

Does Covid-19 Really Impact On Export Fisheries Business? (Case Study: Kolaka Regency, Southeast Sulawesi, Indonesia)

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ABSTRACT

This study aims to analyze the impact of the COVID-19 pandemic on fisheries sector, including the export fishery business. Tanggetada Subdistrict, located in Kolaka Regency, Southeast Sulawesi Province, is one of the suppliers of export fishery commodities through Makassar City in South Sulawesi Province. The analytical method used is a different test of costs, revenues, and income in the export fishery business before and during the COVID-19 pandemic. The selected sample is four export fishery business actors using purposive sampling. The data used are primary data in the form of export fishery business data from each respondent gathered from interviews through questionnaires. While secondary data is supporting data from the Central Statistics Agency, the Ministry of Marine Affairs and Fisheries as well as several research results on the topic of scientific journals. The data then were analyzed using income analysis, which was carried out with a different test using the SPSS application. The results of the analysis of the different tests (paired sample t-test) show that there are significant differences in the income level of the export fishery of the four entrepreneurs before and during the Covid-19 pandemic.

Keywords: Export Fisheries; Covid-19 Pandemic; impact

INTRODUCTION

International trade can be used as an engine for economic growth in a country (trade as an engine of growth). The existence of international trade activities is expected to encourage the acceleration of economic development in the country (Pindyck & Rubinfeld, 2001; Salvatore, 2007). Indonesia as a maritime country of world has great potential in the trade in the fisheries and marine sector. Even in 2018, the Ministry of Marine Affairs and Fisheries and the Central National Statistics Agency released that the export value of fisheries and marine sector reached USD 3.52 billion, an increase of 11.06% (KKP, 2020a). Fisheries resources themselves have been used by local communities as a source of livelihood for a long time (Kholis et al., 2020).

The existence of this Covid-19 outbreak has a significant impact on income in the marine and fisheries sector, including local fishers (KNTI, 2020a; FAO, 2020; Zhang et al., 2020; Zhang & Chen, 2020; Zhao & Jia, 2020; Virananda & Ikhsan, 2021; and Nurhayati et al., 2021). The Covid-19 outbreak

is spreads very quickly and the government cannot ensure when this outbreak will end (WHO, 2020). Several studies have been carried out related to the impact of the Covid-19 pandemic on the income of the agricultural sector, MSMEs, including the marine and fisheries sector during the Covid-19 pandemic (Dwti et al., 2020; Grahadyarini, 2020; Reardon et al., 2020; Sari et al., 2020; Suhana, 2020; KNTI, 2020b; Hirvonen et al., 2021; Ayu, 2021). Since the government issued a policy regarding (Large-Scale Social Restrictions), community activities outside the home, be it work, education, or even transportation, have decreased (KKP 2019; Fan et al., 2020; UN-FAO, 2020a,b; Reardon et al., 2020; Sari et al., 2020; Wang & Yu, 2020; Yang, 2020).

The policy hinders and makes it difficult for local fishers and the capture fisheries industry in marketing their catches (FAO, 2020; Kholis et al., 2020; Virananda & Ikhsan, 2021; Nurhayati et al., 2021; Yang et al., 2021; Minahal et al., 2020; George et al., 2020; KKP, 2020b; BPS, 2021). The decrease in these activities in a long period will affect the daily income of the community, especially local

fishers and fish cultivators (Suhana, 2020; KNTI, 2020b; Sari et al., 2020). The obvious impact of the pandemic is deteriorating health conditions and an increasing number of people losing their jobs and income (Liu et al., 2020; Zhang, 2020a, b; Shi et al., 2020). The greatest impact was the drastic drop of the fish price due to a decreased demand for foodstuffs that are generally consumed. The drastic drop in fish prices is not commensurate with the labor and high operational costs (Sari et al., 2020; Zhang et al., 2020; Yang, 2020).

Some of the impacts of the Covid-19 outbreak on the fisheries sector have been widely reported by several national and international online mass media. Based on some reports, during Covid-19 there was a decline in exports of fishery commodities and a decrease in fishers income due to the break in the marketing chain (Ayu, 2020; Fan et al., 2020; Grahadyarini, 2020; Ayu, 2021; Hirvonen et al., 2021). Dwi et al. (2020) in their writings state that sales of fishery products have stalled during the Covid-19 outbreak. Based on some of the potential negative impacts caused by Covid-19, fishers need to have an understanding of Covid-19 and health protocols. Information regarding fishers understanding of Covid-19, health protocols, and their effect on fishers income is not clearly known so far. The Covid-19 has affected the capture fisheries industry from upstream to downstream, decreasing demand from abroad by 30-40% (KKP, 2020b). In addition, also reduced fishing activities due to restrictions at the port (quarantine before docking) and reduced absorption from processing factories (Ihle et al., 2020; Chu et al., 2020; Cheng & Zu, 2020).

