Opportunities and its problem for the development of Tilapia aquaculture business in Banjar Regency, South Kalimantan

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Abstract. This paper aims to provide an overview of the potential opportunities for developing tilapia aquaculture and its development problems. The research was conducted in Karang Intan District, Banjar Regency, South Kalimantan in 2021. The method used was a sensus method to 150 respondents and conducting in-depth interviews with representatives of tilapia hatchery business actors in four villages, namely Karang Intan, Padang Panjang, Pandak Daun, and Jingah Habang Ilir. The results of the study indicate that the potential opportunities for developing hatchery aquaculture businesses in Karang Intan District include opportunities for developing aquaculture in Banjar Regency are human resources related to higher education, productive age, mastery of assets and own capital, as well as the availability of adequate land area, potential for a large enough land area owned by business actors, the enthusiasm for work from business actors and the opening of the market. The problems faced include the availability of superior broodstock, the threat of drought, a pandemic disaster due to restrictions, and a flood that only occurred in January this year.

1. Introduction

The enormous fishery potential can provide significant benefits maximally in a sustainable manner for the Indonesian state and people, if managed properly and responsibly [1]. The development of aquaculture is one of the breakthroughs of the Ministry of Maritime Affairs and Fisheries to increase exports. An increase in PNBP of Rp12 trillion in 2024 is expected to be realized, one of which is the development of aquaculture [2]. For 2021, the Ministry of Maritime Affairs and Fisheries has set a target for aquaculture production of around 19.47 million tons consisting of 7.92 million tons of fish and 11.55 million tons of seaweed, an increase of 1.03 million tons from the 2020 production target of 18.44 million tons [3].

The island of Borneo, an island with many rivers flowing, thus dubbed the land of 1000 rivers, is one of the islands with potential for aquaculture. One of the districts in South Kalimantan with potential for aquaculture is Banjar district. The area of Banjar Regency is ± 4,668.50 km2 and is the 3rd largest area in South Kalimantan Province. Banjar Regency consists of 19 sub-districts, 277 villages and 13 sub-districts. The existing river network in Banjar Regency consists of: a) Martapura River; b) Riam Kanan River c) Rim Kiwa River. Banjar Regency has the potential for fisheries and marine resources that are very potential to be developed. Banjar Regency is also one of 5 regencies/cities in the province of South Kalimantan which has the potential for public waters and marine waters. In addition, Banjar Regency has also become one of the pilot Minapolitan areas for catfish commodities. The potential of
this resource has been utilized by the community for fishing and cultivation activities. Aquaculture activities carried out by the community include rearing (including hatchery) fish in earthen ponds (including concrete), tarpaulin ponds, floating net ponds, and cages in the Riam Kanan watershed.

Land fisheries is one of the leading potential districts of Banjar Regency. Banjar Regency has several fish aquaculture potentials, including pond aquaculture with an area of about 791.4 ha with a total production of 25,092.23 tons/year, floating net aquaculture which has 1,125 units with a total production of 6,542.55 tons/year and cage aquaculture with total of 2,259 units with a total production of 7,952.97 tons/year. For the fisheries sector, Banjar is even the largest fishery producing area in Kalimantan. Fish commodities that are widely cultivated by cultivators include tilapia, goldfish, catfish, pomfret and others [4]. In 2020, production data of the Banjar regency fisheries service, cultivated production are 58,953.10 Ton, catch production are 8,766 Ton and production of processed fishery products are 1,074.9 Ton.

Karang Intan sub-district is a sub-district of tilapia hatchery. There are several villages that become hatchery centers, namely Karang Intan Village, Pandak Daun Village, Padang Panjang Village, and Jingah Habang Ilir, but there are some problems to development aquaculture business. Basically, policy is not an absolute thing, but must be done updated regularly to adapt to existing conditions in the field. This study is a field study to see how the existing condition of tilapia aquaculture business is. From the existing conditions, it will be seen that the potential exist in the field, issues that are developing and problems that occur. Between the real conditions in the field and the expected conditions, a gap will be seen. It is this gap that needs to be known to formulate policy strategies and develop recommendations for more sustainable fisheries management good [1]. This paper aims to provide an overview of the potential opportunities for developing tilapia aquaculture and its development problems.

