

## Description of fish cultivation and production results of fish farming group in Palembang City

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### Abstract

Indonesia has enormous fishery potential. The city of Palembang is one area where the government encourages the development of urban fishery businesses through the establishment of fishery groups. Until now, the topic of urban fisheries on cultivation methods and production results and farmers' income has not been studied much. The research aims to

- Describe the cultivation process in aquaculture groups in the Palembang City.
- Analyzing the production results of fish farming groups in Palembang City
- Analyzing the income of fish cultivating groups in Palembang City.

The results of this research are useful as a foundation for developing urban fisheries. This research was conducted in Gandus and Sukarami Districts, Palembang City. This study used a survey method with an unbalanced layered random sampling method. The number of samples is 100 people. The method of analysis using the scoring method, Spearman correlation statistical testing. This shows that in the future it is necessary to continue to increase the participation of fish cultivators in groups, improve group work programs to provide increased production capacity and fish cultivating businesses, increase the role of fishery extension workers, establish collaborative programs with stakeholders for fishery development in Palembang City.

**Keyword:** Fish Farming; Cultivation Group; Income; Production

### 1. Introduction

The fishery business is one of the most productive businesses but is still rarely in demand by both local and foreign investors, but in recent years, the fishery sector has begun to attract public interest. The high level of fishery products is due to the fact that the community is aware of the high nutritional content in fishery products. Fish farming is one type of business that has the potential to be developed in the city of Palembang.

Maritime Affairs and Fisheries (KKP) is to make Indonesia the largest producer of fishery products in 2015. Aquaculture is demanded to be the main contributor to increasing national fishery production by increasing the aquaculture production target by 353 percent during 2010-2014, that is, from 5.26 million tons to 16.89 million tons. [1] the success of the cultivation business activities is quite good and also drives the community to like eating fish in meeting nutritional needs. In the city of Palembang, fish farming is carried out in several systems, including: cultivation using cages, cultivation in ponds and ponds. Fish consumption has good prospects to be developed, because it is easy to cultivate and does not require a long time. The contribution to the development of the fisheries sector in an effort to improve the

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Indonesian economy can be used as a key issue considering the large potential of the fisheries sector, which will be utilized optimally. Millennial youth generally think that fish farming is tiring, boring and must be hot, and takes a long time to earn money.

The Musi River in Palembang City has the potential for local resource sectors that have the opportunity to develop better, namely aquaculture. This is because the sector in the last 10 years has shown an increasing graph. Fishery products that are widely cultivated are catfish, tilapia, gourami, catfish and carp. Freshwater aquaculture in Indonesia has the potential to be developed. Gandus District is the largest area in Palembang City which is included in the Minapolitan regional development program where residents carry out freshwater fish farming activities. The problem in this research is what is the role of the Fish Cultivation Group (Pokdakan) in Palembang City towards consumption fish needs in Palembang City. This study The aim of this study was to find out how much the production of fish farming was consumed by the fish farming group (Pokdakan) in Palembang City. It is hoped that the government and related agencies will pay attention to freshwater fish cultivators, especially in Palembang City who have joined the Fish Cultivation Group (Pokdakan).

## 2. Material and methods

This research was conducted in the city of Palembang, Gandus and Sukarami Districts. Data collection was carried out from July to September 2022. In implementing this method a list of questions was asked so that data could be obtained that might not be obtained by the observation method, including information about the past or plans for the future. The survey method is carried out by taking samples from the existing population. This method was carried out by submitting a list of questions in the form of a questionnaire as a means of collecting data and conducting interviews with fishery cultivation groups in Sukarami and Gandus Subdistricts, Palembang City, because these 2 Districts have the largest number of fishery cultivation groups. This method is carried out by submitting a list of questions in the form of a questionnaire as a means of collecting data and conducting interviews with Pokdakan. The researcher used this method because of the considerations in this study, the researcher has decided to take the sample taken, namely the head of the Pokdakan and five members of the cultivation group in each group. The sampling calculation can be done using the slovin formula with a 90% confidence level with a 10% error tolerance limit ( $e = 0.10$ ) with the following formula:

$$n = \frac{N}{Ne^2}$$

Information

n : Number of Samples

N : Total Population

E : Fault Tolerance Limits

The following is the calculation of cultivator group sampling based on the slovin formula:

$$N = \frac{200}{1 + 200(0,10)^2} = \frac{200}{201(0,01)} = \frac{200}{2,01} = 99,50 = 100$$

100 samples were taken and there were 20 groups, then  $\frac{100}{20} = 5$  so each 1 group taken 5 samples. Group members in Sukarami and Gandus Districts, Palembang City can be seen in Table 1:

**Table 1** Samples of pokdakan in Sukarami and Gandus sub-districts

Location	∑ Group	∑ Cultivation group	∑ sample cultivation group
Gandus	10	5	50
Sukarami	10	5	50

The samples taken in this study were 100 members of the cultivation group. each group each taken 5 samples.

