PRODUCTIVITY ANALYSIS OF FRESHWATER FISH FARMING FLOATING NET CAGE SYSTEM : A Case Study of Cibinong Village, Jatiluhur District, Purwakarta Regency

ABSTRACT

This research aims to analyze the productivity of freshwater fish farming with a floating net caramba system in Cibinong Village, Jatiluhur District, Purwakarta Regency. In addition to some characteristics of farmers and aquaculture businesses, an assessment of good fish farming methods is also used as complementary data for research. zone 1 or coincides in Cibinong Village, namely at the Port of LLASDP Usman Embankment. The study will run from December 2022 to May 2023. This research is descriptive quantitative using survey method. The data required are quantitative data that are primary and secondary. Primary data were collected through two types of collection techniques, in the form of observation and interviews by filling out questionnaire sheets. While secondary data in this study were obtained data from the Fisheries and Livestock Service, Central Statistics Agency, books, scientific journals, theses, internet, and other reference materials from previous research. The object of research is a floating net caramba freshwater fish farmer in Cibinong village. The sampling as respondents was carried out by purposive sampling method. The results showed that the productivity of freshwater fish farming business in floating net caramba amounted to 482,265 tons / ha, fast water ponds 434,771 tons / ha, and calm water ponds 18,547 tons/ha. The productivity of Tilapia in cages 7x7 m^2 produces as much as 14,286 kg / m^2, Carp in cages 7x14 m^2 produce 10,204 kg/m^2, and Patin in cages 7x14 m^2 produce 25,510 kg/m^2.

Keywords: Productivity, Floating net cages, Freshwater fish

INTRODUCTION

Purwakarta Regency has a potential amount of aquaculture production. Based on data from related, namely the Fisheries and Livestock Office of Purwakarta Regency, the total amount of aquaculture production in Purwakarta Regency in 2022 is 108,715.52 tons. The amount of production is from all fishery commodities in Purwakarta Regency according to the business branch of Purwakarta Regency in 2022. There are several commodities that have a fairly high amount of production. Some of the main commodities include Goldfish as much as 44,910.25 tons, Tilapia Fish reaching 33,263.59 tons, Gurame Fish as much as 71.21 tons, Patin Fish as much as 18,319.55 tons, Catfish as much as 802.31 tons, Siamese Sepat Fish as much as 47.22 tons, and Pomfret Fish as much as 11,301.39 tons. The number of fish commodities produced on average is produced in the business of floating net caramba cultivation, cultivation in fast water ponds and calm water ponds. The total amount of production produced in the cultivation of Floating Net Karamba amounted to 106,513.00 tons with a production value of Rp 1,553,132,440.00.

Fish farming systems with floating nets are an ideal means of aquaculture and are usually placed in waters such as lakes, reservoirs, lagoons, straits and bays in Indonesia. Each region must have different potentials, Jatiluhur Reservoir is one of the freshwater areas located in West Java Province which has many aquaculture activities, more precisely

using the Floating Net Karamba system (KJA). Cibinong Village is one of the villages located in Jatiluhur District. Floating Net Cage fish farmers in Cibinong Village are generally the most dominant is the number of KJA owned as many as 8 to 12 cage plots, there are even some farmers who have more than 20 cage plots. From the observations at the research site, that the number of KJA plots cultivated by cultivators in Cibinong Village is less than other villages, this is because the KJA business in Cibinong Village is only in the form of a family business and the capital comes from limited personal funds.

This study aims to analyze the productivity of freshwater fish farming business with a floating net caramba system in Jatiluhur Reservoir, Purwakarta Regency. This research is expected to be used as a source of reference and insight for the government to increase aquaculture business from the amount of freshwater fish production in floating net caramba in a sustainable manner.

MATERIAL AND METHODS

Location and Time of Research

This research was carried out in zone 1 or coincided in Cibinong Village, namely at the Port of LLASDP Usman Embankment. The study will run from December 2022 - May 2023.

Types and Methods of Data Retrieval

This research is a quantitative descriptive research. The method used in this study is the survey method. The data required are quantitative data that are primary and secondary. Primary data were collected through two types of collection techniques, in the form of observation and interviews by filling out questionnaire sheets. While secondary data in this study were obtained data from the Fisheries and Livestock Service, Central Statistics Agency, books, scientific journals, theses, internet, and other reference materials from previous research.