2. Materials and methods
The research was conducted in Karang Intan District, Banjar Regency, South Kalimantan in June 2021. The method used was a survey method by conducting sensus method to 150 respondents and in-depth interviews with representatives of tilapia hatchery business actors in four villages, namely Karang Intan, Padang Panjang, Pandak Daun, and Jingah Habang Ilir. This study used a structured interviews using questionnaires. The study was conducted in June 2021.

The data taken to conduct this study consists of primary and secondary data secondary. Descriptive analysis using to analysis data to show the result research. Condition or status analysis is used to see conditions related to aquaculture. The points made include: (1) performance, issues and problems social sector; (2) performance, issues and problems of the economic sector; (3) performance, issues and other problems. This status will describe the conditions in each sector. The condition/status analysis is carried out by collecting primary and secondary data Secondary [1]. Based on the distribution of respondents by gender, 95% of respondents were male, and only 5% female respondents.

3. Result and discussion
3.1. General Description of Fishery Business in Banjar Regency
Banjar Regency has the potential for fisheries and marine resources that are very potential to be developed. Banjar Regency is also one of 5 regencies/cities in the province of South Kalimantan which has the potential for public waters and marine waters. In addition, Banjar Regency has also become one of the pilot Minapolitan areas for catfish commodities. The potential of this resource has been utilized by the community for fishing and cultivation activities. Fishing activities carried out by the community include fishing activities in marine waters and public waters (reservoirs, rivers and swamps), while aquaculture activities carried out by the community include rearing activities (including hatcheries) of fish in earthen ponds (including concrete), ponds and ponds. tarpaulin ponds, floating net ponds, and cages in the Riam Kanan watershed. In addition, there is also fish rearing with the Minapadi system or fish rearing systems and methods in rice fields in several sub-districts.

Water resources or fishery resources in Banjar Regency that exist and have been utilized by the community for the fisheries and marine sector are as follows:
1. Brackish Waters Banjar Regency does not have a sea, but has a river estuary that is directly connected to the sea, and the estuary of this river is brackish water with a mangrove forested coast. Estuary/brackish waters in Banjar Regency are located in Aluh-Aluh District with an area of +354.38 ha and are used by the surrounding community for shrimp and crab farming businesses.
2. River/DAS (Watershed Area). The area of the watershed (DAS) in Banjar Regency is 779,377 ha. Watersheds that have been used by the community include:
- Martapura River, with an area of 427,113 ha, spanning 70 km from Astambil District to Banjarmasin City;
- Riam Kanan River, with an area of 161,132 ha, spanning 23 km from Awang Bangkal Village to Astambil District, with a management priority of 20.70%;
- Riam Kiwa River, with an area of 191,132 ha, along 60 km from Astambil District to Tapin Regency (Binuang), with a management priority of 24.50%.
3. Swamp Waters Based on soil drainage, there are 12 out of 19 sub-districts that have inundated drainage for 3-6 months covering an area of 65,030 ha and inundated drainage for a year with an area of 79,255 ha.
4. Irrigation Channels In Banjar Regency, there is a technical irrigation system (drainage) covering an area of 25,900 ha. It stretches for 40 km from Mandikapau village, Karang Intan sub-district to Sungai Tabuk sub-district. The potential of these irrigation waters has been utilized by the community on an area of 413 ha for pond cultivation and various fish commodities. Fish commodities that are widely cultivated by cultivators include tilapia, goldfish, catfish, pomfret and others.

Inland fisheries is one of the leading potential districts of Banjar Regency. Banjar Regency has several fish cultivation potentials, including pond aquaculture with an area of about 791.4 ha with a total production of 25,092.23 tons/year, floating net aquaculture which has 1,125 units with a total production of 6542.55 tons/year and cage aquaculture with total of 2,259 units with a total production of 7,952.97 tons/year. For the fisheries sector, Banjar is even the largest fishery producing area in Kalimantan. Capture fisheries cultivation areas are located in the Districts of Aranio, Martapura, East Martapura, West Martapura, Tabuk River, Astambil, Simpang Empat and Fish Landing Base.

