



Disparity Analysis of Fish Cultivators Running Water System Pond in Tanjungsiang District, Subang Regency

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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

The research of disparity analysis of fish cultivators running water system pond in Subang Regency has been carried out in April 2019 until December 2020. This study aims to determine the level of budget and analyze the level of inequality in Tanjungsiang, Subang Regency based on characteristics of Central Statistics Agency (BPS) in 2020. The method used in this research is qualitative and quantitative method. Information and data are collected by primary and secondary data that obtained by questionnaire and from relevant agencies. Processing data used the Gini Ratio analysis. The results showed that the average expenditure of the population according to the monthly per capita welfare level in Subang Regency was Rp. 1.228.740. The level of income gap of running water system pond fish cultivators in Tanjungsiang District, Subang Regency during the analysis period from 2018 to 2019 is at a high level gap because it is more than 0.5. Based on the Gini coefficient calculation, a value of 0.901 is obtained.

Keywords: Disparity; subang; cultivators; income; running water system pond.

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1. INTRODUCTION

The gap between regions is a development problem faced by developing countries including Indonesia. This is due to differences in the content of natural resources and differences in demographic conditions in each region. This difference makes the ability of a region to encourage the development process also to be different. Therefore, in each region there are usually developed regions and underdeveloped regions [1,2].

Freshwater aquaculture activities in West Java are one of the most critical sub-sectors in producing fishery products. The most significant freshwater fish farming production in West Java in 2009-2013 was carp, which was 786,642 tons. Goldfish production always increases every year, but in 2013 there was a decrease in carp production. This description shows that several factors influence goldfish production. Goldfish production in West Java comes from cultivation activities carried out in floating net cages, calm water ponds and running water ponds, and rice fields. One of the districts contributing to the relatively sizeable freshwater aquaculture production in West Java is Subang Regency [2,3].

One of the potentials of freshwater aquaculture in Subang Regency is the running water system pond. The number of fish cultivators in the running water system pond in Subang Regency from 2009-2013 increases. Subang running water ponds that are scattered in several areas in Subang keep goldfish. Jetted ponds must have many springs and irrigation channels to help increase the production of freshwater cultivation. The process of raising goldfish in fast water ponds is different from goldfish in still water ponds. The level of density is different compared to a calm pool. Jetted water pools generally have a higher density level than calm water pools [2,3].

Subang is one of the regencies that has considerable opportunities in economic development, because in addition to having great potential for human resources and natural resources, it is also supported by the availability of information and institutional facilities and infrastructure as well as relatively complete information. However, despite having complete opportunities and potentials, from the perspective of economic development, there are some indications that Subang still needs significant efforts to accelerate the pace of

development and economic growth. Subang Regency has 30 sub-districts with different economic, demographic and natural resource characteristics. The high per capita income does not occur in all areas in Subang.

In addition, the population is not evenly distributed throughout the Subang area, there are still several areas that dominate other areas. One of the most visible gaps is the gap that occurs in Subang, especially in the southern region. The condition of the South Subang gap can be seen from how Subang achieves the overall welfare of the community. One indicator of welfare is seen from the distribution of the Gross Regional Domestic Product (GDP) of each sub-district in Subang as a whole. Therefore, the implication of the importance of handling inequality in the South Subang region is to achieve people's welfare and continue to strive to improve the standard of living of the people for the better.

2. MATERIALS AND METHODS

2.1 Location and Time of Research

The research location includes Tanjungsiang District, Subang Regency, West Java. This research was conducted from April 2019 to December 2020.

2.2 Types and Source of Data

The types of data used in this research are qualitative data and quantitative data. The qualitative data in this study were obtained from filling out the questionnaire. The quantitative data were in the form of the average value of population expenditure according to the level of per-capita welfare and the average per capita expenditure per month of Subang Regency. Based on the acquisition aspect, the data obtained are categorized as non-experimental data, which means data that is not an experiment.

Sources of data obtained in this research include primary data and secondary data. Primary data obtained from the questionnaire with purposive sampling on fish cultivators and non-fish cultivators. Secondary data also used in this study is data for 2014-2019 in Tanjungsiang District, Subang Regency obtained from BPS Subang Regency.

2.3 Sampling Method

The sampling carried out in this research was purposive sampling because the respondents were deliberately chosen at the intended target or not randomly (random). The selection of respondents is taken with the consideration that respondents can understand and fill out the questionnaire well [4].