Sampling Method

The respondent retrieval technique in this study uses Purposive Sampling Technique or sampling in accordance with predetermined criteria to meet the research objectives, such as taking special samples from communities carrying out fishery activities in the Cibinong village area, Jatiluhur district. In this Purposive sampling technique, the number of respondents is not something that must be considered but the potential of each case to provide a good theoretical understanding of the aspects studied. Some of the criteria of respondents sampled in this study, namely:

a. Freshwater fish farming communities with the Floating Net Karamba system who live in Cibinong Village
b. Freshwater fish farming communities with the Floating Net Karamba system who have at least 5 years of business experience
c. Freshwater fish farming communities with the Floating Net Karamba system who are willing to be interviewed

Data Analysis Methods

Analysis of freshwater fish farming productivity with floating net caramba system in Cibinong Village, Jatiluhur District, Purwakarta Regency using quantitative descriptive analysis. The analytical tools used to calculate productivity in this study are presented as follows (Nasrullah *et al* 2021):

1. Productivity

$$PSL\ (kg/m^2) = \frac{\Sigma\ Pmt\ (kg)}{\Sigma\ LL\ (m^2)}$$

Information:
PSL = Productivity per Unit Area (kg/m^2 per stocking season)
Pmt = Production per stocking season (kg)
LL = Land Area (m^2)

RESULTS AND DISCUSSION

Characteristics of Respondents

The characteristics of respondents used include age group, level of education, and Floating Net Cage Cultivation Business Experience.

Age Group

Based on the gender of respondents, KJA fish farmers in Cibinong Village have male gender. Based on the results of interviews with respondents, men play an important role in carrying out fish farming activities, while their wives play an important role in decision-making in domestic activities such as taking care of children, doing public household chores, and providing food. The age classification according to Amin (2017) based on the Ministry of Health is early adulthood: 26-35 years, late adulthood: 36-45 years, early elderly: 46-55 years, late elderly: 56-65 years. According to age characteristics, most fish farmers are late adults as much as 14%, early adulthood as much as 9%, followed by early elderly age as much as 13%, and only 3 people are included in the late elderly category. Based on the characteristics of residential conditions and status, most cultivators have wall house conditions with rental land status as much as 53%, while the rest of the residential land status is freehold as much as 47%. This is because the average KJA fish farming community in Cibinong Village is an immigrant.

Level of Education

Based on the level of education seen, namely from the length of education, most fish farming communities, namely 33%, have studied for 6 years or graduated from elementary school, as many as 30% graduated from junior high school, as many as 20% did not continue school, and only 5 people studied until graduating from high school. The level of education taken among cultivating communities varies greatly. The higher the level of education of fish farmers, the higher the understanding and awareness of the importance of maintaining the sustainability and sustainability of natural resources in utilizing waste feed that is wasted into the waters, this can minimize damage to the main function of reservoirs from KJA activities. The characteristics of respondents based on religion and ethnicity, most of them are Muslim and Sundanese and they interact using Indonesian and Sundanese as daily communication tools.

Floating Net Cage Cultivation Business Experience

Based on the characteristics of KJA's business experience, fish farmers mostly have 50% 5-15 years of business experience, followed by 43% of 16-25 years of business experience, and only 2 people or as many as 7% have more than 25 years of KJA business experience. According to Kurniasari (2020), the length of business experience possessed will play an important role in increasing knowledge and expertise in running his business effectively. Based on livelihood characteristics, most fish farmers place this KJA business as the main livelihood as much as 57%, and the rest as a side livelihood.

General conditions of freshwater fish rearing cultivation

KJA businesses generally use a framework made of U-iron, bamboo, and bread (Afrin *et al* 2015), but at this time the KJA business that is widely developed in Jatiluhur Reservoir is using a frame that is still made of bamboo. KJA is placed in the cultivation location in a row between one unit and another KJA unit and connects with each other, the aim is to make it easier for KJA owners or guards to maintain and supervise it. The types of fish commodities cultivated are Gold, Tilapia, and Patin. Fish farmers who have KJA businesses in Cibinong Village are generally the most dominant KJA with 8 cage plots, 6 cage plots, 12 cage plots, there are even some farmers who have more than 20 cage plots. From the observations at the research site, that the number of KJA plots cultivated by cultivators in Cibinong Village is less than other villages, this is because the KJA business in Cibinong Village is only in the form of a family business and the capital comes from limited personal funds.

