

BUSINESS PROSPECT OF THE TILAPIA HATCHERIES BY STANDARD OPERATING PROCEDURE APPLICATION OF GOOD HATCHERY PRACTICES (GHP) IN BANJAR REGENCY SOUTH KALIMANTAN

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ABSTRACT

This research aimed to (1) analyze the profit of the tilapia hatchery business in Banjar Regency with GHP application and comparing it with the profit before it applied GHP; and (2) to analyze the investment feasibility of the tilapia hatchery business with GHP application in Banjar Regency. This research was carried out in the Karang Intan District, Banjar Regency, South Kalimantan, with the community GHP certified hatchery units as the object. The collected data was the data that directly originated from observation results in the location of the research, and other supporting data, which related to the object of the research. The results of the research showed that by applying GHP, the tilapia hatchery business gave more profit than before applying it. By applying GHP, the tilapia hatchery business developed very profitably and feasible to be carried on. The result of investment feasibility analysis showed that the *NPV* was positive, the *Net BCR* was more than 1, the *IRR* was more than discounted rate, and the period of the return of investment was faster than the project period.

Keywords: the tilapia hatchery businesses, GHP, investment feasibility

INTRODUCTION

Along with the growth of aquaculture business, especially the enlargement of tilapia fish, surely it must also be accompanied by the supply of seeds which satisfy the demand of tilapia fish business entrepreneurs. The seed supply generally comes from the community hatchery units in Banjar and Banjarbaru districts, as well as from government-owned hatchery units such as the Freshwater Aquaculture Center (Balai Perikanan Budidaya Air Tawar – BPBAT) Mandiangin and fish hatchery centers owned by the provincial and

district/city governments. In fact, these local tilapia hatchery units tend to be overwhelmed by the demand, so that over time, the hatchery business entrepreneurs, especially the community hatchery units, are no longer paying attention to the quality of the seeds produced, but the preferred quantity in their production.

Directorate General of Aquaculture Fisheries (2013) argued so that aquaculture can take place throughout the year with maximum production, the continuity of fish seeds in both quantity and quality is required. It is also argued that the development of international issues in recent years poses multi-dimensional challenges that must be faced in the development of aquaculture business, one of which is the demand to carry out responsible and sustainable aquaculture.

To carry out sustainable aquaculture business activities, the application of responsible aquaculture procedures should start from the hatchery activities to the enlargement activities. In this case, in addition to sufficient quantities, the seed quality is also one of the critical determinants of successful cultivation. To produce qualified and decent seed, the hatchery business should apply seeding techniques in accordance with the standards and procedures of good hatchery, the Good Hatchery Practices (GHP).

Based on the description, the purposes of this research activity are:

1. Analyzing the profit of tilapia hatchery business that applied GHP in Banjar Regency and compares it with its profit before applying GHP.
2. Analyzing the feasibility of tilapia hatchery business investment that implements GHP in Banjar Regency.

MATERIALS AND METHODS

This research activity was carried out in the Karang Intan district, Banjar Regency, with the consideration that the community GHP

certified hatchery units is only in the district. The data collected was the data that sourced directly from the business entrepreneurs of GHP certified tilapia fish hatchery, through interview techniques. Data analysis includes the profit analysis of tilapia fish hatchery business before and after applying GHP using the formula of business profit (Soekartrawi, 1995), and investment feasibility analysis of tilapia fish hatchery business includes *Net Present Value (NPV)*, *Net Benefit Cost Ratio (Net BCR)*, *Internal Rate of Return (IRR)* dan *Payback Period* analysis (Gittinger, 1982).

