stated for the one-tails of carp, which has 3,185 larvae and the average research area of each parent larva produces 1000 larvae.

The average revenue of farmers annually is Rp. 114.738.800 and costs incurred by farmers Rp. 34,455,150. Each farmer's net income annually amounted to Rp. 80,293,650.

The cost of fish-based carp hatchings consist of fixed costs and unfixed costs. The fixed costs consist of land rental costs, parent purchases, equipment, earth tax building and depreciation fees. While the cost does not remain consist of purchasing costs of manure, urea, lime, feed, and labor. The
average fixed cost incurred by the Carp hatchings is Rp 16,687,947 per year. The average of the fixed costs incurred by the fish is Rp 1,974,264 per year (table 2).

[12], production costs can be differentiated into fixed costs and unfixed costs. [13] Production costs are all costs incurred for the production process. Production costs incurred by each cultivation vary according to the land area and the amount of use of production inputs. Where the production cost for each of the spawning is 29,565,000 (table production inputs. Where the production cost for each of the spawning is 29,565,000(table).

**Table 2. Uraiyan Carp Hatchery cost 2018 year in Nagari Mungo district of fifty cities.**

| No | Description       | Physical | Unit | Rating (IDR) | Value/year (IDR) |
|----|-------------------|----------|------|--------------|------------------|
| 1  | Rent land         | 0.82     | Ha   | 24,600,000   | 24,600,000       |
| 2  | Parent purchase   | 40       | Tail | 2,000,000    | 4,000,000        |
| 3  | Equipment         | -        | -    | 350,000      | 700,000          |
| 4  | Building tax      | -        | -    | 85,000       | 85,000           |
| 5  | Labor cost        | 22       | HOK  | 1,540,000    | 3,080,000        |
| 6  | Manure            | 800      | Kg   | 200,000      | 400,000          |
| 7  | Purchase Urea     | 40       | Kg   | 100,000      | 200,000          |
| 8  | Purchase Feed     | 72       | Kg   | 540,000      | 1,080,000        |
| 9  | Purchase Lime     | 250      | Kg   | 150,000      | 300,000          |
|    | **Total**         |          |      | **29,565,000** | **34,445,000**   |
3.3. Break Even Point (BEP)
BEP is the breakeven point of the balance between total and total cost, meaning that the total acceptance is equal to the total cost incurred [14]. Furthermore, according to [15] stated that BEP analysis can be used as a tool to analyze the production level so that entrepreneurs do not lose and have to produce on the Lid. Calculation result obtained BEP admission Rp.14,841,000, while the production BEP (tail) is 17,400. BEP Price is Rp. 660 per tail. Based on this can be said the value of acceptance, production and the price of fish hatchery is far above BEP value.

4. Conclusion and Suggestion
4.1 Conclusion
Based on the analysis and discussion obtained several conclusions as follows:
1. The use of the production factor of urea and feed fertilizer has waved beyond optimal conditions while other production factors such as the number of parent, manure, lime and labor use is still below average.
2. The financing income amounted to Rp 80,293,650 per year.
3. BEP value of acceptance, production, and price far below the actual value.

4.2 Remark
The ineffectiveness of this production factor is due to the fact that the community does not fully understand about carp hatchery so that training and counseling are needed to all components of society who are directly involved in carp hatchery. so that people can understand and understand about carp hatchery

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