



# Profile Analysis of Milkfish Nursery Pond Culture in Cibuaya District, Karawang Regency (Case Study in Cemarajaya Village)

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## Authors' contributions

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## ABSTRACT

Pond aquaculture is an alternative aquaculture activity that has high economic value and can be developed in coastal area. The purpose of this study was to describe the profile of milkfish pond aquaculture in Cemarajaya Village, Cibuaya sub-district, Karawang Regency. The method used is a case study with quantitative analysis and descriptive data analysis. The sampling technique used Purposive sampling with 30 respondents. The result show the first for characteristic of cultivation majority are the male, range of age in 50-54 years with an elementary school of education level and then majority of cultivation have been doing this cultivation 2-6 years. Second for general condition majority cultivation 1-5 Ha area, they buy the fish seed IDR 25-30/fish with transportation cost in IDR 300,000-500,000. The cultivation can be stocking from 300,000 – 500,000 fish/Ha/cycle with cost of fertilizer in IDR 225,000-550,000 and cost probiotic in IDR ≤100,000. The production in cultivation can be 190,000 – 255,000 fish/Ha/cycle which is selling at a price IDR 100-200/fish. The labor can be have 10% from production as a cost of labor. These results indicate that the cultivation of milkfish nursery ponds in the Cemarajaya village can still be improved in order to get maximum production results, because the current production results are still below existing standards.

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## 1. INTRODUCTION

Indonesia is an area that has a water area of about 6,315,222 km<sup>2</sup> and has as many as 13,466 islands [1]. Indonesia also has a large area of agricultural land and coastal areas. The available land area and a favorable climate make the territory of Indonesia suitable as a place to cultivate various types of fish and shrimp. The abundance of marine products in Indonesia can generate large income for the company, but the more fishing activities will have a negative impact on the availability of fish in nature. To overcome these problems, aquaculture can be used as an alternative that can be chosen because pond aquaculture is an alternative that has high economic value and can be developed in coastal areas.

Pond is one type of brackish water aquaculture habitat located in coastal areas. There are three systems commonly used in aquaculture, namely traditional (extensive) system, semi-intensive system and intensive system. The difference in that system are fish stocking density, increase in feeding and other inputs [2].

Milkfish (*Chanos chanos*) is one type of fish that is quite widely cultivated in Indonesia. Milkfish has a healthy source of protein because the protein contained in milkfish does not contain cholesterol, besides milkfish is also of high economic value, so it is not surprising that many people are trying to cultivate milkfish in ponds aquaculture for their business.

Karawang regency is regency that makes Milkfish as a leading commodity of pond aquaculture. According to data from the recapitulation of leading commodities, in 2019 the number of milkfish production reached 19,722.02 tons/year. The production increased compared to milkfish production in 2018 [3].

Cemarajaya Village is a village Located in karawang regency. The people in this village have a main livelihood as milkfish nursery cultivators. In 2021 production of milkfish from nursery aquaculture will reach 126 fish/year. This is the main attraction for this research so, the purpose of this study was to describe the profile of milkfish pond aquaculture in Cemarajaya village, Cibuaya sub-district, Karawang regency.

## 2. METHODOLOGY

The method used in this study is case study. Case studies is a scientific series that is carried out intensively, in detail, and in depth about a program, event, and activity, either at the individual, group of people, or institution or organization level to gain in depth knowledge about the event [4]. This research was conducted in Cemarajaya Village, Cibuaya sub-district, Karawang regency.

### 2.1 Types and Sources of Data

The types and sources of data used are primary data and secondary data. Primary data comes from direct interviews with respondent using structured questionnaires. Secondary data comes from related agencies such as the department of Marine Affairs and Fisheries of Karawang Regency, as well as other data sources that have been published. Survey and data collection of study was carried out from March 2022 to June 2022.

### 2.2 Sampling Technique

The sampling technique used in this study is purposive sampling. Purposive sampling is a sampling method based on certain considerations such as population characteristics or previously known characteristics [5]. The criteria for respondents selected in the study are:

1. Cultivators who carry out of manage milkfish nursery culture ponds.
2. Have a minimum of 1 year cultivation experience.
3. Have a minimum land area of 1 Ha.

The samples taken in this study were 30 milkfish nursery cultivators in the Cemarajaya village, Cibuaya sub-district, karawang regency.

### 2.3 Data Analysis

This study uses quantitative analysis and descriptive data analysis. The quantitative analysis is used to describe the characteristics of cultivators and general condition of milkfish nursery cultivation in Cemarajaya Village, Cibuaya sub-district, Karawang regency. The data obtained from questionnaires and interviews which is processed using numbers to facilitate

the analysis process. Quantitative data are presented in the form of diagrams and tables and then analyzed descriptively.