RESULTS AND DISCUSSION

Profits of GHP Tilapia Hatchery Business

GHP applied tilapia fish hatcheries carried out by fish farmers initially invested IDR 99,625,000 on average, including Mandiangin brood fish strain (F2) the with the average of 30 packages (400 fishes/packs with a weight between 150-250 g/fish) or an average of about 2,400 kg with a value of IDR 84,000,000. Optimal results can be obtained from the breeder with spawning period within three years, after three years, it can be classified as rejects and can be sold for IDR 25,000/kg. Other investment components include feed warehouse/equipment, hapa (cages), oxygen

tube, strainers, fishnets, and bucket, with a total investment value of IDR 15,625,000. Based on the economic life of each investment component, the depreciation value equal to IDR 7,852,500/year.

In conducting the business, the tilapia farmers enter the input of production, such as feeds, lime, fertilizers, oxygen, plastic packagings and labor, as well as fixed costs, which include ponds rental, electricity cost, and capital cost (depreciation) cost, or so-called production cost with an average of IDR 288,422,500/year.

The average production of tilapia seed is 3,000,000 fishes/year with size 5 - 8 cm, with the unit price of IDR 180/fish; it obtained the production value with the average of IDR 540,000,000/year. After deducting the total average production cost of IDR 288,422,500/year, the average profit is IDR 251,577,500/year or it can reach an average profit of IDR 20,964,800 in a month. Details on the cost and the value of the production, as well as the profit of the tilapia hatchery business with the application of GHP, can be seen in Table 1.

The profit value is achieved after applying the standard GHP operational procedures which, when compared to the profit before applying GHP is as in Table 2.

Table 1. Cost and production value of tilapia hatchery business using GHP

Description	Volume	Unit Price (IDR)	Total (IDR)
Operational Cost			
Feed	15,000 kg	8,500	127,500,000
Lime	4,500 kg	1,000	4,500,000
Fertilizer	4,050 kg	800	3,240,000
O ₂ Refill	19 times	165,000	3,135,000
Plastic Packaging	19 rolls	75,000	1,425,000
Labor	480 days work	50,000	24,000,000
Fixed Cost			
Ponds rental	36 unit	4.000.0000	142,000,000
Electricity	12 months	22,500	270,000
Depreciation			3,102,500
Total			309,172,500
Production			
Seed (5 - 8 cm)	3.000.0000 fishes	180	540,000,000
Profit			230,827,500

Source: Results of data processing (2017)

Table 2. Comparison of tilapia hatchery business profit after and before applying GHP

Description	After GHP	Before GHP
Superior broodfish	yes	no
Activity documentation	yes	no
Average production capacity/year (fish)	3,000,000	1,675,000
Seeds sale price (IDR/fish)	180	150 - 160
Average production cost/year (IDR)	309,172,500	240,422,500
Average production value/year (IDR)	540,000,000	268,000,000
Average profit/year (IDR)	251,557,500	27,577,500

Source: Results of data processing (2017)

In the implementation of GHP in fish hatchery business, there is a necessity to use a superior broodfish and to document every business activity. As a result of the existence of these requirements, the results are very clear, especially in terms of production capacity, product selling price and allocated production cost. The production capacity of seeds produced after applying GHP is much greater than production capacity before applying GHP. Another impact is the selling price of the product also increased from the previous, which ranged from IDR 150 - 160/fish to IDR 180/fish, this is because the resulting product tends to be more uniform in size. So although in terms of production costs that before implementing GHP is smaller than that after implementing GHP, but the business profits are much larger that after applying the GHP.

Increased production capacity is possible because by using a superior broodfish, the average production of seeds produced at each spawning is at least 500 seeds with the size of 5 - 8 cm for each female broodfish, so that in five broodfish packs with 1,000 female broodfishes, they can produce at least 500,000 seeds. If each of the broodfish can be breed six times a year, the total production of seeds that can be produced averagely 3,000,000 seeds/year. The resulting seeds are entirely absorbed mostly by the floating net cages (Keramba Jaring Apung - KJA) farmers in Karang Intan and Aranio districts, Banjar Regency, and also farmers from Central Kalimantan. The farmers are already the customers and do not even want to switch to other community hatchery units (Unit Pembenuhan Rakyat – UPR) even though they have to wait until the seed stock meets the ordered amount, due to the quality of the seed that is evenly distributed and lower mortality rate.