The fishery designation area consists of: 1) pond fishery designation area spread across Karang Intan, Martapura, West Martapura, Tabuk River and Astambil Districts. 2) the designated areas for cage and floating net fisheries are scattered in the Districts of Aranio, Karang Intan, Martapura, West Martapura, Tabuk River and Astambil. 3) the allotment area for aquaculture is located in Aluh-Aluh District: 4) The Mina Padi fishery designated areas are spread out in the Districts of Gambut, Sungai Tabuk, West Martapura, Martapura, Lucky Baru and Tatah Makmur. The fishery product processing industrial area is a minapolitan area with the development area covering the Martapura and West Martapura sub-districts covering an area of approximately 4,200.99 hectares.

Fishery production data in 2020 from aquaculture is 58,953.10 tons. One of the sub-districts that is a center for aquaculture is Karang Intan District which is a center for tilapia hatchery. There are several villages that become hatchery centers, namely Karang Intan Village, Pandak Daun, Padang Panjang, and Jingah Habang Ilir. Karang Intan District is indeed a center for tilapia hatchery cultivation. The business is carried out individually on a family business basis. There is an effort carried out in groups with a land size of > 1 Ha.

Karang Intan sub-district is one of the sub-districts in Banjar Regency which has potential fishery resources, especially aquaculture, hatcheries and nurseries of tilapia in ponds. Of the 26 villages in Karang Intan District, there are 8 villages which are the location of tilapia hatchery and nursery centers, namely Karang Diamond Village, Pandak Daun Village, Karang Intan Village, 128 RTP, then Pandak Daun Village 46 RTP, Sungai Jingah Ilir Village 42 RTP, Sungai Landas 30 RTP and Padang Panjang 19 RTP, Sungai Landas Village 15 RTP, Panyambaran Village 12 RTP and Jingah Habang Hulu Village 7 RTP. From the 8 villages, 4 research sample villages were selected, namely Karang Intan, Jingah Habang Ilir, Pandak Daun and Padang Panjang villages.

One of them is doing tilapia seeding business in groups in Padang Panjang Village, Karang Intan District. The group leader is a male of Javanese ethnicity. The length of business since 2014. The total area of land in groups is 4 ha with a hatchery pond of 2,500 m². The area of the seed pond is 42,500 m². The number of pool units being cultivated is 100 ponds. Total production is approximately 100,000 heads per month. A total of 8-10 ponds are cultivated for tilapia hatchery. The pool is an earthen pool. There are 10 tilapia broodstock ponds with a size of 10x25 meters. The capital to make one pool is IDR 3,500,000 with a wholesale system for 15 days. 10 nursery ponds measuring 25x35 meters. Capital of IDR 10,000,000 per pool is worked on for one month. One holding pool measuring 10x25 meters with a capital of Rp. 3,500,000. the total investment amount is IDR 1.2 billion. Sources of capital from
various sources, namely bank loans (BRI) by mortgaging 7 securities, investors and own capital. Until now, there is still 30% that has not been paid off. The source of the broodstock was imported from Tanah Grogot, Pasir Penajam Regency, East Kalimantan. One pond has a capacity of 400 broods with 300 females and 100 males. The frequency of spawning is 1x1 month or 8x a year. The size of the broodstock is 3-4 / kg or sepikul. One pool is equal to 100 kilos or 40,000 / kg.

3.2. The Potential Opportunities and The Problems for the Development of Tilapia Aquaculture Business

One of the potential opportunities in the development of tilapia aquaculture in Banjar Regency is human resources. Socio-economic characteristics of tilapia cultivation business actors in Banjar Regency are quite good in supporting the development of tilapia aquaculture. Karang Intan District is the center for tilapia hatchery cultivation. Cultivation is carried out individually and in groups. Potential opportunities for hatchery aquaculture business in Karang Intan District include the potential for a large enough land area owned by business actors, the enthusiasm for working from business actors and the opening of the market.

