CASE STUDY OF JATILUHUR RESERVOIR AS A POTENTIAL FARMING FISHERIES ACTIVITIES

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ABSTRACT

The land around the Jatiluhur Reservoir is utilized by the community as a residential area, industry, aquaculture activities using a floating net cage system (KJA), and even agriculture. This affects the quality of the surrounding ecosystem. Based on the results of water quality analysis in four sub-districts, namely Tegalwaru, Sukasari, Sukatani, and Jatiluhur Subdistricts to be used as a parameter for the Jatiluhur Reservoir pollution index, it was found that the condition of the waters was lightly to moderately polluted due to high levels of phosphate and nitrate. This can increase the BOD value (*Biochemical Oxygen Demand*) and TSS (Total Dissolved Solids). With the use of the Jatiluhur reservoir as a place for fish farming activities, of course we have to know about the potential feasibility of the Jatiluhur reservoir as a fish farming activity based on the water conditions. The condition of the waters can be seen from the water quality as based on physical factors, chemical factors, and biological factors in the waters of the Jatiluhur Reservoir. To find out the potential feasibility of the Jatiluhur reservoir as a cultivation activity, a SWOT analysis is needed. This study uses the method of reviewing various literature which is then carried out a SWOT analysis. The approach to reservoirs that is managed in an integrated manner is carried out through implementation, including the following: 1) As a coordinator and director of existing sector activities; 2) So that the utilization of aquatic natural resources can be carried out optimally; and 3) Integrated fisheries natural resource management activities and the desired goals are achieved (Krismono 1988 *in* Siagian 2014). Guarantees that need to be considered for the use of floating net cages in a reservoir, namely: 1) Total waste generated; 2) The developed KJA can suppress negative impacts; and 3) Bearing capacity must be considered. The principles used to develop aquaculture are sustainability and responsibility.

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Keyword : *Reservoir, Fisheries, Aquaculture*

Background

Djuanda Reservoir or Jatiluhur Reservoir is a dam which has an area of 8.3 and is located in Purwakarta Regency, West Java. This reservoir is used as a cultivation activity with the KJA system because it can increase profits and increase the level of the economy. Therefore, the Jatiluhur Reservoir was chosen as a case study material because there is a difference between the cultivation that is usually carried out by the community and the cultivation that uses KJA, where the thread used is thread*polyethilene*. Apart from being used for cultivation activities, this one reservoir is used for tourism, irrigation channels, and supplying raw water, as well as hydropower (Deswati & Adrison 2019).

The Jatiluhur Reservoir KJA began in 1974 and was only carried out intensively in 1986. According to Yuliana (2018), fish farming activities with a floating net cage system provide profits and help the community's economy, even though in the end they prefer to work as laborers rather than owning KJA. The high number of KJA causes*double effect* with production reaching 94.5 thousand tons. This has a positive impact on Purwakarta Regency because it is known as an area that produces the highest cultivation. Therefore, aquaculture activities are very suitable to be carried out in the Jatiluhur Reservoir (Yuliana 2018).

Condition of Jatiluhur Reservoir

The land around the Jatiluhur Reservoir is utilized by the community as a residential area, industry, aquaculture activities using a floating net cage system (KJA), and even agriculture (Pratama & Chamid 2021). This affects the quality of the surrounding ecosystem. Based on the results of an analysis of water quality in four sub-districts, namely Tegalwaru, Sukasari, Sukatani, and Jatiluhur sub-districts conducted by Pratama & Chamid (2021) to be used as a parameter for the Jatiluhur Reservoir pollution index, it was found that the condition of the waters was lightly to moderately polluted due to phosphate and nitrate levels. that is so high. This can increase the BOD value (*Biochemical Oxygen Demand*) and TSS (Total Dissolved Solids).