### 3. Results and discussion

#### 3.1. Respondent Identity

The Pokdakan taken in this study were 1 person in accordance with the guidance that was fostered by extension workers in the city of Palembang. Cultivator identity in this study was classified based on age and level of education. Age and education are important indicators for success in trying to cultivate. In the table, you can see the identity of the Pokdakan grouped by age and level of education. Family dependents and length of time joining a Pokdakan.

Fish farming groups in Indonesia in the activities of raising and raising fish are carried out with several systems including fish farming in ponds, cages, rice fields and modern fish farming [2]

**Table 2** Distribution of respondent based on their characteristics

Respondent Identity	Sukarami		Gandus	
	Amount	%	Amount	%
Age (Years)				
23-32	12	23.52	6	12.00
33-42	24	47.05	21	42.00
43-53	12	23.53	17	34.00
54-64	3	5.90	6	12.00
Amount	51	100	50	100
<b>Education (Person)</b>				
SD	1	1.97	6	12.00
SMP	11	21.56	8	16.00
SMA	31	60.78	30	60.00
D3-S1	8	15.69	6	12.00
Amount	51	100	50	100
<b>Long Joined</b>				
3 - 4 (Years)	0	0	0	0
5-6 (Years)	19	37.26	25	50.00
7-8 (Years)	32	62.74	25	50.00
Amount	51	100	50	100
<b>Family Liability</b>				
0 -2 (people)	27	5.5	30	60.00
3 -5 (people)	21	41.17	20	40.00
6-8 (people)	3	5.88	0	0
Amount	51	100	50	100

The average pokdakan taken in this study belonged to the productive ages ranging from 23-64 years. Someone who has higher education tends to be more open-minded to be able to accept something new so that it will make it easier to try cultivation. Based on Table 1, it can be seen that the age and education level of pokdakan in Palembang City shows that the highest age of pokdakan is at the age of 33-42 with a value of 47.05%, which means that Pokdakan here are productive people who work well to provide good production results. Based on the education level of the respondents from the Pokdakan Kota Palembang, the education level for most fish cultivators was at the high school level, 60%. based on the length of time he joined the Palembang City Pokdakan, which was 7-8 years high. Based on the number of

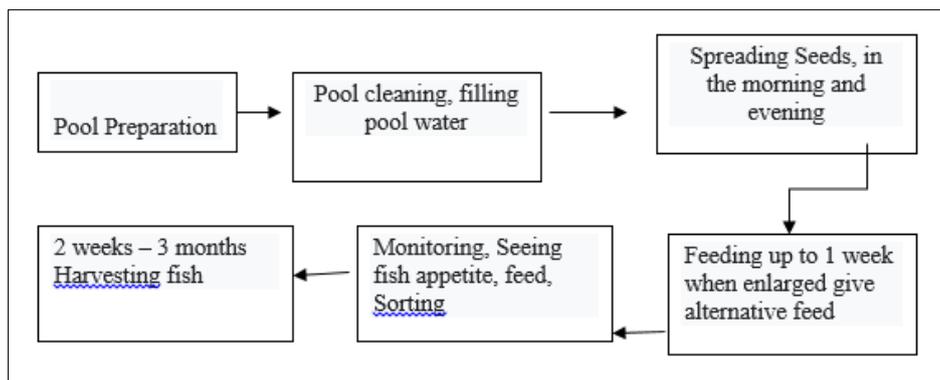
dependents of the Palembang City Pokdakan respondents, it can be seen that 27 people or 52.95% to 60.00% have 0-2 family responsibilities.