Some of the socio-economic characteristics of research respondents were seen from age, gender, education, main occupation and land ownership status. Respondents’ age ranged from 16-74 years with an average age of 43 years. Age characteristics of hatchery cultivators in the four selected villages, the distribution of respondents aged < 30 years was 13%, aged 30-50 were 71% and > from 50 years was 16%. This shows that this age distribution is a productive age group. The sex of business actors is 92% dominated by men.

The average education of the respondents is senior high school. The distribution of respondents who have an elementary school education level is 7%, junior high school graduates are 25%, high school graduates are 62% and universities are 5%. Based on the percentage of education level, it shows that the education level of the dominant tilapia hatchery farmers is quite high.

The distribution of respondents according to ethnicity is 87% from Banjar, 9% from Javanese, 1% from Dayak, 1% from Malay. This shows that the dominant breeding and nursery cultivators are from the local tribe, namely the Banjar tribe.

Judging from the percentage distribution of respondents who have their own asset ownership status of 98%. Only 1% has the status of leased assets and 1% is profit sharing.

The distribution of the average value of total assets owned, 71% of respondents total assets of less than Rp 50 million, 29% of respondents total assets ranged from Rp. 50 million to Rp 500 million. This shows that the scale of the business owned is still small.

Respondents of cultivators surveyed as a whole are business actors who have been active in tilapia hatchery and nursery business in the last one year. The status of the cultivation business is mostly carried out actively by the respondents themselves.

The average distribution of the total turnover of respondents in conducting tilapia hatchery business is 98% less than Rp 300 million per year and 2% of the total turnover of Rp 300-2.5 billion per year. The average land area owned by respondents is below 1000 m2. This is because in general, tilapia hatchery in Banjar Regency is a community hatchery unit and does not use a large area of land, so the entire land area owned is used for tilapia hatchery cultivation. The area of cultivated land owned in general is < 1000 m2.

From the distribution of respondents according to their business income, 7% of respondents have an income of Rp. 2-4 million per month, 28% of respondents have an income of Rp. 4-6 million per month, 17% have an income of Rp. 6-8 million per month and 48 % have income greater than IDR 8 million per month.

The distribution of respondents by source of capital is 100% of respondents using their own capital to carry out tilapia hatchery business. Based on the distribution of respondents who have the potential to save, 30% have savings of IDR 2 million, 34% of respondents have savings of IDR 2-4 million, 17% of respondents have savings of IDR 4-6 million, 7% of respondents have savings of IDR 6-8 million , 13% of respondents have savings above IDR 8 million. From the distribution of respondents, there is not a single respondent who does not save.

The large potential for tilapia hatchery cultivation in Banjar Regency has attracted business people from outside, including the Comfeet company. The entry of these entrepreneurs is a problem for micro-scale business actors, related to marketing. The problems faced include the availability of superior
broodstock, the threat of drought, a pandemic disaster due to restrictions, and a flood that only occurred in January this year. For recovery, in the field of fisheries there is still no intervention from the government, only the data is only being recorded. Some of the obstacles encountered were:
- In 2019 Long dry
- In 2020 the covid pandemic, there is a blockage
- In 2021 flood

4. Conclusions
4.1. Conclusions
Potential water resources in Banjar Regency that exist and are utilized by the community for the fisheries sector, one of which is aquaculture. The results of the study indicate that the potential opportunities for developing hatchery aquaculture businesses in Karang Intan District include opportunities for developing aquaculture in Banjar Regency are human resources related to higher education, productive age, mastery of assets and own capital, as well as the availability of adequate land area, potential for a large enough land area owned by business actors, the enthusiasm for work from business actors and the opening of the market.

The problems faced include the availability of superior broodstock, the threat of drought, a pandemic disaster due to restrictions, and a flood that only occurred in January this year.

4.2. Recommendations
The recommendation from this study are planning for the future, Banjar district will build this integrated tilapia aquaculture from upstream to downstream. One of them is by opening partnership opportunities with feed mill manufacturers in Banjar Regency. Future programs: partnerships from upstream to downstream, human resource development, training and technology for hatchery cultivation and knowledge

5. References
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