### 3. RESULTS AND DISCUSSION

#### 3.1 Characteristics of Respondents

Respondents of cultivators in Cemarajaya village are male with 100% or equal to 30 people. This is because cultivation activities require stronger energy because almost all of the activities are carried out in ponds [6]. This is in accordance with the results of research that has been regarding the gender characteristics of farmers. The study obtained the results that men dominated the work as much as 83,5% of the sample obtained [7].

Based on the age majority of cultivators are aged 50-54 years with 37% or 11 respondents. Between 15-60 years is a productive age. This means that most respondent are in the productive age because they are in the category of productive age [8].

Based on level of education the respondents in this study showed that 77% were had an elementary school. This show that the respondent have a lower of education. The low of level education obtained will lead to the long application of modern technology because the education sector has a major role in shaping the ability of a developing country to absorb modern technology and develop production capacity in order to create sustainable growth and development [9].

Based on the long of work experience majority respondents are in the category of 2-6 years with a 26% or 8 respondents. This show that the respondents have been doing this work long enough so that they already have the skills to carry out cultivation activities. According to theory, work experience is closely related to the skills they have. The longer they try to learn in a business field then they will have higher skills [10].

#### 3.2 General Condition of Milkfish Nursery Culture

##### 3.2.1 Land area

The land area for cultivation activities owned by cultivation majority ranges from 1-5 Ha with 80% or 24 respondents. The area of land will affect

the amount of production produced. Based on the theory, high land area will result in high production, low land area will result in low production [11].

##### 3.2.2 Fish seed source

Milkfish seed for cultivation activities in Cemarajaya Village come from Bali Island. This is because milkfish seeds from Bali have good quality and affordable prices. In addition, the Bali Island is also a major producer of milkfish seeds in Indonesia. Cultivators buy the fish seeds collectively with prices ranging IDR 25,00-30,00/fish seeds. The difference of price is caused by the availability of seeds in the market.

##### 3.2.3 Transportation cost of fish seed

The fish seeds used in cultivation are sent by supplier using land routes. Cultivation only incur transportation costs to pick up the fish seeds send by the supplier to the Karawang regency. Majority respondents incur transportation costs in range IDR 300.000 – 500.00,- with 83% or 25 respondents. Based on the interview result of respondents, the transportation costs of fish seeds can be seen in Table 1.

**Table 1. Transportation cost**

Transportation Cost (IDR/Ha/cycle)	Frequency	Percentage
300,000 – 500,000,-	25	83%
550,000 – 750,000,-	4	13%
>750,000,-	1	3%
<b>Total</b>	<b>30</b>	<b>100%</b>

Difference of price is caused by the availability of seeds in the market.

##### 3.2.4 Stocking density of fish seeds

The stocking density of fish in nursery cultured ranges from 300,000- 500,000 fish/Ha./cycle with an average of 348,333 fish/Ha/cycle. This stocking density depends on the size of the pond and the capital owned by the cultivation.

##### 3.2.5 Feed of fish seeds

Feed is a very important factor in aquaculture. In this nursery cultivation, the main feed given is natural food in the form of natural food. This

natural food will meet the needs of feed for 4-5 weeks. Then if the fish stock is still available in the pond after 5 week, there will be additional feed in the form of pellets or expired bread. The pellets are Grobes, Fengli, Hi-Pro-vite, and Sinta brands. As for the price of additional feed range from IDR 3,000-20,000/kg.

### 3.2.6 Cultivation fertilizer

The milkfish nursery cultivation in Cemarajaya Village use urea fertilizer. Urea fertilizer is used to grow the natural food. The price of urea fertilizer ranges between IDR 3,000-3,500/kg. The majority of respondent spend for fertilizer IDR 150,000-500,000,- with percentage 57% or 17 respondent. The cost of fertilizer depends on the stocked of fish because this fertilizer is a source for the growth of natural feed that will be used during the cultivation of fish nursery is carried out.

### 3.2.7 Cultivation probiotics

Probiotics used in milkfish nursery culture in Cemarajaya village are EM4, Ursal and Lodan brand. The use of probiotics are uses only one of the three type. It is use depends on the stock and cultivation needs. For the price of each probiotic used is for EM4 IDR 23,000; Ursal IDR 42,000 and Lodan IDR 20,000. Based on the study majority spend for probiotics in IDR ≤100,000,-

with percentage 83% or 25 respondents. The cost of probiotic depends on the amount and type of probiotic used. The probiotics cost can be seen in Table 4.