### 3.2. Description of fish farming business

Description of the fish farming business process, starting from pond preparation to post-harvest. CBIB fish farming business activities (good fish farming practices) are acceptable. The description of the cultivation business can be described as follows: Preparation of ponds for growing fish including drying and supply of water (3). The pond is dried under the hot sun for 3 days, then after that the bottom and walls of the pool are cleaned with a broom stick to clean the dried moss. Seed spreading. Before the seeds are sown, stocking the seeds should be done in the morning or evening or when the air is not hot. Growth monitoring includes monitoring the appetite of the fish, feed must be given as needed. Pests that often disturb is the presence of wild cats. Sorting fish Seeing the size that is ready in the pamanene. Harvesting is done by reducing the water. ponds, catfish will gather in kamalir and puddles, so they are easy to catch by using

### 3.3. Description of Fish Cultivation Process in Palembang City

Fish farming in Palembang City uses 3 cultivation systems (1) still water, (2) cages or floating nets, and (3) fixed nets



**Figure 1** Description of fish farming in Palembang City

#### 3.3.1. Preparation of Fish Farming Ponds

Pond bottom processing consisting of hoeing or plowing the pond bottom soil and leveling it. The walls of the pool are hardened by hitting them with wooden blocks to make them hard and dense so that no leaks occur. Refining the bunds for earthen ponds (covering the leaking parts of the pond). To provide shelter for fish (fish seeds) as well as to facilitate harvesting, ditches/kamalir and puddles are made to facilitate harvesting.

#### 3.3.2. Seed Spreading

Spreading the seeds should be done in the morning or evening or when the air is not hot. Before sowing them into ponds, the seeds are acclimatized first (temperature adjustment treatment) by adding pond water little by little into the seed carrier container. Seeds that have been acclimatized will automatically come out of the bag (container) and transport the seeds to a new environment, namely the pond. This means that the treatment is carried out on the surface of the pond water where the seed pods (bags) float on the water. The seeds are sown 3-5 cm in size according to the area of the rearing pond.

The fish farming group cooperates with the marine and fisheries service so that the fish farming group gets technological information [4].

#### 3.3.3. Monitoring fish growth

Growth monitoring includes monitoring fish appetite feed must be given as needed. The method of administration is based on the weight of the fish every 10 days. For example, a catfish weighing 50 grams requires 2.5 grams of feed (5% body weight) per fish. Then every 10 days take the sample, then weigh it and adjust the amount of feed given again. Two weeks before harvest, the percentage of feed is reduced to 3% of body weight. The feeding schedule is adjusted according to the appetite of the fish. The frequency of feeding small fish should be more frequent. Feeding times can be morning, afternoon, evening and night.

### 3.3.4. Feed Management

In addition to natural food, to accelerate the growth of catfish, it is necessary to provide additional food in the form of pellets. The amount of food given is 2-5% per day of the total weight of the fish spread in the pond. Feeding frequency 2-3 times every day. While the composition of artificial food can be made from a mixture of fine bran and trash fish in a ratio of 1 : 9 or a mixture of fine bran, rice bran, corn, chopped snails with a ratio of 1 : 1 : 1, the mixture can be made into pellets. Feeding is carried out continuously, the frequency of feeding is 3 times a day, namely in the morning around 07.00, during the day at 13.00 and at night 20.00 WIB. Fish farming groups can exchange ideas so that fish farmers can carry out good and correct ways of cultivating fish [5].

### 3.3.5. Disease Pest Control

Pests that often disturb is the presence of wild cats. This wild cat often eats catfish a day can eat 6-9 catfish. For the prevention of disease, papaya leaves and turmeric are mixed in the feed mixture that is made by yourself as an antibiotic and strengthens the body's resistance to disease. By forming fish farming groups, it can help people's income in aquaculture activities [6].

### 3.3.6. Fish harvest

Catfish will reach consumption size after being reared for 60 days, weighing between 100 grams per head with a length of 15-20 cm. Harvesting is done by reducing the water. ponds, catfish will congregate in kamalir and puddles, so they are easy to catch using waring or lambit. Catfish caught are collected in a container in the form of a sieve that is installed in a pond where the water continues to flow to rest before the fish are transported to be marketed.

The income earned from a business, the greater the income received, the more feasible a business is to be developed [7]

## 3.4. Business Analysis of Fish Cultivator Groups in Palembang City

The increasing demand for consumption fish, there are opportunities for fish farmers to meet the demand for consumption fish, and plan production quantities that will produce even greater output to obtain greater benefits. One of the fishery commodities that can answer this challenge is catfish cultivation which has good prospects for development, because catfish is one of the leading aquaculture commodities which is optimally developed on land, besides having market prospects, catfish is also has the advantage of being able to survive and be strong against pest attacks.