Based on the number of plots owned, the largest range of plots owned is between 6 to 12 plots with the number of cultivators as many as 17 people or 57% of the total number of cultivators. A total of 9 people have cage plots between 12-16 cage plots, and as many as 4 cultivators who have more than 16 cage plots.

The area of the floating net caramba plot

There are two cultivation patterns developed, namely the first pattern of tilapia farming with Patin fish and the second pattern of Goldfish only cultivated on coloring net 2. Only some farmers also use a 3-layer net cultivation pattern, where the upper net measuring 7 x 7 m is filled with goldfish, the second net is a 2 coloring net measuring 7 x 14 m filled with tilapia, and the bottom net measuring 4 measuring 14 x 14 m is filled with catfish. The first pattern of tilapia farming with catfish, tilapia is stocked in the first layer net plot (upper net or eagle), while catfish are stocked in the second layer net (bottom net color 2). The second pattern, carp farming only stocked on coloring nets 2.

Seed Source

Based on observations at the research site, as many as 24 cultivators or 80% of the total number of cultivators who were used as respondents preferred to produce their own seeds. Such seeds during maintenance are stored on waring. Usually, the seeds resulting from the tilapia process itself are tilapia fry, because according to one fish farmer said that if you buy tilapia fry on land, the results will definitely not be good and eventually die. It is caused by congenital diseases from the previous place.

The distribution of fish fry into cages according to farmers in Cibinong Village is usually carried out in the morning or evening. There are several farmers buying Tilapia, Mas and Patin fry at Balai Benih from outside the area such as BBI Bandung, BBI Subang, and BBI Plered. According to farmers, if they are late in producing their own fish fry then they often buy fry. Usually, fish fry purchased by farmers have varied sizes, namely the size of tilapia and ordinary carp fry to buy a disclaimer size of 100 heads / kg, at a price of Rp. 250 per tilapia or Rp. 25,000 /kg, and a price of Rp. 350 per carp or Rp. 35,000 /kg. Farmers usually buy catfish fry size of 5-7 cm /head at a price of Rp 700 /head.

Feed Source

The process of fish enlargement in KJA in the cultivation pattern applied by farmers in the Jatiluhur reservoir is in an intensive way by providing artificial feed (commercial) as a food source during fish rearing. As many as 30 KJA cultivators or 100% of all cultivators who were used as respondents received commercial feed during maintenance sourced from feed mill agents. The famous feed agent in Cibinong Village is H. Suherman's feed warehouse where the feed is from eFishery. The cultivators make temporary payment transactions in purchasing feed by getting a loan of 20 million in the form of feed until it has a maturity of 3 months. If it expires, the cultivators must deposit money to pay for feed.

The brands of feed purchased are quite varied, including those that use sinta feed, CPP feed, and provit feed. But for now the feed that is often used by farmers is the NewHope feed brand. For seeds that have just been stocked until one month old, the feed given is SNA-1 sinta type floating pellet feed with a size that matches the mouth opening of the fish, this pellet has a min protein content of 30% at a price of Rp 358,000 per 30 kg or Rp 11,933 /kg. In addition, NewHope Aqua Feed floating feed has a protein content of 28%-30% at a price of Rp 318,000 per 30 kg or Rp 10,600 /kg. Then for sinking feed, farmers usually buy NewHope Grande feed brands with a minimum protein content of 27-29% at a price of Rp 530,000 per 50 kg or Rp 10,600 /kg.

Floating Net Cage Aquaculture Production

Production is an activity in creating or adding use value to commodities of goods or services. The cultivation process has the main commodity, namely Fish, so the meaning of production of cultivated products is the amount of all fish produced by farmers during the cultivation process in one fish farming harvest (Kg / harvest). The results of observations in the field of the production process of raising tilapia in floating net cages if full feed is generally carried out for 3.5 months of maintenance in one production period, but if not given feed it is carried out for 6 months of maintenance in one period. The production process of carp rearing is carried out for 3 months in one production period, while the production process of catfish rearing is carried out for 2 years in one production period. The duration of fish maintenance is carried out to obtain a size that is in accordance with market demand. The maintenance of Goldfish and Tilapia during one production period found fish sizes ranging from 250-350 grams per head or 3-4 heads per kg. This is in accordance with SNI 6495:2011, that the weight of fish at harvest time is 250-500 grams with a total length of 15-25 cm.

