An Analysis of Income Distribution of Plus Traditional Fish Farmer in Pasuruan District, East Java

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Abstract: This study aims at analyzing the income distribution of plus traditional fish farmer in Pasuruan district in East Java province. This research is conducted in Bangil sub-district of Pasuruan District by considering the fact that this area is one of the biggest traditional fish farm areas in Pasuruan district. There are forty plus traditional fish farmer who become our informant in this study. The research finding shows that there is an income gap among the forty fish farmer. The average income of the plus traditional fish farmer is five million rupiahs per month. There are 28 fish farmer (70%) who earn 5,290,000 rupiahs. Meanwhile, other eight fish farmer (20%) earn 4,950,000 rupiahs per month and the remaining four fish farmer (10%) make 4,740,000 rupiahs per month. There are three factors affecting the income distribution of the plus traditional fish farmer, namely the number of working family members, the knowledge of the fish farmer about the plus traditional fish farm business, and the price of product produced by the plus traditional fish farm business.

Keywords: Income Distribution, Fish Farmer, Plus Traditional Fish Farm Business, The Number of Working Family Members, The Knowledge of The Fish Farmer, The Price of Product Produced.

INTRODUCTION

Indonesia is a country whose fishery factor is quite potential. The abundant sea resource is able to make big income for the country. It is no wonder that Indonesia is well-known as a maritime country as most of the Indonesian people work as sailors or seamen. However, the uneven area distribution makes the distribution of the fishery sector uneven, too. This uneven distribution is related to the science of regional economic. The science does not study the individual activity, yet it analyzes a region or part of the region as a whole. It also sees the area with its potential and learns how to create policies to accelerate the economic growth of the area (Nasikh, 2016; Iswanto, 2015; Nasikh, 2017a; Nasikh, 2017c).

The fishery sector plays a significant role in the economic development of a country as many developing countries count on their fishery sector. In order to improve the life of their citizens, the country needs to

plan their fishery sector. One of the ways to improve the life of the citizen is by improving the production of the fishery business, so they can earn more income. Increasing the price of the fish farm product is the implication of the increasing production cost. Every rising output will not be profitable when the production cost increases as well. Therefore, the fish farm business output is one of the aspects affecting the income earned by the plus traditional fish farmer in Pasuruan district and East Java. The higher income of the citizen will affect the family welfare as well as the economic growth in Pasuruan district (Nasikh, 2017b).

Pasuruan district has been relying to their fishery sector to contribute to their Gross Domestic Product. Consequently, the surplus of the plus traditional fish farm business is able to fulfill the needs of other regions and export the product to other countries. The abundant prawn harvest is distributed to some areas in East Java and other countries. The aim of export is to add the country's income so that the government can use it to subsidize the fish farmer in Pasuruan district and other regions in the country. This subsidy is beneficial to help the fish farmer in the fishery business. In other words, the fishery sector, particularly the plus traditional fish farm business, plays an important role to afford the reserve of income.

Pasuruan district is one of the areas in East Java that has a lot of potential sectors from its highland to lowland. Some sub-districts in the coastal areas of Pasuruan district are generally employed to be the aquaculture businesses, such as fish farm. From time to time, the production of fish and prawn increases as shown in table 1.

Table 1
The Production of Fish farm Fishery of Pasuruan District

Year 2013		*Year 2014*		*Year 2015*	
Total	10.674,90	Total	11.364,93	Total	11.386,41
Production (tons)		*Production (tons)*		*Production (tons)*	
Amount (Rp)	191.576.158,87	Amount (Rp)	229.064.945,96	Amount (Rp)	276.786.467,51

Data source: Central Bureau of Statistics (data is processed) in 2017.

This study aims at analyzing the income distribution of the fish farm farmer in Pasuruan district by considering the economic sector, the source of income (the employed resources, such as labor and land), and the characteristic of knowledge to manage the plus traditional fish farm business.

LITERATURE REVIEW

The Income Distribution Theory

According to the modern economy, the distribution focuses on the post-production process, namely the production process of every project in the form of money or value. Then, the result is distributed to the components that play role in the production (Nofrianto, 2009; Sultan and Jamzani, 2010). The components include the salary, interest, cost, and profit. Meanwhile, based on the socialist economics' point of view, the principle of the income distribution is based on what is applied by the citizen represented by the nation. It is not determined by the market. The country plans and implements the distribution policy with its component, namely wage, salary, interest, and renting cost. The individual right in the socialist economic system is often neglected for the sake of public interest. All wealth and income have to be evenly distributed to all people regardless the individual contribution and their participation in the production process.