In contrast, the average seed production prior to applying the GHP was 279 fishes/broodfish, thus assuming the same number of broodfishes and breeding periods of

seeds then yielded an average of 1,675,000 fishes/year. This is because the broodfish that were used comes from the local broodfish candidate marked with a clear track record of the generation. The seeds produced also tend to be less uniform and smaller so that the price is lower and based on information from tilapia KJA farmers who use the non-superior seeds, the mortality rate of the seeds can reach more than 50%.

Business Feasibility of Tilapia Fishing with GHP

Based on the results of benefit analysis, preliminary information related to the projection analysis of the feasibility of tilapia fish hatchery business with the application of GHP are as follows:

1. Investment invested at the beginning of the business includes the broodfishes, feed warehouse/equipment, hapas, oxygen tube, strainers, fishnets, and bucket.
2. The ponds are calculated as rent for IDR 4,000,000/pond.
3. Electricity in the form of lighting lamp allocated for IDR 20,000/month.
4. Commercial feeds at IDR 8,500/kg.
5. Agriculture lime at IDR 1,000/kg.
6. Manure at IDR 800/kg.
7. Oxygen tube refill at IDR 165,000/filling.
8. Plastic packaging at IDR 75,000/roll.
9. Labor for IDR 50,000/days work

The feasibility test of Tilapia hatchery business in Banjar Regency is done through investment analysis by calculating Net Present Value (NPV), Net Benefit Cost Ratio (NetBCR), Internal Rate of Return (IRR) and Payback Period (PP), with 14% discount based on effective interest rate for microcredit program (Regulation of the Minister of Finance No.22/PMK.05/2010 on Second Amendment to Regulation of the Minister of Finance No.135/PMK.05/2008 concerning Credit Facility for Microcredit Program). In its calculations, the feasibility of this business is analyzed based on physical projection per year as follows:

1. 35 units of ponds for broodfish ponds and nursery ponds.
 2. 300 sacks of commercial feed @ 50 kg (15,000 kg).
 3. 4500 kg of agriculture lime.
 4. 4,000 kg of manure.
 5. 20 times oxygen tube refills
 6. 20 rolls plastic packaging.
 7. 480 days work of labor
 8. 3,000,000 tilapia seeds (5 - 8 cm) production.
 9. This tilapia hatchery business is projected for three years in accordance with the optimal period of tilapia broodfish spawning.
- The feasibility projection of this hatchery business in detail can be seen in Table 3.

Table 3. The feasibility of tilapia hatchery business with GHP

Description	Year			
	0 (IDR)	1 (IDR)	2 (IDR)	3 (IDR)
Investment				
Broodfish (2,000 fishes, 150 - 250 g/fish)	25,000,000			
Feed warehouse/Equipment (1 unit)	15,000,000			
Hapa (2 units)	1,500,000			
O ₂ tube (1 unit)	1,100,000			
Strainer (3 units)	225,000			225,000
Fish Net (2 units)	120,000			
Bucket (4 units)	180,000			180,000
Operational				
Pond rental (35 units)		140,000,000	140,000,000	14,000,000
Electricity (IDR 25,000/month)		300,000	300,000	300,000
Feed (15,000 kg @ IDR 8,500)		127,500,000	127,500,000	127,500,000
Lime (4,500 kg @ IDR 1,000)		4,500,000	4,500,000	4,500,000
Manure (4.000 kg @ IDR 800)		3,200,000	3,200,000	3,200,000
O ₂ Refill (20 x IDR 165,000)		3,300,000	3,300,000	3,300,000
Plastik Packaging (20 rolls @ IDR 75.000)		1,500,000	1,500,000	1,500,000
Labor (480 days work @ IDR 50.000)		24,000,000	24,000,000	24,000,000
Cash Outflow	43,125,000	304,300,000	304,300,000	304,705,000
Income				
Seeds 5 - 8 cm @ IDR 160/fish	0	480,000,000	480,000,000	480,000,000
Broodfish reject @ IDR 25.000/kg	0	0	0	66,000,000
Cash Inflow	0	480,000,000	480,000,000	546,000,000
Surplus (Depisit)	-43,125,000	175,700,000	175,700,000	241,295,000
Total Surplus	549,570,000			
Discount Factor (14%)	1.00	0.88	0.77	0.67
NPV_i 14%	-43,125,000	154,122,807	135,195,445	162,867,252
NPV	409,060,504			
NetBCR	10.49			
IRR	409%			
PP (tahun)	0.25			