There were 18 cultivators with a percentage of 60% of the total number of cultivators respondents, resulting in a total production of less than equal to 1.000 kg. The lowest production amount in that range is 600 kg. There were 11 cultivators with a percentage of 37% of the total number of cultivators who were respondents, resulting in a total production of between more than 1000 kg to 2.000 kg. While the range of production with the smallest quantity of cultivators is the range of production amounts of more than 2.000 kg. In that range, there is only 1 cultivator with a total production of 2.500 kg.

Selling Price

As many as 30 farmers out of the total number of farmers made respondents sold fish mostly to cities, and a small part to consumers or residents. The selling price of tilapia is IDR 23,500/kg, carp IDR 30,000 /kg, and catfish IDR 12,000 /kg. The selling price is the selling price to the dealer, while the selling price of retail tilapia to consumers directly ranges from Rp 25,000 - 28,000 /kg and carp costs around Rp 35,000 - 40,000 /kg.

Assessment of Good Fish Farming Practices (CBIB).

The CBIB assessment has terms and conditions based on the Directorate of Aquaculture production section. The CBIB requirements include 17 (seventeen) conformity assessment criteria, including suitability of location, water source, design and layout, equipment, preparation of cultivation containers, seeds, stocking densities, feed, health management, water management, cleanliness of locations and facilities, harvesting and post-harvest, waste management, environmental management, workers, training and documentation.

Based on the provisions of the Directorate of Aquaculture, an assessment of freshwater fish farming business activities with a floating net caramba system in Cibinong Village in Table 1 can be obtained as follows:

Table 1. Conformity assessment of CBIB Floating Net Cages in Cibinong Village

Assessment Aspect	Assessment Results		Keterangan
	Compliant	Non-Compliant	
Location	✓		Cultivation environmental conditions in accordance with food safety avoid pollution
Water Source		✓	Access to water sources comes from a mixture of factory and human waste
Design and Layout	✓		The aquaculture business area is well used for fish farming with a floating net cage system
Equipment	✓		Cultivation equipment is made from harmless materials and is easy to clean
Preparation of cultivation containers		✓	There is no preparation of containers by sanitary means to avoid negative impacts on the environment
Seed		✓	Seeds are not informed by authorized agencies or laboratories
Solid Stocking		✓	Stocking density has not complied with

			Indonesian National Standards (SNI) 6495:2011 and (SNI) 01-6494.1.2000
Feed	✓		Feed is stored in clean containers and the storage method corresponds to the type of feed under hygienic conditions
Health Management		✓	Fish affected by the disease are not isolated and/or quarantined and not tested in the lab
Water Management		✓	There is no efficient water quality management and it is not measured periodically
Cleanliness of Location and Facilities	✓		Facilities and locations are kept clean and protected from contamination
Harvesting and Post-Harvest	✓		Harvesting equipment is made of harmless materials and handling uses clean water and ice
Waste Management		✓	Handling of liquid and solid waste to avoid environmental impacts is not carried out
Environmental Management		✓	Not conducting periodic monitoring of the quality of the cultivation environment
Worker	✓		Workers who handle crops in good health and free from infectious diseases
Training		✓	Workers have not been socialized and understand Good Hygiene Practices (GHP)
Documentation		✓	Not documenting all pre-production, production, harvest and post-harvest for traceability

Source: Processed from Primary data (2023)

Based on the table 1, it is known the suitability of Good Fish Farming Methods for fish farmers with the floating net cage system in Cibinong Village. Appropriate criteria include location, design and layout, equipment, feed, cleanliness of sites and facilities, harvesting and post-harvest, and workers. Criteria that are not yet appropriate include, water sources, preparation of cultivation containers, seeds, stocking solids, health management, water management, waste management, environmental management, training and documentation.

In the location assessment, Cibinong Village is an area that has great potential for developing floating net cage cultivation business, because it is located close to the Jatiluhur embankment and reservoir. The cultivation location of Cibinong Village is included in zone 1 where the zone is safer from the growth of water hyacinths than in zones 2 and 3. Cibinong Village is also located in an industrial area, one of which is a drinking water installation.

The layout and design of the floating net cage system cultivation business in Cibinong Village is good and in accordance with CBIB. Floating Net Cages are placed in cultivation locations in rows between one unit and other Floating Net Cage units and connect to each other, the aim is to make it easier for business owners or guards to maintain and supervise them. The layout and design of the aquaculture plot are also very good for the development of sustainable fish farming, and the aquaculture equipment is made of harmless and easy-to-clean materials, so it can be said that the layout and design are in accordance with the CBIB.