The Income Gap

The income gap is a condition in which the income in the society is not evenly distributed (Dewanto and Agus, 2014). There are some benchmarks to measure the income gap, namely the development level, heterogeneity of the ethnic, and the gap regarding to the failure of the dictator and government to respect the property rights. Consequently, the income gap will inhibit the growth. This is because the gap can cause the high redistribution policy. One of the measurements to calculate the gap in a region is called Gini Ratio. This ratio can be used to calculate the negative income. This is one of the characteristics that is not owned by other gap measurements. Furthermore, this ratio is easy to observe, analyze, and it has a strong theoretical basis.

Factors Affecting the Income Distribution

According to Iswanto. (2015), Nasikh (2016), Kalalo, *et al.* (2016), Makmur, *et al.* (2011) some factors that affect the income distribution are as follows.

(a) *The number of family members who work to earn money:* The working family members are able to increase the family income of the plus traditional fish farmer in Pasuruan district, East Java. The more family members work, the higher the income earned by the household (Nasikh, 2013; Nasikh, 2014)

(b) *The knowledge possessed by the business actor:* The better the knowledge about plus traditional fish farm business owned by the fish farmer, the more successful the business actor in running their fish farm business.

(c) *The price of product:* When the price of the product is high, the profit made by the business actor is also big and vice versa.

(d) *Economic growth:* On one side, the effect of the income gap is good for the economic growth as it reduces the cost to mobilize the capital. On the other side, it gives a bad impact to the economic growth because there is an obstacle for the low class of the society in the capital market. It also reduces the demand of the financial institutions required for the long-term economic development.

(e) *The development of financial sector:* The capital market also gives some effects to the income. Some theories propose different hypotheses about the financial development and the income gap. Some of them argue that the financial development is pro-poverty (Agung and Edy (2011), Dewanto and Agus (2014), Kuncoro (2010)). However, the initial stage of the financial access to the financial service is limited to the old actor, thus, it can increase their income. It is relevant to the income of the low class of society. Another model proposes the inverted non-linear, the U-shape relationship, and the income distribution.

(f) *Inflation:* Inflation would have the strong redistribution effect which can be positive (by its effect on the individual income) and negative (by the progressive tax system). There is an argument saying that the high inflation inflicts the low and middle class of society rather than the high class of society because there is surplus to the financial market and these people likely to protect their wealth from the inflation.

(g) *Government expenditure:* The government expenditure is also one of the factors affecting the income distribution. The income gap can increase and decrease alongside the government expenditure.

If most of the tax redistribution and transfer system are towards the poverty, the government expenditure will make the gap bigger. However, it can have contrasted effect if the government expenditure is not developed (it means it is not pro-poverty). The cross-country study finds out that the public sector is very significant to reduce the income gap. The high unemployment is resulted from the big income gap. The big income gap is not beneficial for the labor.

(h) *Population growth:* The gap of the population growth is another factor explaining the variation of the cross-country in the income distribution. Generally, it is believed that the fast population growth is closely related to the big income gap. One of the reasons is that the burden is placed to the low class of society.

(i) *Education level:* One of the important factors underlying the distribution and the income gap is the education level. On one hand, the uneven education opportunity causes the big gap in the income distribution by expanding the skill and the productivity of the working society. On the other hand, the uneven income distribution tends to prevent the investment of the low class of society to the education and skill accesses.

Arsyad (2010) argues that there are eight causes of the uneven income distribution in the developing country, they are listed as follows.

(a) The fast population growth will cause the decreased per capita income,

(b) The inflation in which the demand of money is getting higher is not followed proportionally by the goods productions,

(c) The regional development is not evenly carried out,

(d) The social mobilization is relatively low,

(e) Most of the investment is made in the capital-tight project, thus, the addition from the capital income is bigger than the income resulted from the work, so the unemployment level is higher,

(f) The implementation of the imported substitution industry policy causes the increasing price of the industrial goods to protect the business of the capitalists,

(g) The exchange rate of the developing country when trading with the developed country is very low as the result of the inflexibility of the demand of the exported goods of the developing country, and

(h) The small industry of the society, such as crafts and household industry, is not well-developed.

The increasing number of population from time to time makes the area for the brackish water aquaculture decreases. Moreover, the regional development is not evenly implemented, such as the road development, infrastructure improvement, and human resources development. Despite being the plus traditional fish farmer, they need to be developed in the form of training and supervision to produce better product of brackish water aquaculture which is corresponding to the consumer's demand.

