



Improvement of Catfish (*Claris sp.*) Production on Limited Land in Bukit Dempo Village, Belinyu

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Abstract

The potential of freshwater fisheries in Bangka Regency, Bangka Belitung Province, is sufficient to support fisheries activities in this area. An activity that is quite prominent is catfish farming using swamps and tarpaulin ponds on limited land. In this study, the analysis of cultivation activities was carried out on the Bukit Dempo community group who became partners in the national community service activities, in cooperation with Universitas Airlangga and Bangka Belitung University. Characteristics of the pond using a combination of fixed nets with a net diameter of 0.5 cm. In the pond also found water plants in the form of water hyacinth which is expected to be able to make a symbiotic use of the organic material that has been left behind from feed and catfish waste. The cultivation system is classified as semi-intensive with a combination of commercial feed with high protein (31-33%). The main problem in this cultivation system is low productivity and the lack of technology applied in an effort to increase production efficiency. Furthermore, high production yields are marketed to Pangkal Pinang City and also to local areas around the Belinyu sub-district. Technical constraints include Motile Aeromonas Septicemia (MAS) due to the bacterium *Aeromonas hydrophila*, which causes about 10% of mortality in commodities before harvest. There has been no treatment action in overcoming the disease, so it is necessary to be careful in avoiding death due to disease by observing catfish at the change of seasons.

INTRODUCTION

Geographically, the Province of Bangka Belitung Islands is located at coordinates 105° – 108° East Longitude

and 03°30" South Latitude. This province has a total area of 81,582 Km² covering the two Big Islands of Bangka and Belitung

Island, with a total land area of 16,281 Km². Apart from the two large islands in this province, there are still 251 small islands scattered throughout the province with a total sea area of 65,301 km² with a coastline of 1,200 km². This opportunity shows that the condition of marine waters is extraordinary. However, the potential for freshwater resources is also required for management because it can supply income from the aquaculture sector at 1,316,000/year or with a conversion value of 17,160 billion rupiahs/year. Although it is not comparable to the mining and capture fisheries sector in this area, the potential for aquaculture can still be developed, assuming that the potential resources supported by the community continue to increase.

The fisheries sector is expected to be able to become the locomotive and prime mover for accelerating national and regional economic development based on local resource potential. Cultivation fisheries have become one of the pillars in efforts to improve the economic level of the surrounding community, especially in the regions. Although the Province of Bangka Belitung Islands, especially the Bangka Regency, has the potential for extensive marine resources, the cultivation sector is more promising to increase the region's economy. The aquaculture sector is a significant potential considering that the topography of this district not only has coastal resources, but the stretching of freshwater fishery activities is quite calculated.

Aquaculture activity which is quite potential is marine cultivation which has utilized about 6.2 ha (0.005%), while brackish water cultivation/ponds have only reached 250 ha (0.103%). In the freshwater aquaculture sector, activities in this province have utilized around 33 ha (2.0%) which allows development and intensification of activities. Based on existing statistical data, freshwater aquaculture activities are capable of producing 120.5 tons of fish with a conversion value of 5.11 billion rupiahs/

year. One of the cultivation activities developed in Bangka is catfish cultivation. The cultivation of catfish and other types of freshwater fish is being developed in ponds that are quite potential in Bangka Belitung (Bidayani, 2018). Mainstay commodities in aquaculture development in Bangka district include catfish, tilapia, catfish and carp. Catfish is a fish that is easy to cultivate with a high enough level of community acceptance of this commodity.

In this community service activity report, we describe the cultivation activities that have been carried out by the community in Bukit Dempo Village, Bukit Dempo Environment, Belinyu District. The area of these villages reaches 52.57 km² with a population of about 3,799 people. Location of catfish farming activities developed by the Dempo Jaya Sejahtera community group chaired by Mr. M.A. Hari Fitriyanto runs this business with three employees. Catfish cultivation which has been initiated in 2018, includes two activities, namely hatchery and catfish enlargement. Catfish hatcheries start from the maintenance of the broodstock to produce ready-to-sell seeds with a size range of 3-4 cm which is then sold to cultivators around Belinyu District and Bangka Regency. Meanwhile, the rearing activity produces 125 grams of ready-to-eat fish (which means 7-8 fish per kg of catfish). The location for marketing the catfish harvest includes. It is hoped that the socialization and extension activities in cultivation activities can increase the yield and volume of catfish production in this region.

In this activity, the technology that is expected to be applied to support the production of catfish farming in this area is the use of probiotics. The use of this probiotic not only adds good bacteria but also adds a number of ingredients that can increase the immune system in fish to make them more resistant to disease. The utilization of probiotics is also expected to increase feed efficiency and also overcome

MAS disease that often occurs in this type of fish activity.