Kolaka Regency is one of the regencies in Southeast Sulawesi Province, which also has a sizeable export fishery entrepreneur (BPS, 2021). The export fishery business was started as a small business due to limited capital. The business grow and develop along with increasing access to capital and markets in Makassar, South Sulawesi. Studies on the impact of the Covid-19 pandemic on export fisheries business from a microeconomic perspective have not been widely analyzed. Therefore, the author is interested to study how the pandemic affects the export fishery business.

METHODOLOGY

Location and Time of Research

This research was conducted in Kolaka Regency with the consideration that this regency is one of the centers of export fisheries business in

Southeast Sulawesi Province. The research location was intentionally determined (purposive sampling). This research was conducted from September 2021 to June 2022.

Types and Methods of Data Collection

This research used quantitative and qualitative data types. Quantitative data are the prices of export fishery commodities, the number of exported fisheries, the cost structure, revenue, and income of the export fishery business before and during the COVID-19 pandemic. Qualitative data is information or explanations that enlighten phenomena or events occurred at the research location. Data collection methods in this study are primary data and secondary data. Primary data is data collected directly by researchers to answer questions or objectives of this research through interviews by providing a list of questions (questionnaires) to respondents. Primary data are obtained directly from the object under study through the results of interviews and questionnaires. Secondary data is a collection of data on variables that have been previously collected and compiled by related agencies or institutions, secondary data is obtained from various sources such as literature, journals, theses, the Central Bureau of Statistics, and the Province of Southeast Sulawesi and the Ministry of Marine Affairs and Fisheries.

Analysis Method

This study used three data collection techniques: observation, interviews, and documentation. Furthermore, the data obtained is processed business analysis of export fishery business income. A paired sample t-test was used to test whether there was an obvious impact of the Covid-19 pandemic on the export fishery business in Kolaka Regency.

1. Export Fishery Business Cost Analysis

The cost analysis of export fisheries is used to estimate the size of the costs incurred by export fisheries entrepreneurs before and during the Covid-19 pandemic. The cost of export fishing business is divided into total fixed costs and total variable costs. Mathematically, it can be arranged in equation (1).

$$TC = TFC+TVC \dots\dots\dots(1)$$

Source: Pindyck & Rubinfeld, 2001; Soekartawi, 2006.

Remarks:

TC : Total Cost / Total cost of fishing business (IDR)

TFC : Total Fixed Cost/Total fixed cost of fishery business (IDR)
 TVC : Total variable cost (IDR)

2. Analysis of Export Fishery Business Revenue

This is an analysis used to identify the level of revenue from export fisheries businesses during the pandemic and before the pandemic occurred. Revenue from the export fishery business can be calculated by multiplying the amount of production by the unit price of production. Mathematically, it can be calculated using the equation (2).

$$TR = P_y \cdot Y \dots\dots\dots(2)$$

Source: Pindyck & Rubinfeld, 2001; Soekartawi, 2006

Remarks:

TR : Total revenue/Total fishery business revenue (IDR)
 P_y : Product selling price (IDR per Kg)
 Y : Number of products produced (Kg)

3. Export Fishery Business Income Analysis

Export fishery business income is the difference between revenue and the total cost of production. All analyzes are expressed in rupiah per one capture process (IDR/one capture process).

$$\pi = TR - TC \dots\dots\dots(3)$$

Remarks:

π : The net income (IDR)
 TR : Total Revenue (IDR)
 TC : Total Cost (IDR)

4. 'Difference Test' Using SPSS

To prove if there is an impact of the COVID-19 pandemic on the level of income from the export fishery business, comparison method was used using a different test with a sample (paired sample t-Test). The test of the average difference of two paired samples, or the paired sample t test is used to test whether there is a difference in the average for two independent samples that are paired the difference in the number of export fisheries before and during the Covid-19 pandemic on the variables of export fishery prices, costs export fishery business, level of acceptance and income of export fishery business. The hypotheses used in this study are as follows:

Remarks:

H₀ : There is no real difference in export fishery income before and during the Covid-19 pandemic.
 H₁ : There is a real difference in export fishery income before and during the Covid-19 pandemic.