RESEARCH METHOD

This study takes place in Bangil sub-district, Pasuruan district, East Java. This location is chosen based on the job classification, namely the group of plus traditional fish farmer. They are people working in the

brackish water fish farm which still employs the traditional method (not the intensification or the modern one). They use the simple technology as long as it does not harm the environment and the product is free from the chemical elements. The object of this study is the household whose job is the plus traditional fish farmer. There are forty plus traditional fish farmer who become the sample of this research. The scope of this study is limited to the household income. The distribution of population and sample of the plus traditional fish farmer in Bangil sub-district, Pasuruan district, see in table 2.

Table 2
The Distribution of Population and Sample of the Plus Traditional Fish farmer in Bangil Sub-District, Pasuruan District

No.	Village Name	Population/Sample(fish farmer)	Percentage
1.	Kalianyar	32	80%
2.	Kalirejo	8	20%
	Total	40	100%

Source: Data is analyzed in 2017.

The data in this study are divided into two. First, the primary data. It is the data obtained directly in the field through the structured and unstructured interview with the household leader. The second one is the secondary data. These data are obtained from the literature study in the Agency of Fishery, *Balai Budidaya Air Payau* (BPAP) of the East Java government located in Bangil sub-district, Pasuruan district, East Java as well as the research finding reports. The data are obtained by using the purposive method. The researcher is deliberately obtaining the data so that the information obtained is based on what he expects. The population of this study is forty plus traditional fish farmer and all the population becomes the sample of this study.

Gini Ratio is used to analyze the gap of the income distribution whose formula is as follows in formula 1 (Makmur, *et al.* 2011).

$$GR = 1 - \sum_{i=1}^{n} fpi \times (Fc_1 + Fc_{i-1}) \qquad \text{...(formula 1)}$$

Note formula 1:

GR : Gini Coefficient

Fpi : The resident frequency in the *i* expenditure class

Fc_i : The cumulative frequency of the total expenditure in the *i* expenditure class

Fc_{i-1} : The cumulative frequency of the total expenditure in the $(i-1)$ expenditure class.

The value of *GR* is between zero to one as explained below.

(a) *GR* = 0, the income gap is perfectly even, which means that everyone earns the same income as others.

(b) *GR* = 1, the income gap is perfectly gapped, which means that the income is earned by certain people or certain group of people only.

(c) Gini Ratio is typically accompanied by the Lorenz curve analysis.

Linear Regression Analysis

This analysis is used to test how is the effect of other factors such as the number of working family member, the knowledge level of the plus traditional fish farm business, and the width and the type of the area to the income level of the resident. The equation is as follows in formula 2 (Gujarati, 2012).

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e \qquad ...(\text{formula 2})$$

Note formula 2:

Y = the income of the fish farmer

$\alpha\ \beta$ = the expected parameter

X_1 = the number of working family member

X_2 = the knowledge level of the plus traditional fish farm business

X_3 = the width and the type of the area of plus traditional fish farm

RESEARCH FINDING

The problem of income distribution was a complex matter as it was often related to the social value of the society. Some people saw the evenly distributed income as the valuable purpose as there was a morale implication and it was closely related to the appropriateness element and social justice. Moreover, the income distribution problem was also associated with the attempt to eradicate the poverty so that the social welfare of the society improved well.

The income earned by the plus traditional fish farm resident in Bangil sub-district, Pasuruan district, East Java showed the income earned by the plus traditional fish farmer or the households in the certain area. The income earned by each individual depended on the productivity level and their role in the economy. It was important to note that whether the development result in the form of production factor compensation (income) was evenly accepted by all residents. The indicator used to measure the income distribution was Gini Index, Lorenz curve, and World Bank Criteria (The Central Bureau of Statistics, 2016). The World Bank Criteria determined the income distribution examination based on the income earned by 40% of the low-income residents.

Based on the review, it was found out that the evenly distributed income of the plus traditional fish farmer could be reached when the area of the brackish water aquaculture was employed efficiently and effectively. The efficient and effective plus traditional fish farm business could improve the land productivity, thus, the fish farm production would increase, too. On the contrary, when the productive land of fish farm was not optimally employed, the fish farm production would decrease. This was in line with the law of production "the law of diminishing marginal productivity", when the productive land continued to accept additional labor, the production result would increase to reach the optimum point. However, when the labor was continuously added, the production result would decrease. To get the most of the fish farm production result, the cooperation between the society and the government was ultimately needed.