METHODOLOGY

Place and Time

This community service activity was carried out from July-September 2020 in Bukit Dempo Village, Belinyu District, Bangka Regency, Bangka Belitung Province. This activity is in partnership with the community group *Dempo Jaya Sejahtera* and the Department of Aquaculture, Faculty of Agriculture, Fisheries and Biology, Bangka Belitung University. Apart from extension activities, another activity is training on the use of probiotics in catfish farming, which is currently not widely used. The application of probiotics has been widely used in efforts to improve water quality and increase efficiency in cultivation activities. However, the use of this material has never been applied and tends not to be given. Therefore, this socialization activity also provides an overview of the benefits and technical experience in providing self-propagated probiotics without having to buy commercial products continuously.

Research Design

The method used in writing this article is observational research and is descriptive in nature. This method is carried out by describing the catfish farming activities carried out in the study

area and providing direction and input according to the current development of catfish farming which has been applied in other regions in Indonesia.

Data Analysis

We used the SWOT analysis to analyze the constraints and problems found during cultivation activities. Information in preparing the SWOT analysis was obtained by conducting interviews with several business actors in discussion sessions during outreach. The SWOT analysis is carried out by conducting a comparative study of internal and external factors.

RESULTS AND DISCUSSION

The cultivation system in Dempo Village, Belinyu District is carried out in freshwater swamps with the primary source of freshwater being rainfed. This condition is because not all areas in this area are flowed by rivers. The river conditions are polluted by tin mining which makes the development of freshwater cultivation in this area quite heavy. Cultivation activities are carried out in ex-mining ponds (more than ten years) (Bidayani, 2018), tarpaulin ponds (Rosalina, 2014; Supratman and Umroh, 2016), or peat swamps which are safer against the potential contamination of tin mining waste in this archipelago province.



Figure 1. Dempo Maju Sejahtera catfish rearing pond.

The number of pools owned is three main pools of several sizes. There is one large pool measuring 20 x 10 meters, and the rest measuring 6 x 10 meters, and 15 x 15 meters. In these earthen ponds, maintenance is carried out in cages (fixed nets) with the diameter of the cages being 6x6 meters (6 pieces), 2 x 4 meters (5 pieces), and 2 x 3 meters (10 pieces). Apart from soil ponds, traditional community hatchery activities are also carried out by maintaining catfish seeds in a tarpaulin pond with a size of 2 x 3 meters.

This hatchery activity has also been developed by the Dempo Maju Sejahtera community group to meet the needs of its members and communities around the Bukit Dempo Village. Hatchery and spawning techniques are carried out naturally, without the hormonal induction of both male and female fish. Then the zygote will develop into catfish larvae in larval rearing tanks for a few days. Kakaban, where catfish eggs are attached is added in the form of palm fiber, and after the fish larvae start swimming, the maintenance pond is cleaned of fibers and the remaining eggs that have not hatched. The feed is a mixture of commercial feed with flour and egg yolk which is then in the form of a paste. The fish feed paste is distributed in larval rearing with an immeasurable amount of feed, based only on approx. Every 2-3 days, do a water change to remove food waste and possibly toxic materials in the water that can cause the death of fish larvae. The results of the hatchery technique using this system are deemed sufficient to meet the needs of local seeds, however, the survival value of fish larvae into seeds is still relatively low due to increasing Ammonia from the waste and unmonitored water quality.

The catfish production cycle in the Dempo Jaya Sejahtera group is carried out for 3-4 months, with one month of resting or cleaning the pond. Pond cleaning is carried out mainly for water hyacinth plants which are biologically used as aquatic plants to absorb organic matter in the waters. Also, some fish that are also

pests in ponds such as snakehead fish are cleaned and become a side commodity for catfish farming which is also of high value.

In the cultivation of catfish in the Belinyu community, they are generally fed without measuring. Based on research, a feed dose of 3% of body weight per side per week is the best amount (Arief *et al.*, 2014). This *ad libitum* method was not applied due to the catfish never stopping during feeding time. The amount of feed given is done only by looking at the behavior and health condition of the fish. The feed given is commercial feed with a reasonably high protein content (31-33%) and a little extra in the form of junk fish feed, which is the residual by-product obtained from capture fisheries (sea fish) during the great fishing season. Methods like this should be avoided in catfish farming which is oriented towards production effectiveness and efficiency because it will absorb many feed costs in the production cycle and have an impact on the low profits generated.