RESULTS AND DISCUSSION

Characteristics of Export Fishery Entrepreneurs in Kolaka Regency

Characteristics of respondents are description of the identity of the respondent that distinguishes one respondent from another. The characteristics of the respondents included age, gender, last education, length of service, ship ownership status, and sources of capital. Respondents in this study amounted to 4 people and each respondent is an export fishery collector in Kolaka regency. The characteristics of these respondents are represented be seen in Table 1.

Viewed from Table 1 shows that all respondents are included in the productive category where the productive working age ranges from 15-64 years (Mubyarto, 1991; BPS, 2020). Someone at productive age will give maximum results when compared to unproductive age. The age of export fishery entrepreneurs indicates that they are at a productive age so that they can work optimally to get results with high productivity.

The education level of the respondents showed that there was only one person who graduated only

Table 1. Characteristics of Respondents of Export Fishery Entrepreneurs in Kolaka Regency, Southeast Sulawesi.

| No. | Characteristics of Respondent | Percentage (%) |
|-----|-------------------------------|----------------|
| 1. | Age | |
| | <15 years old | 0 |
| | 15-64 years old | 100 |
| 2. | >64 years old | 0 |
| | Education Level | |
| | Elementary School (SD) | 25 |
| | Middle School (SMP & SMA) | 75 |
| 3. | Bachelor | 0 |
| | Entrepreneurship Experience | |
| | <10 years | 0 |
| 4. | 10-20 years | 100 |
| | >20 years | 0 |
| | Ship Ownership | |
| 5. | Private | 100 |
| | Rental | 0 |
| 5. | Business Capital | |
| | Personal Capital | 50 |
| | Loan Capital | 50 |
| | Profit Sharing Capital | 0 |

from Elementary School (SD), and the remaining three people had the last education level of Middle School. Triyanti and Safitri (2012) explain that a low level of education may encourage farmers to rely on conventional skills. Education is crucial to increase the knowledge of export fishery entrepreneurs, because it indirectly affects the absorption of information about new innovations from the export fishery business they run.

An experience is an event that has been undergone by a person in interacting with his environment. The more experience of a person in running a business, the higher level of his business knowledge. The length period of a person has worked can reflect the experience they have gained during their work. The longer employees were in a company or organization, the more experiences. Employees they have a lot of experience will benefit the company and organization compared to employees who have less experience in work. The data in Table 1 states that the length of business in export fisheries is more than 10 years. This shows that these entrepreneurs have experience and that level of experience enables them to be able to lead and make good decisions about their export fishery business. In addition, a high level of business experience can show the level of links or networks in developing the export fishery business they lead.

Business capital or what is often called investment is expenditure to buy equipment or production inputs. Capital goods aim to increase capital in economic activities that are used to produce goods and services (Pindyck & Rubinfeld, 2001; Soekartawi, 2006; Sukirno, 2009). For every business, whether small, medium, or large, capital is one of the most important factors that can determine the level of production and income. Table 1 presents that the source of capital to build an export fishery business obtained from loans is 50 percent, and the rest obtained from their own capital.

Comparison of Export Fishery Prices and Number of Fisheries Traded Before and During the Covid-19 Pandemic

The inhibition of global economic activity as a result of restrictions on human movement during the COVID-19 pandemic will greatly impact the conditions of trade and marketing of food ingredients as well, including export fishery businesses run by export fishery entrepreneurs in Indonesia (Kholis et

al. 2020; Nurhayati et al., 2021). The Ministry of Marine Affairs and Fisheries (2020b) has issued a policy in the form of a Strategy for Mitigating the Impact of the Covid-19 Pandemic on Social Relations of Maritime and Fishery Sector Business Actors as an effort to protect related stakeholders from the negative impacts of COVID-19. McCarthy et al., (2021) and Malahayati et al., (2021) mention that the pandemic has changed the pattern and structure of marketing as well as various negotiations in the trade sector and the global economy (Villasante et al., 2020; Malahayati et al., 2021).

The unstable prices of a number of food commodities and the closure of a number of businesses led to a decline in income loss, and unemployment tended to increase sharply (Villasante et al., 2020; Cheng & Zu, 2020; Ye et al., 2020; Miao et al., 2021; Lucas et al., 2021). In its coverage, Indonesian Task Force of Covid-19 (2020) and OECD (2020) explained that some of the impacts of the COVID-19 outbreak on the fishery sector included a decline in exports of fishery commodities and a decline in fishers' income due to the breakdown of the marketing chain and reduced demand for export fisheries to entrepreneurs or wholesaler traders. Suhana (2020); Sari et al., (2020); McKibbin & Fernando (2020) explained in detail the impact of the Covid-19 outbreak on the activities of fishery actors in various regions in Indonesia. As in Pati and Cilacap regencies, Central Java, this epidemic has caused the prices of various fishery commodities to plummet by 30-40% and some have even reached 50%. Therefore, what are the price conditions of various export fishery commodities and how much is traded during the pandemic that has not arrived and when the pandemic lasts? The data on this are presented in Table 2.