**Table 3** Variable Costs of Fish Farming Group

Respondent Group	Feed (Kg)	Price (Rp)	Amount (Rp)	Seed	Price(Unit) (Rp)	Amount (Rp)	Total Variable Cost (Rp)
Bina Khairi	30	4,500	135,000	2,800	300	840,000	975,000
Karya Mina	80	4,500	360,000	7,200	300	2,160,000	2,520,000
Bina Sejahtera	145	4,000	580,000	9,000	1000	9,000,000	9,580,000
Pulo Kerto Jaya	140	4,200	588,000	8,100	1000	8,100,000	8,688,000
Tambak Jaya	20	4,000	80,000	3,200	300	960,000	1,040,000
Nafs 313	140	4,000	560,000	7,200	800	5,760,000	6,320,000
Bintang	135	3000	405,000	10,500	2000	21,000,000	21,405,000
Al Baroqah	25	2,000	50,000	1,800	200	360,000	410,000
Tambak mas	15	3,500	52,500	2,100	200	420,000	472,500
Serasan	15	3,000	45,000	2,000	300	600,000	645,000

Aquaculture has a strategic value in the national economy because in addition to its contribution in supporting efforts to fulfill animal protein nutrition, providing employment and increasing sources of income for the community, aquaculture is also a source of foreign exchange for the country [8].

[9] on business effort, awareness and own desire to get income from cultivation has increased well.

Aquaculture is the cultivation of aquatic organisms, including fish, molluscs, crustaceans and aquatic flora which includes several forms of activity in the rearing process to increase production, such as regular stocking, culinary/feed gifts, protection based on predators and others [10].

Income and welfare of pond farmers, expanding employment opportunities and encouraging equal distribution of business opportunities [11].

**Table 4** Yields of the Fish Cultivation Group

Group	respondent	Harvest (Kg)	Price(Rp)	Amount
Bina Khairi	5	480	20,000	9,600,000
Karya Mina	5	400	20,000	8,000,000
Bina Sejahtera	5	500	22,000	11,000,000
Pulo Kerto Jaya	5	500	20,000	10,000,000
Tambak jaya	5	290	19,000	5,510,000
Nafs 313	5	460	22,000	10,120,000
Bintang	5	830	30,000	24,900,000
Al barokah	5	140	20,000	2,800,000
Tambak emas	5	160	20,000	3,200,000
Serasan	5	160	20,000	3,200,000
Total		3,920	213,000	88,330,000

Production value of pond aquaculture, marine aquaculture and pond aquaculture has a positive influence on the gross domestic product of the fisheries sector in Indonesia so that increasing aquaculture production can help the government increase regional income.

**Table 5** Costs of Fish Cultivation Groups in the District

Respondent	Number of Variables						Variable Cost (Rp)
	Feed (Kg)	Price (kg)	Amount	Seedlings (tail)	Unit (price)	Amount (Rp)	
Delta Bibit ikan Palmbang	500	4.500	2.250.000	10.000	400	4,000,000	6,250,000
Sahabat Fish	500	5.000	2.500.000	17.500	500	8,750,000	11,250,000
Mitra Kito	400	3.000	1.200.000	7.000	300	2.100.000	3,300,000
Mekar Sari	50	4.000	200.000	2.100	300	630.000	830,000
Telaga Buana	200	4.000	800.000	14.700	300	4,410,000	5,210,000
Satu Karya	50	2.000	100.000	7.700	800	6,600.000	6,260,000
Mufakat Jaya	40	1000	40.000	4.200	300	1,260.000	1,300,000
Ainul Yakin	500	2.000	1.000.000	14.000	300	4,200,000	5,200,000
Al Qomar	500	3.500	1.750.000	8.000	1400	11,200,000	12,950,000
Lucky n Lucy	600	5.000	3.000.000	17.500	1300	22,750,000	25,750,000
Rimba Gurami	500	4.000	2.000.000	5.000	1500	7,500,000	9,500,000

Farming costs are calculated based on the total value appropriate money spent by farmers for finance their farming activities such as costs production facilities, labor costs and costs others [12].

Aquaculture businesses can increase income and community relations/interaction. So it is hoped that by increasing the production of aquaculture, the community's income will increase, especially for areas that are currently still in a state of shortage. The fisheries sub-sector is a sector that has a fairly high role as a provider of food [13].

**Table 6** Yields of Fish Cultivation Groups in Sukarami District

Group	Harvest (Kg)	Price(Rp)	Amount (Rp)
Delta Bibit Ikan	800	21,000	16,800,000
Sahabat Fish	1.400	20,000	28,000,000
Mitra Kito	600	20,000	12,000,000
Mekar Sari	160	20,000	3,200,000
Telaga Buana	1.200	20,000	24,000,000
Satu Karya	500	32,000	16,000,000
Mufakat Jaya	250	19,000	4,750,000
Ainul Yakin	1.200	23,000	27,600,000
Al Qomar	600	32,000	19,200,000
Lucky n Lucy	1.800	23,000	41,400,000
Rimba Gurami	500	35,000	17,500,00
Total	9.010	265,000	210,450,000

The costs of fish farming in this study are the costs incurred during the cultivation process, the costs incurred include the cost of aquaculture equipment, feed, seeds. In order to produce ready-to-consume fish in the expected time, proper cultivation management is needed, but if the cultivation technique is wrong, it is possible that the rearing time will actually be longer than ordinary nurseries. Enlargement techniques in detail, namely regarding the preparation of ponds to be used in enlargement activities, how to get good quality seeds, maintenance according to correct cultivation techniques, structured feed management according to the number of stockings, and pest and disease management carried out as early as possible to support success in cultivation.