Feed assessment, cultivation business with the Floating Net Cage system has been intensive by utilizing commercial feed. Commercial feed is easily available because of the availability of many feed warehouses and is easily affordable by cultivators close to the cultivation location. Commercial feed is stored in clean containers (feed barrels) and the storage method is in accordance with the type of feed under hygienic conditions. This certainly can support the floating net cage business in Cibinong Village.

Harvest and post-harvest assessments in floating net cage businesses have used ice and clean water in the fish shipping process, and harvesting equipment made of non-hazardous materials. The use of ice is usually borne by the city which will send fish to several regions, so it will not affect the production costs that will be borne by the farmers. Floating Net Cage farmers raise fish in the traditional way by using bamboo, although with traditional equipment but they know and have technology about fish farming that is good and correct.

The assessment of container preparation has not been in accordance with the CBIB criteria assessment because the preparation process is not in a sanitary way to avoid negative impacts on the environment. But KJA cultivators in Cibinong Village when it is harvest time will check the nets or net services first regularly by drying the nets and sewing damaged nets. The net service is carried out every 3 months or when you want to harvest.

Water management assessment is not in accordance with CBIB, which is an assessment of water management that is poorly controlled efficiently and not measured periodically. So that water quality cannot be well known for aquaculture business. This will certainly result in a negative impact on the survival of fish.

The assessment of water supply has not met the CBIB assessment criteria because access to water sources comes from a mixture of factory and human waste. water source originating from Jatiluhur Reservoir as a state public company that makes water supply continuously provides raw water throughout the year. Water from the Jatiluhur reservoir is also supplied for agricultural irrigation. In the rainy season the water quality will usually decrease. If there is a decrease in water quality, upwelling can occur due to changes in the speed and flow pattern of reservoir water that causes umbalan or backflow, this will result in many fish dying en masse which can harm floating net cage business owners.

Assessment of seeds and stocking density, many cultivators produce their own seeds so that the seeds stocked on average have a size that is not ideal enough to be stocked, but at certain times there are only a few cultivators getting seeds from BBI. The density of seed stocking commonly carried out by cultivators in Cibinong Village is high, and has not complied with the Indonesian National Standard (SNI) 6495:2011 and (SNI) 01-6494.1.2000. The seeds obtained by the cultivators have not met the CBIB assessment criteria because the seeds obtained have no information from the authorized agency or laboratory. However, according to respondents' interviews, the Purwakarta Regency Government has provided assistance in the form of seeds through the Livestock, Fisheries and Village Office.

Assessment of health management with the use of chemicals, biology and fish drugs is still poorly used in the cultivation process with a floating net cage system in Cibinong

Village. Fish affected by the disease are not isolated or quarantined and not tested in the lab. Tilapia and dead goldfish will usually be given to catfish as natural feed. The use of probiotics is still widely used by cultivators, but their use is still adjusted to the level of need. The use of chemical, biological and medicinal fish is substituted with natural or still traditional ingredients such as using papaya leaves, noni fruit, and other antibiotic plants. The provision of drugs and vitamins for farmed fish is usually during the transition season, because according to the results of respondent interviews, these months are prone to causing fish death.

Waste disposal assessment is also a concern because it can result in pollution to other fish farming containers. One of them is the activities of the residents of the Floating Net Cage to produce waste from toilets and solid waste which will cause its own pollution problems. Waste that contains toxins and is full of parasites and fish diseases can spread through water media. Handling of liquid and solid waste to avoid environmental impacts must be carried out through sanitation and follow-up processes.

The assessment of workers is in accordance with the CBIB assessment criteria, the workers who handle the process during maintenance and the harvest are healthy and free from infectious diseases. A small number of KJA business owners in Cibinong Village recruit workers to help during the maintenance process. The assessment of training to workers has not received socialization and understanding of Good Hygiene Practices (GHP).

Documentation assessment is not carried out properly by cultivators, so it is difficult to know the amount of profit or total cost. Only a few farmers record the time of feed purchase and feeding schedule through notes or small books. Remedial actions are carried out only through the process of subjective observation of the cultivator. The amount of repair costs is not included in the calculation, causing economic anomalies in the event of damage.

Productivity of Freshwater Fish Farming Business

Productivity is generally defined as a correlation between physical results that exist in reality with actual inputs, besides that productivity is also a stratum of efficiency in producing goods and services (Kurniallah 2018). Based on this understanding of productivity, it can be concluded that productivity is a comparison of the results of actual achievement with the overall resources that have been used.