The sampling in this research is by selecting sub-groups from the population in such a way that the selected sample has a representative character of the population with characteristics based on experience. Respondents as many as 40 people with The criteria for respondents are as follows :

1. Respondents are Tanjungsiang people who work as fish cultivators in running water system ponds
2. Respondents are Tanjungsiang people who are the owners of the running water system pond fish farming business

2.4 Analysis Method

2.4.1 Disparity analysis

The Analysis of the disparity of opinion is carried out by calculating how much the disparity of fishermen's income in this study uses under the Gini coefficient. The Gini coefficient is expressed in the form of a ratio whose values are 0 and 1. 0 is used to indicate perfect equality where all values are equal while the value of 1 shows the highest inequality, namely one person controls while the other is equal nil.

The Gini Coefficient Formula, according to [4,5], is as follows:

Gini Ratio

$$GR = 1 - \sum_{f=1}^n fpi \times (Fci + Fci - 1)$$

Information:

GR = Gini Ratio / Gini Ratio

fpi = Frequency of population in the i-th income class

Fci = Cumulative Frequency of total income in the i-th income class

Fci-1 = Cumulative Frequency of total income in income class to (i-1)

3. RESULTS AND DISCUSSION

3.1 Geographical Conditions in Tanjungsiang District, Subang Regency

Geographically, Tanjungsiang District is located between 107°32'-107°55' East Longitude and 6°11'-6°49' South Latitude. Tanjungsiang is one of the Districts in South Subang Regency. The district capital is in Sirap Village. Tanjungsiang District has an area of 67.16 KM2 or 3.27 percent of the total area of Subang Regency. Tanjungsiang District is located in the southern part of Subang Regency, its territory is bordered by Cijambe District in the north, Sumedang Regency in the east, West Bandung Regency in the south, and Cisalak District in the west [6,7].

Tanjungsiang District consists of ten villages, namely Buniara, Tanjungsiang, Cikawung, Cimeuhmal, Sirap, Kawungluwuk, Cibuluh, Sindanglaya, Rancamanggung, Gandasoli villages. The topography of Tanjungsiang District is mountainous with a height of 403 meters above sea level.

3.2 Population in Tanjungsiang District, Subang Regency

Problems in the population sector are essential issues in planning and evaluating the results of development implementation. Various population indicators can be used to see the condition of the area for other indicators.

Tanjungsiang District consists of 10 villages inhabited by 16,565 men and 16,188 women, so the total number is 32,753 people [6,7]. The highest population density level is Sirap Village, 1,078 people per Km2, and the lowest population density is Rancamanggung and Gandasoli Villages, with six people per Km2 [6,7].

3.3 Characteristics of Respondents

Sampling in this study was conducted in Tanjungsiang District in Subang Regency. Where the sample used as many as 40 people. This section will discuss the characteristics of respondents based on age and income.

3.3.1 Characteristics of respondents by age

The age of fishermen is one of the factors that affect the level of income of fishermen [8]. The productive age of fishermen ranges from 15-64 years which is the ideal age for workers.

Productive period, in general, as you get older, your income will increase, which depends on the type of work you do. A person's physical strength to carry out activities is closely related to age because when a person's age has passed the productive period, his physical strength decreases so that his productivity decreases and his income also decreases. This also applies to fish cultivators. The characteristics of the age level of the sample cultivators in this study are shown in the following table.

Table 1 Distribution of respondents by age level in Tanjungsang district, Subang regency

Age group (Years old)	Quantity	Presentage (%)
20-29	5	12,5
30-39	8	20
40-49	14	35
50-59	8	20
>59	5	12,5
	40	100

Source: Primary Data (processed)

According to Table 1, it can be seen that the age level of cultivators begins at the age of 20 years. The distribution of respondents according to the age level of the largest cultivators in Tanjungsang District, Subang Regency is in the age interval of 40-49 years with the number of cultivators of 14 people or 35 percent. Meanwhile, according to the age level of the smallest cultivators, the distribution of respondents is in the age of 20-29 and >59 years with the number of cultivators of each five people or 12.5 percent.