Adawiah,*et al.*(2021) conducted research at three location points, namely Panyingkiran, Pasir Jangkung, and Pasir Camar to analyze the fertility of the waters used for aquaculture activities using the floating net cage system in the Jatiluhur Reservoir. The data taken are phosphate and nitrate. It was found that the highest phosphate level was at Pasir Gull with a value of 0.956 mg/L while the lowest was at 0.0206 mg/L for the Panyingkiran point. While the highest nitrate value is also owned by Pasir Gull with a value of 4.4998 mg/L and 3.7731 mg/L for the Pasir Jangkung point as the lowest nitrate. These three points are classified as mesotrophic waters when viewed from the nitrate content. Based on the phosphate content, the waters are mesotrophic for Panyingkiran, oligotrophic for Pasir Jangkung, and eutrophic for Pasir Canar. According to Effendi (2003)*in*Isnaeni,*et al.*(2015), mesotrophic waters are the status of waters that have moderate nutrients, while oligotrophic is the status of waters that have low nutrients, while eutrophic is a trophic condition of waters with high nutrients.

SWOT Analysis Based on Physical, Chemical and Biological Conditions

With the use of the Jatiluhur reservoir as a place for fish farming activities, of course we have to know about the potential feasibility of the Jatiluhur reservoir as a fish farming activity based on the water conditions. The condition of the waters can be seen from the water quality as based on physical factors, chemical factors, and biological factors in the waters of the Jatiluhur reservoir (Hontong,*et al.*2019). To find out the potential feasibility of the Jatiluhur reservoir as a cultivation activity, a SWOT analysis is needed. SWOT analysis is an analytical technique to determine strengths*(strenght)*, weakness (*weakness)*, chance (*oportunities)*, as well as threats (*threat)*. According to Rangkuti (2016), this analysis includes an analysis to compare internal factors (strengths and weaknesses) and external factors (opportunities and threats) to find out the potential if cultivation activities are carried out at the Jatiluhur Reservoir location based on the water conditions.

BairdBased on the SWOT analysis for the feasibility potential of the Jatiluhur reservoir for aquaculture activities in terms of the condition of the waters, a strategy for developing aquaculture activities in the area can be carried out by looking at several water factors in the Jatiluhur reservoir, including:

a) Create a fishery spatial plan for sustainable management of waters.

b) Rationalizing fish biomass in floating net cages (KJA) for sustainable fish farming by limiting the number of fish cultivated.

c) Stocking fish to increase fish catches and overcome high plankton abundance.

d) Create an early warning system for fish mortality to prevent mass fish mortality from occurring*Upwelling* or Umbalan

e) Modify environmentally friendly floating net cages (KJA) to utilize leftover feed or fish feces for fertilizer and nutrients for plants. f) Carry out water hyacinth weed control to reduce*blooming* in Jatiluhur Reservoir.

g) Create*Aeration*in the area of floating net cages (KJA) using aerators to overcome the low concentration of water in the cultivation location.

Feasibility of Aquaculture Business

Sustainable fisheries development in the Jatiluhur reservoir is Development*Culture Based Fisheries/* CBF, and fish farming in KJA. Fishery activities in the Jatiluhur reservoir have been growing since the reservoir began operating. One of the fishery activities that is developing in the Jatiluhur Reservoir is aquaculture, namely growing fish in floating net cages (KJA). Business feasibility, especially in aquaculture in the Jatiluhur Reservoir, can be seen from three aspects, namely physical, chemical and biological (Astuti,*et al.*2016).

The physical parameters in the Jatiluhur Reservoir are the green color of the reservoir water, this indicates a high algae content in the Jatiluhur reservoir waters. Algae content in waters can be caused by high levels of nutrients due to fish feed waste. Reservoir water turbidity in zone 1 is 1.00, zone 2 is 0.75. The turbidity rate is still in accordance with the provisions in Government Regulation No. 82 of 2001, which is less than 5 NTU. Furthermore, the water temperature in the Jatiluhur reservoir is 29.4^{O}C, this is still relatively good because the good temperature range for fish farming with the KJA system is 27-30°C^{O}C. Then the dissolved solids in the Jatiluhur reservoir water are 95.00 mg/L. This figure meets the

requirements in PP No. 82 of 2001, namely a maximum of 1000 mg/L (Rahardjo 2019).