Productivity can be measured through the parameters of Survival Rate (SR), absolute length growth, absolute weight growth, Total Weight Gain (TWG), Average Daily Gain (ADG), Specific Growth Rate (SGR), and Food Convertion Ratio (FCR) (Alatorre *et al* 2012).

Table 2. Productivity of the vast unity of Purwakarta Regency in 2022

Productivity (ton/ha)		
Floating Net Cage	Fast-water pool	Calm water pool
482.265	434.771	18.547

Source: Processed from Primary data (2023)

Based on the research of Amidarhana (2010) in a journal entitled "Analysis of Fish Farming Business Productivity in Floating Net Cages in Jatiluhur Reservoir, Purwakarta Regency, West Java Province", it was explained that the aquaculture business carried out by KJA fish farmers is divided into monoculture and polyculture aquaculture businesses. The calculation results of the analysis of fish farming business in KJA show that both businesses are profitable. The average income of monoculture business type is IDR 159,233,246.00 and polyculture business type is IDR 253,804,786.00 so that R/C for monoculture business is 1.35 while R/C for polyculture business type is 1.70. The average productivity of polyculture business types is greater than monoculture business types. In general, what makes this happen is because the output produced by the type of polyculture business is greater, which is 318,417.67 kg while the type of monoculture business is 118,256.00 kg. This happens because in this type of polyculture business there are two nets in one unit or keep two types of fish.

The results of Table 2 above are the division of total production and land area then obtained the productivity of the unity of the area of each type of freshwater fish farming in Purwakarta Regency. In aquaculture activities, the floating net cage system has a land area of 220.86 ha and the total production in 2022 reaches 106,513.00 tons. The cultivation activities of the fast water pond system have a land area of 0.96 ha and a total production of 417.38 tons. The cultivation activities of the calm water pond system have a land area of 96.25 ha and a total production of 1,785.14 tons.

A total of 27 cultivators or as many as 90% of the total number of cultivators used as respondents had productivity based on land used ranging from more than 14.29 kg / m^2 to 20.40 kg / m^2. Meanwhile, the productivity range with the smallest cultivator quantity is in the range of less than 14.29 kg/m^2. In that range, there are 3 cultivators or as much as 10% of the total number of cultivators.

Table 3. Productivity unity of Karamba Floating Net cultivation business per commodity

Produktivitas (kg/m²)		
Tilapia	Carp	Patin
14.286	10.204	25.510

Source: Processed from Primary data (2023)

The results of the table 3 are a division of total production and land area then obtained productivity unity area of each type of fish. The area of tilapia enlargement is 7 x 7 m^2, while the enlargement of Goldfish and Patin Fish in the 2 coloring net is 7 x 14 m^2. A comparison of the productivity results of the broad unity of Patin and Tilapia farming businesses in KJA in a journal entitled "Analysis of Fish Enlargement Farming in Floating Net Cages (KJA) and Ponds in Jambi City" in 2020, is obtained the productivity of Tilapia and Patin Fish respectively of 11,875 kg / m^2 and 28.75 kg / m^2. The production of Tilapia and Patin obtained on an enlarged land area of 4 x 4 m^2 of 190 kg and 460 kg.

CONCLUSION

Based on the results of the study, it is known that the productivity of floating net caramba according to the broad union of Purwakarta Regency in 2022 is 482,265 tons / ha.

A total of 27 cultivators or as many as 90% of the total number of cultivators used as respondents, had productivity based on land used ranging from more than 14.29 kg / m^2 to 20.40 kg / m^2. Meanwhile, the productivity range with the smallest cultivator quantity is in the range of less than 14.29 kg/m^2. In that range, there are 3 cultivators or as much as 10% of the total number of cultivators. It can be seen that the productivity of Tilapia in cages 7x7 m^2 produces as much as 14,286 kg / m^2, Carp in cages 7x14 m^2 produce 10,204 kg/m^2, and Patin in cages 7x14 m^2 produce 25,510 kg/m^2. From the results of the assessment of Good Fish Farming Methods on fish farmers with the KJA system in Cibinong Village. Appropriate criteria include location, design and layout, equipment, feed, cleanliness of sites and facilities, harvesting and post-harvest, and workers. Criteria that are not yet appropriate include, water sources, preparation of cultivation containers, seeds, stocking solids, health management, water management, waste management, environmental management, training and documentation.

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