Prevention activities for disease and treatment of disease are relatively not carried out due to limited public knowledge. In general, the community responds to ulcer disease that attacks catfish in certain seasons by harvesting it as soon as possible before consuming the increasing number of catfish victims. Research on the use of natural ingredients has been carried out in catfish farming activities in Bangka. The use of kelakai leaves (*Stenochlaena palustris*) has been added to catfish feed to reduce mortality due to *A. hydrophila* bacteria (Dwiputra, 2019). This counseling activity also introduced the use of probiotics (Hariani and Purnomo, 2017) with the addition of several herbs which are essential in increasing the immune system in catfish. These herbal ingredients include turmeric, temu lawak, ginger, and pineapple. The use of turmeric is prevalent in increasing the immune system in fish (Aulia *et al.*, 2018; Riauwaty *et al.*, 2019; Yudasetara, 2019). Meanwhile, the use of ginger is also vital in increasing the immune system to fight disease in fish (Satiwi, 2014; Anis

and Hariani, 2019). In several studies, the addition of vitamin C has also shown pretty good results in improving the immune system and stimulating increased immunity in fish (Pratama *et al.* 2017; Setiyani *et al.*, 2017; Sitohang *et al.*, 2018).

In this community service activity, the application of probiotics with the addition of immunostimulating substances was introduced and practiced at the same time. Counseling about probiotics is given first so that people's understanding of this matter can be better because there is another term, namely prebiotics. The discussion provided also provides space

and understanding for the community to be better so that ambiguous matters, spread through social media and word of mouth, can be straightened out with scientific explanations (Figure 2). The use of commercial probiotics is given as the initial inoculant, then training in the propagation of these probiotics is carried out so that independence in the use of commercial probiotics can be reduced.

The SWOT analysis carried out from community service activities in Bukit Dempo village, Belinyu District, Bangka Regency is focused on providing positive suggestions for the development of freshwater fisheries in Bangka (Table 1).

Table 1. SWOT analysis of aquaculture activities in Balinyu, Bangka Belitung Province.

SWOT Components	Descriptions	Strategy
Internal factors		
Strength	<ul style="list-style-type: none"> - Supporting natural resources - High interest in consuming fish - Human resources for financial development are available 	<ul style="list-style-type: none"> - Potential water areas - Existing processed fishery products (pempek, otak-otak) - UBB produces reliable Bachelor of Fisheries
Weakness	<ul style="list-style-type: none"> - The stigma of consuming freshwater fish is relatively low compared to marine fish - Fishery products are still marketed in the form of fresh fish, and no processing has yet been carried out - Fisheries human resources who choose to work in other sectors in urban areas 	<ul style="list-style-type: none"> - They are performing modern processed products in the form of nuggets, surimi etc. - Providing training in the world of work and entrepreneurship for graduates of fisheries graduates so that they are ready to enter the community
External factors		
Opportunities	<ul style="list-style-type: none"> - The connection of Bangka Belitung Province with other regions - The potential for natural tourism to bring in domestic and foreign tourists 	<ul style="list-style-type: none"> - Land, sea and air transportation that has been smooth allows optimal exploitation of existing natural resources - The source of income and the driving force of the economy can be raised by the fishery industry together with the tourism industry in Prov. Bangka Belitung
Treats	<ul style="list-style-type: none"> - Many of the contaminants in the tin mining activities in this province are carried out illegally - Habitat and water resource damage that has an impact on the balance of the environment and fresh water sources 	<ul style="list-style-type: none"> - It needs strict understanding and management of tin mining that has been carried out for decades - Utilization of <i>Kolong</i> (ex-excavated) for fisheries and water tourism activities that are more responsible and capable of preserving nature in a sustainable manner



Figure 2. Delivering of probiotic application material in the training session and an explanation of the immunostimulating ingredients to be added to the probiotic.

The results of the SWOT analysis are expected to provide input to the local government as well as components that play a role in fisheries development in Bangka Belitung Province. Weighting each component and finding the best solution are expected to be done together gradually (Rangkuti, 1998). Several alternative strategies need to be carried out and synergize between elements of academia (Bangka Belitung University) and related agencies so that the programs provided to the community have a significant impact on increasing productivity in the fisheries sector. We, from the Faculty of Fisheries and Marine, Universitas Airlangga, welcome the cooperation and collaboration in developing fisheries human resources in the Archipelago Province so that they are competitive and can compete with other provinces in Indonesia.

CONCLUSION

Community service activities in Bangka Belitung Province have been successfully carried out together with partners of the Dempo Maju Sejahtera catfish farming community group accompanied by Bangka Belitung University. This program is expected to be a trigger in increasing the added value of catfish aquaculture products by carrying out various processed products such as fish nuggets, dragon legs, fish meatballs, and others. Besides, technical guidance in developing the efficiency of catfish farming is also carried out by assisting in

the application of some appropriate technologies. One of the technologies provided in counseling and training is the application of probiotics and the addition of immune-stimulant ingredients. With assistance from the FPPB-UBB aquaculture department, it is hoped that the sustainability of this activity can continue.

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