Chemical parameters in the Jatiluhur Reservoir include measurements*Chemical Oxygen Demand* (COD) at point 1 was 19.00 mg/L, point 2 was 18.50 mg/L,*inlet* DAM of 26 mg/L and on*outlet* DAM of 20.33 mg/L. This figure is still appropriate, namely based on PP No.82 of 2001 the maximum value of COD for freshwater fish farming is 50 mg/L. Then the BOD content in the Jatiluhur Reservoir is 5.55 mg/L, this is still in accordance with PP No. 82 of 2001 where the maximum value of BOD for freshwater fish farming is 6 mg/L. Content*Dissolved Oxygen* (DO) the*inlet* DAM of 9.00 mg/L and on*outlet* DAM of mg/L. This figure meets the requirements for freshwater fish farming, namely with the minimum requirement of dissolved oxygen, which is 6 mg/L. Then the Ph value of the reservoir at*inlet* DAM of 7.61 and*outlet* DAM of 6.45. This figure is still sufficient, where the pH of the water for freshwater fish farming is 6-9. An appropriate pH is needed in fish farming because a very low pH causes the solubility of metals in water to increase, which can be toxic to aquatic organisms, if the pH is too high it will increase the concentration of ammonia in water (Rahardjo 2019).

The biological parameters in the Jatiluhur reservoir include the abundance of plankton which is dominated by*Dinophyceae, Chlorophyceae* and*Cyanophyceae*. The high abundance of phytoplankton is due to its high tolerance for water conditions. The biggest percentage for phytoplankton diversification is class*cyanophyceae*, identified 6 classes of phytoplankton and 20 genera (Corsita,*et al.*2019). The types of fish cultivated are tilapia, carp, and catfish (Astuti,*et al.*2016). Based on the physical, chemical and biological conditions of the Jatiluhur reservoir waters can be categorized as suitable for fish farming. The aquaculture business that has developed in the Jatiluhur reservoir is using the Floating Net Cages (KJA) system.

Cultivation Policy Analysis for Development

According to Law no. 11 of 1974 Article 8 Paragraph (2)*in*Ambong (2018), reservoirs can be used as water sources, including: 1) Drinking water, households, national defense and security, worship, urban businesses; 2) Agricultural, plantation and fishery activities (including aquaculture); and 3) Industry, mining, water traffic, and recreation. Based on RI Government Regulation No. 22 of 2021, the quality standard for lake water and the like used for aquaculture activities is class II quality standard. Aspects that must be met are physical aspects (temperature, salinity, and water discharge), chemical aspects (DO, pH, alkalinity, ammonia, nitrate, nitrite, and phosphate), and biological aspects (abundance of plankton, benthos, and periphyton) (Ambong 2018).

Conclusion

The approach to reservoirs that is managed in an integrated manner is carried out by means of implementation, including the following: 1) As a coordinator and director of sector activities There is; 2) So that the utilization of aquatic natural resources can be carried out optimally; and 3) Integrated fisheries natural resource management activities and the desired goals are achieved (Krismono 1988*in*Siagian 2014). Guarantees that need to be considered for the use of floating net cages in a reservoir, namely: 1) Total waste generated; 2) The developed KJA can suppress negative impacts; and 3) Bearing capacity must be considered. The principles used to develop aquaculture are sustainability and responsibility. According to the Minister of Maritime Affairs and Fisheries, Sakti Wahyu Trenggono in Ambari (2022), this aims to increase fishery production for all types of commodities and can contribute to food security in the national and even international scope. According to FAO General Qu Dongyu*in*Ambari (2022), by carrying out cultivation activities, the country's economy can grow rapidly and food security can be maintained.

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