3.3.2 Characteristics of Respondents Based on Income

The income received by farmers can be increased by managing and utilizing marine resources effectively and efficiently in the production process. The amount of income of cultivators is determined from the use of the

factors that influence it. The income of one cultivator with other cultivators certainly varies depending on the productivity of the cultivator itself. The following table shows the distribution of respondents according to the level of income received by farmers.

Table 2. Distribution of respondents by income of cultivators in Tanjungsang Subang district

Income (Rp)	Quantity	Percentage (%)
<5 M	7	17,5
5-10 M	22	65
10-15 M	6	15
15-20 M	3	7,5
>20 M	2	5
Jumlah	40	100

Source: Primary Data (processed)

According to Table 2, the income level of the largest cultivators is more than 20 million rupiahs, totaling two cultivators. The total percentage is 5 percent. At the same time, the lowest level of income is less than 5 million rupiahs, which is seven cultivators or with a percentage of 17.5 percent. Then the income of 5-10 million is the income with the most significant number of cultivators, which is 22 people or with a percentage of 65 percent. The factors that influence the income of pond fish farmers based on [9] include land area, feed, seeds and medicines that have a simultaneous effect.

3.4 Gap Analysis of Farmers' Income in Tanjungsang Sub-district, Subang Regency

The level of the farmer income gap in Tanjungsang Sub-district, Subang Regency uses Gini Ratio analysis. From the calculation of the Gini ratio, the income of the cultivators in Tanjungsang District can be described as follows.

Table 3. Gap index of cultivators income in Tanjungsang District

Expenditure group	(fc)	(Fc)	Fc-1	Fc+Fc-1	fp*(Fc+Fc-1)
352,319 - 419,116	0,0010783	0,00108	0	0,00108	0,00061
611,04 - 627,552	0,00069234	0,00177	0,001078	0,00285	0,00065
860,053 - 959,717	0,00039397	0,00216	0,001771	0,00394	0,00035
1196553 – 1429477	0,45344163	0,45561	0,002165	0,45777	0,03219
2186510 – 2790335	0,54439375	1	0,455606	1,45561	0,06485
				Gini index	0,901

Source: Primary data (processed)

According to Table 3. the Gini coefficient value is 0.901. This score shows that the level of income inequality of cultivators is in the high category. This reality happened to cause the Gini coefficient score to be above 0.5. So, based on these results, it can be concluded that there is a high-income inequality between heavy water pond fish cultivators in Tanjungsiang District, Subang Regency. The research conducted by [10] researched in Juntinyuat District, Indramayu Regency on gillnet fishing gear. The study results indicate that the income inequality between fishermen of payang fishing gear and Trammel net in Juntinyuat District, Indramayu Regency during the analysis period 2015 to 2019 is at a high-level gap it is more than 0.5 with a Gini ratio value of 0.519.

This situation is in line with [11], who conducted a study entitled Analysis of the inequality of income distribution of fishers in Buhias Village, East Siau District, Southeast, a research method using the Gini Ratio. The results showed that the income of the sample fishermen in Buhias Village was quite varied and tended to be different. Fishers who use fishing fleets KM 7-10 GT have a high average income, while fishers who use boat fleets without engines have a low average income. The level of income inequality of fishers in this study is in the high category with a Gini ratio value of 0.531.

4. CONCLUSION

During the period 2014 to 2019 the level of income in Subang Regency experienced an increase in income. The level of income gap of running water system pond fish cultivators in Tanjungsiang District, Subang Regency during the analysis period from 2018 to 2019 is at a high level gap because it is more than 0.5. Based on the Gini coefficient calculation, a value of 0.901 is obtained, which is above 0.5. This shows that there is a high level of inequality. This is similar to the research conducted by [10] who conducted research in Juntinyuat District, Indramayu Regency on gill net fishing gear. The results showed that the income inequality between fishermen of payang fishing gear and Trammel net in Juntinyuat District, Indramayu Regency during the analysis period 2015 to 2019 was at a high level gap because it was more than 0.5 with a Gini ratio value of 0.519.

The high level of income disparity for freshwater fish cultivators in Tanjungsiang District, Subang Regency, means that the empowerment of poor

areas, which are identified with relatively smaller incomes than others, should become a priority for the government so that it can trigger the growth of the area thereby reducing inequality. Improvements can be made by managing a quality population as well as increasing the participation of the government, local stake holders, and capital owners in regulating the agricultural and industrial sectors so as to increase regional income.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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