Source: Results of data processing (2017)

The feasibility analysis of the GHP applied tilapia hatchery business resulted in a positive *NPV* number, which means that the business is feasible to work on. This is supported by a *Net BCR* value of more than 1 (5,76), which means the business is indeed profitable, and the *IRR* value is 231%, which is much larger than the prevailing interest rate (14%), which means that the return on investment capital during the projection period is considered feasible as long as the interest rate is still below 409%. Similarly, the value of *PP* is 0.25; which means that the payback

period for the investment of this tilapia hatchery business is less than a year or about three months faster than the projection period (3 years), so this business is very feasible.

This projection result was obtained from the use of broodfish as much as five packets or 2,000 fishes, which consists of 1,000 male broodfishes and 1,000 female broodfishes. The projected production capacity was a minimum average production capacity of 500 seeds of 5 - 8 cm per female. Optimally, a superior female tilapia can produce an average of 1,500 larvae in one spawning. If the mortality reaches 30 -

50% during breeding until the size of 5 - 8 cm, then the optimal seeds that can be produced are as much as 750-1000 fishes. As for the production cost, the projected input price was the maximum input price applicable at the time of the research. For the price of seeds, the projected price was the price generally applicable in the hatchery units, which was IDR 160/fish. Thus, it is very clear that by applying GHP, the tilapia business is very feasible to be carried on.

In fact, there are only two GHP certified UPR units. Several things that underlie why other UPRs are reluctant to apply GHP, among others:

1. The requirements of the GHP that require the use of a superior brood fish with clear origin information, as well as the necessity to pull out broodfishes that were used previously, causing most UPRs reluctant to do so.
2. The requirement of documentation of hatchery business activities, including standard operating procedures, forms, and records. Whereas with the documentation, information about the production process will be easily accessed and traced.
3. Biosecurity requirements such as the condition of the ponds that must be clean, the source of water that should be feasible for fish farming activities with separate construction of the input and output of water pipes and the need to not contaminate between pond plots, would be quite burdensome for most UPRs that still use the makeshift ponds construction. In this case, what is meant by biosecurity is a safeguard of the farm system from the contamination of pathogens (disease-causing organisms) from outside and prevent the development of pathogens to farm environment, covering arrangement of layout and/or construction of the ponds; setting of location access; containers, equipments and rooms sterilization, and hatchery environmental sanitation.
4. Lack of socialization or information related to the application of GHP, especially with regard to business analysis, so that the results of this study are expected to be an input material for all stakeholders, both from the government and the main actors/UPRs.

CONCLUSIONS

1. By applying GHP, tilapia hatchery business gives bigger profit compared to that achieved before applying it.

2. By applying GHP, tilapia hatchery business developed very profitably and feasible to be carried on. The result of investment feasibility analysis shows positive *NPV* value, with *Net BCR* value more than 1, *IRR* more than discounted rate, and payback period faster than projection period.

REFERENCES

- Directorate General of Aquaculture Fisheries (2013). Good Fish Hatchery Guidelines (GHP). Directorate General of Aquaculture. Jakarta.
- Gittinger, J.P. (1982). Economic Analysis of Agricultural Project. John Hopkins University Press. Baltimore.
- Soekartawi (1995). Farming Analysis. UI-Press. Jakarta.