### 3.5. Production of fish cultivator groups in Palembang City

**Table 7** Fish Cultivation Costs in Palembang City

No.	Component	Jumlah
1	Fixed cost	
	Equipment depreciation (Rp/per year)	193.602.780
2.	Variable Cost	
	Feed (Rp/Kg)	640.627.500
	Seeds (Rp/Kg)	
	Total Cost (Per Production)	834.230.280

As the demand for consumption fish increases, there are opportunities for fish farmers to meet the demand for consumption fish, as well as plan production quantities that will produce even greater output to obtain greater benefits. The costs of the fish farming business in this study are the costs incurred during the cultivation process, the costs incurred include the cost of cultivation equipment. Detailed enlargement techniques, namely regarding the preparation of ponds to be used in enlargement activities, how to get good quality seeds, maintenance according to the technique

correct cultivation, structured feed management according to the number of stockings, and control of pests and diseases as early as possible to support success in cultivation. In detail, the cost of production of fish farming in the city of Palembang can be seen in Table .7

Based on Table 7, it shows that the fixed costs of fish production in the city of Palembang are Rp. 193,602,780 per production. The fixed costs include the costs of making ponds/warings, scoops, sorting equipment, scales, basins and the variable costs of fish farming in the city of Palembang are Rp. 640,627,500 of these costs consist of feed and seeds. The sum of the variable costs and fixed costs of fish farming in Palembang City is Rp. 843,230,280

### 3.6. Acceptance of fish cultivator groups in the city of Palembang

Cultivation Business Revenue is the amount of fish production produced multiplied by the selling price. Acceptance of fish farming business in the City of Palembang. See in table 8.

**Table 8** Average Revenue of fish cultivators in Palembang City

No.	Component	Jumlah
1	Fish Production (Kg/Per production)	60,050
2	Fish Price (Kg)	22,090
3	Revenue	1,326,504,500

Based on Table. 8 Data on average pokdakan receipts in the city that the results of fish farming production obtained are 60,050 kg with an average selling price of fish per kg of IDR 22,090 with revenues of IDR 1,326,504,500. This can be a challenge for the government and researchers so that fish production in the city of Palembang can produce even more fish [14].

### 3.7. Income of fish cultivator groups in the city of Palembang

The amount of fish farmer's income depends on production, selling price and production costs. Income. Income from fish cultivation can be seen in Table 9.

**Table 9** Average Income of Fish Farmers in Palembang City

No.	Component	Jumlah
1	Revenue (Rp/ Per production)	1,326.504.500
2	Total Fixed Costs and Variable Costs (Rp/Per production)	834,230,280
3	Income (Kg/Per Production)	492,274,220

The purpose of conducting a fish farming business is to get the profit or income desired by the fish farming business actor. Based on Table 9 above, it shows that the results of the analysis obtained are the average income of fish farming pokdakan in the city of Palembang Rp. 429,274,220. The amount of this income is obtained from the reduction between revenue and total fixed costs and variable costs.

Income is the amount of income earned by the community for their work performance in the period certain conditions, whether daily, weekly, monthly or yearly [15].

In order to produce ready-to-consume fish in the expected time, proper cultivation handling is needed, but if the cultivation technique is wrong, it is possible that the enlargement time will actually be longer than that of ordinary catfish. Dumbo catfish enlargement techniques in detail, namely regarding the preparation of ponds to be used in enlargement activities, how to get good quality seeds, maintenance according to correct cultivation techniques, structured feed management according to the number of stockings, and pest and disease management carried out as early as possible to support success in cultivation.

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#### 4. Conclusion

Based on the research that has been done, the following conclusions can be drawn: fish cultivator groups. With this catfish cultivation, the community gets both main and side businesses, so they get additional income and can significantly improve the economy of the cultivator's family in order to increase the cultivator's own income to meet their daily needs. production in order to further increase in terms of quality and quantity.

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#### Compliance with ethical standards

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##### *Disclosure of conflict of interest*

There is no conflict of interest

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