The strategy to improve the production result which could be done by the farmer was using the superior seed, excellent fish and prawn food as well as improving the water circulation and production pattern. Using the advanced technology was also needed in order to foster the production result. Meanwhile,

the attempt which could be done by the government to enhance the fish farm production result was providing the market for the fish farm harvest, determining the market price which benefitted the fish farmer and society, as well as socializing the advanced technology of fish farm business to the society. When the government and society could work hand in hand well, the productivity of the fish farm would increase. This would affect the production result which also improved from time to time. When the fish farm production result increased, fish farmer would earn higher income so that the per capita income would also be higher. The higher the per capita income, the bigger the national income.

When the regional income of Pasuruan regency increased, the economic growth of East Java would be better as well. Eventually, the national income would got higher, so the goal of economic development would be achieved and indirectly the income would be evenly distributed. The more evenly the income distributed, the lower the poverty level of the society. The economic goal would be achieved through the society welfare which was getting better. Table 3 below showed the analysis of the income of the plus traditional fish farmer in Pasuruan district, East Java.

Table 3
The Income of the Plus Traditional Fish Farmer in Pasuruan District

No.	Fish farmer Income (converted to rupiahs)	Total	Percentage	Gap Category
1.	< 4,750,000 rupiahs	4	10 %	Low
2.	Between 4,750,000 to 5,250,000 rupiahs	28	70%	
3.	> 5,250,000 rupiahs	8	20%	

Source: Analysis of Data 2017

The improved production of the plus traditional fish farm business would affect to the improvement of the income of the fish farmer resident. However, the improved income would not indicate the evenly distributed income, so certain strategy and attempt were needed to synergize production of the plus traditional fish farm business and the distribution of the income (Pollnac *et al.*, 2011, Olawumi, *et al.* 2010). According to Denny (2015), the evenly distributed income was an important aspect to be observed as it was one of the strategies and goals of the national development. Thus, in its practice, it was important to implement the way to maximize the regional development process and minimize the development gap as well as reached the evenly economic development by maximizing the economic sector in each region.

This study identified and analyzed whether the independent variable, namely the number of working family member (*X*1), the knowledge level of the plus traditional fish farm business (*X*2), and width and the type of land (*X*3) affected significantly to the attached variable of fish farmer's income (*Y*). T-test was administered to identify the partial effect between the independent variable (*X*) and dependent variable (*Y*). Table 4 explained the result of the multiple regression test.

From Table 4, it could be seen that the regression coefficient in the variable of number of working family member (*X*1), the knowledge level of the plus traditional fish farm business (*X*2), and width and the type of land (*X*3) were smaller than 0.05, which meant that it significantly affected the fish farmer's income (*Y*).

Table 4
Multiple Regression Test

Independent Variable	Regression Coefficient	t calculated	Sig. t	Note
Constanta	146641.0	24.821	0.000	Significant
X1	−0.000	−3.4684	0.0001	Significant
X2	−0.003	−2.2832	0.0105	Significant
X3	0.2143	4.9243	0.0000	Significant
t table ($t_{186,5\%}$)	= 1.369			
R-square	= 0.873			
F calculated	= 344.746			
Sig. *F*	= 0.000			
F table ($F_{3,186,5\%}$)	= 2.465			

Data source: Output Eviews 7.

F-Test

According to Gujarati (2012: 103), *F*-test was administered to identify the simultaneous effect of the variable of the number of the working family (*X1*), the knowledge level of the plus traditional fish farm business (*X2*), and width and the type of land (*X3*) to the dependent variable of the fish farmer's income (*Y*). Table 5 showed the result of *F* test.

Table 5
The Result of F-Test

Independent Variable	Regression Coefficient	t calculated	Sig. t	Note
Constanta	146641.0	24.821	0.000	Significant
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Sig. *F*	= 0.000			
F table ($F_{3,186,5\%}$)	= 2.465			

Data Source: Output Eviews 7.

From Table 5, it was seen that the value of R-square was 0.873 or 87.3%. It meant that the variable of low class society (*Y*) was explained by 87.3% through the variable of the number of working family member (*X1*), the knowledge level of the plus traditional fish farm business (*X2*), and width and the type of land (*X3*). The remaining 12.7% was explained by other variables or independent variable outside the regression equation.