### 3.2.8 Production of cultivation

The production of milkfish nursery cultivation in Cemarajaya village ranges from 120,000 – 315,000 fish/Ha/cycle. In one year the cultivation of this nursery can have 6-10 cycle. In one cycle has a maintenance period of 3-6 weeks. The amount of production depends on the area of land and the stocking density of the cultivation density. The majority of respondents can produce 190,000 – 255,000 fish/Ha/cycle with percentage 57% or 17 respondents. The results obtained are still below the existing standards. Based on the standard, the production obtained should be at 300,000 – 400,000 fish/Ha [12].

### 3.2.9 Selling price of fish seeds

The selling price of milkfish from nursery cultivators to dependents cultivators of the size they need. For sizes 3-4 cm with a cultivation period of 1-2 weeks where this size is sold at a price of IDR 100,00/fish. For the size of 5-6 cm with 3-4 weeks of cultivation is sold at a price of IDR 150,00/fish. The last for size 10-12 cm with a cultivation period of 5-6 weeks is sold at a price IDR 200,00/fish.

**Table 2. Stocking density of respondents in cultivation**

Stocking Density (Fish/Ha/cycle)	Frequency	Percentage
300,000-350,000	24	80%
400,000-500,000	6	20%
<b>Total</b>	<b>30</b>	<b>100%</b>

**Table 3. Cost of feed fish**

Cost of Feed Fish (IDR/Ha/Cylce)	Frequency	Percentage
≤1,000,000,-	21	70%
1,050,000– 2,000,000	1	3%
2,050,000– 3,000,000	2	7%
>3,000,000,-	6	20
<b>Total</b>	<b>30</b>	<b>100%</b>

**Table 4. Probiotics cost**

Probiotics Cost (IDR/Ha/cycle)	Frequency	Percentage
≤100,000	25	83%
>100,000	5	17%
<b>Total</b>	<b>30</b>	<b>100%</b>

### 3.2.10 Labor of cultivation

In the nursery cultivation in Cemarajaya village, labor is divided into 3 activities, namely 1). 1-2 people for pond preparation stage; 2). 1-2 person for the fish rearing stage; 3). 2-3 people for the harvesting stage. In this workforce need, the majority of cultivators also participate in each stage of cultivation, especially at the maintenance stage. For the provision of wages to workers in maintenance, they are paid with 10% of the production in cycle. Meanwhile, for the provision of wages to workers in the harvesting stage of IDR 50,000 – 100,000 /ten thousand fish/cycle.

## 4. CONCLUSION

This paper explain about profile of milkfish nursery pond in Cemarajaya Village, Cibuaya sub-district, Karawang regency. This profile explain about characteristic of cultivators and general condition of milkfish nursery culture. The result for characteristic of cultivators show based on the gender the respondents are 100% male or 30 respondents are male. Based on the age majority are in productive age with most percentage 37% in 50-54 years. Than based on the level of education 77% they are had an elementary school. The las is characteristic based on the long of work experience majority they are in 2-6 years with percentage 26%.

The result for general condition of milkfish nursery culture 80% respondent have a land area 1-5 Ha. The cultivator buy fish seed in Bali island with prices range IDR 25.00 – 30.00/fish and the transportation cost for fish seed 83% incur the transportation in range IDR 300,000 – 500,000. for the stocking density majority cultivation are stock in 300,000 – 350,00 fish/Ha/cycle with persetage 80%. For feed they are used a natural food and in the additional feed from pellets or expired bread. The cultivation fertilizer 57% respondent spend IDR 150,000 – 500,000 and for the cultivation probiotict 83% they are spend in IDR ≤100,000. the cultivators in Cemarajaya village majority can produce 190,000-255,000 (57%) and then they can selling the product in rage IDR 100-200/fish. The last for cost of labor cultivation. The cultivator can pay the labor in the rearing stage with 10% from production in one cycle meanwhile, for the labor in harvesting stage the cultivator can pay of IDR 50,000 – 100,000 /ten thousand fish/cycle.

## 5. IMPLICATIONS OF THE STUDY

The results of this research can be used as information and can be developed by parties related to this research. First expected form the researches is for the readers it can be a new insights and knowledge expecially about profile nursery pond. The second for the relevant agencies this researches can be used as input for the development and improvement of milkfish nursery culture. The last is for the student this researches expected to provide information to studies science related about analysis profile of nursery pond and socio-economic.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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