The discussion of this study was initiated by analyzing the income distribution from time to time as well as some facts existing during the study in Pasuruan district. The previous researches pointed out the significance of the attempt to distribute the income evenly to the brackish water fish farmer through the strategy of the regional government. The income gap was a serious problem in every country as the bigger the income gap, the higher the poverty level and the lower the society welfare. The discussion of this study was able to analyze the income distribution of the plus traditional fish farmer, so it could be one of the indicators to formulate a policy to reduce the income gap and eradicate poverty in Pasuruan district.

The discussion of the study had to be continuously improved and evaluated in order to improve it so that it could be implemented in the long term period. The development of the analysis of income distribution was not stopped here. This discussion would be improved when it was tried out to some sectors or other regions in East Java whose characteristic was similar to this study. The target of this study has been fulfilled; it was to analyze the income distribution in the plus traditional fish farmer resident in Pasuruan district. By analyzing this discussion, the regional government of Pasuruan could use this as one of their references to improve and make the income distribution more evenly. Moreover, it could also be used as the review resources in order to establish policies in the fishery sector, particularly the brackish water aquaculture business for the plus fish farmer residents.

In the economic growth, there were several steps to decrease the income gap of the fish farmer in the fishery sector. The first step was to improve the traditional fish farm business whose productivity is low. This step was the very basic stage in the economic growth of a region. Then, diversification of the fishery product was the second step to be carried out when the fishery product has been marketed in the commercial sector yet the capital usage and technology utilization were still low. In this stage, it was explained that the fishery business has been able to produce many kinds of fishery product. The third step was figuring the modern fishery business whose productivity was very high. It was due to the fact that the use of capital and technology has been more advanced than before. In this stage, the fishery product was meant to be marketed to fulfill the foreign country's need (Kiran, *et al.* 2014).

In the economic world, the regional development and evenly distributed income were two ways to develop the economic growth. In the case of the income distribution of fish farmer, we discussed about the regional development. The regional development was an activity to support the regional income so that the region earned more money which resulted to the prosperity of the resident. There are some methods to determine if a region was prosperous or not. By applying these methods, we would identify the data of the regional economic growth and made decision to establish some policies which were suitable to solve the problem of the region. Thus, the economic growth rate was significantly higher and the region would be more prosperous (Olagunju, *et al.*, 2007).

To develop the fishery sector, particularly the brackish water aquaculture business existed in Pasuruan district, the regional government was expected to be able to revitalize the fishery sector. The revitalization was intended to improve the structure and performance of the decreasing fishery sector. In this revitalization process, there would be some obstacles which could inhibit the implementation of the process. The obstacle included the poor distribution of the fish or prawn food to the fish farmer, the minimum access of export, the poor information about the export, the minimum implementation of the revitalization process, and the lack of policy to support the fishery revitalization (Zainun, *et al.*, 2007). In the fishery sector, especially in the brackish water aquaculture, there were some problems faced by the fish farmer, namely the limited area for brackish water aquaculture, the low income of the fish farmer, poverty, the low quality of fish and

prawn food, the inhibiting natural obstacle, the low quality of labor, and the fluctuated product price in the market. The regional government was expected to be able to develop the fishery sector in the regions.

The uneven income distribution in the fishery sector particularly in the brackish water aquaculture was influenced by the knowledge possessed by the fish farmer in managing their business. (Ugwumba, 2011; Pollnac, *et al.*, 2011). The high-quality human resources in managing the plus traditional fish farm business could improve the productivity and optimize the harvest. The unqualified human resource would inhibit the growth of the fishery sector. There were some factors affecting the income distribution in the developing country like Indonesia. One of the factors was the unbalance between the population growth and the quality of human resources.

The income distribution was divided into three, namely the individual, functional, and regional income distributions. The individual income distribution was the indicator seen in each individual. This parameter was the most used indicator employed by researchers to analyze the income distribution. While the functional income distribution explained the income earned by production factor which focused on the percentage of the labor's income compared to the total income (rent, interest, and profit). The last but not least, the regional income distribution was the indicator of income distribution other than the other two mentioned earlier.

CONCLUSION

Most of the income distribution of the plus traditional fish farmer in Pasuruan district, East Java, is in the low category (the coefficient is 0.31 or 32% of the income gap). The average income of the plus traditional fish farmer is 5 million rupiahs per month. There are 28 fish farmer (70%) who earn 5,290,000 rupiahs per month, while other eight (20%) make 4,950,000 rupiahs per month. The remaining four fish farmer (10%) earn 4,740,000 rupiahs per month. The factors affecting the income distribution of the plus traditional fish farmer in Pasuruan district is the number of working family member, the knowledge level of the plus traditional fish farm business owner, and the price of the product produced by the plus traditional fish farm business.

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