In the export fishery business in Kolaka Regency, there are nine leading commodities traded. This commodity is a type of fish that is often requested to be supplied to Makassar. Sunu fish commodities consist of Red Sunu A2, Red Sunu A1, Black Sunu A3, Black Sunu A1, and Yellow Sunu A1. There is only one type of grouper commodity, namely grouper type rats. Lobster consists of pearl lobster and bamboo lobster. The last commodity is red snapper.

There was a significant decline in the prices of export fishery commodities. The decline in these prices ranged from 18% to 59%. In Table 2, the highest price decline was in the A1 red sunu fish commodity

Table 2 Average Prices of Export Fisheries Before and During the Covid-19 Pandemic in Kolaka Regency, Southeast Sulawesi.

| No. | Name of Export Fisheries Commodity | Average Prices (IDR per kg) | | % | Number of Export (kg) | | % |
|--------------|------------------------------------|-----------------------------|---------|--------|-----------------------|---------------|---------------|
| | | Before | During | | Before | During | |
| a | Red Sunu A2 | 385,000 | 180,000 | -53.25 | 115.75 | 92.5 | -20.09 |
| b | Red Sunu A1 | 575,000 | 235,000 | -59.13 | 42.75 | 29.5 | -30.99 |
| c | Red Sunu A3 | 65,000 | 45,000 | -30.77 | 16.25 | 15.25 | -6.15 |
| d | Black Sunu A1 | 122,500 | 95,000 | -22.45 | 20.75 | 18.25 | -12.05 |
| e | Yellow Sunu A1 | 300,000 | 130,000 | -56.67 | 40.75 | 31 | -23.93 |
| f | Grouper Type Rats | 250,000 | 120,000 | -52 | 302.5 | 237.5 | -21.49 |
| g | Pearl Lobster | 1,375,000 | 925,000 | -32.73 | 84 | 58.25 | -30.65 |
| h | Bamboo Lobster | 475,000 | 325,000 | -31.58 | 84.75 | 66.5 | -21.53 |
| i | Red Snapper | 70,000 | 57,500 | -17.86 | 173.75 | 128.5 | -26.04 |
| Total | | | | | 881.25 | 677.25 | -23.15 |

at 59.13%. The average decrease in the traded amount was between 6% until 31%. Red sunu fish type A1 is the commodity that experienced the most declined. Overall, the average decrease in the number of fish traded by export fisheries entrepreneurs in Kolaka Regency is 23.15%. Export fisheries entrepreneurs said that the decline in prices and the number of commodities traded occurred because the demand for fishery products from importing countries had also decreased. In the end, export fishery entrepreneurs and exporting companies did not operate very much. In addition, the distribution of fish has experienced obstacles due to (Large-Scale Social Restrictions), as well as rising fishing costs due to scarce fuel oil so that prices have increased (Sari et al., 2020; Putri & Perdana, 2020; Zhang, 2020b; Ye et al., 2020; Fan et al., 2020).

Differences In Export Fisheries Income Before And During The Covid-19 Pandemic

The revenue structure of export fisheries is the result of multiplying the number of fish traded with the selling price of the commodity (Pindyck & Rubinfeld, 2001; Soekartawi, 2006). Each commodity has a different price. This is because the companies they go to in Makassar are different. So the purchase price they receive is also different (Pindyck & Rubinfeld, 2001; Soekartawi, 2006). Furthermore, the total revenue from the sale of all types of fish from each entrepreneur is totaled and then divided by the number of entrepreneurs and an average value

of revenue is obtained (1k)¹. Furthermore, to get the average value of revenue in one year, multiplication of the value at 1k with the frequency of catching into the sea in one year is 48 times (1l)² so that the average value of revenue in one year (1m)³ is obtained. Based on the analysis of the export fishery business, the average export fishery revenue in Kolaka Regency before the pandemic was IDR 14,992,020,000 in one year, while during the pandemic, entrepreneurs only received an average income of IDR 8,714,880,000 in one year. This shows that there is a significant decrease in revenue. One of the factors is the decrease in the average number of fish traded and the decrease in the purchase price applied by the company during the Covid-19 pandemic.

¹1k is the code for The Average Revenue (Per catch). This value come from the formula $1j / 4$. 1j is the total revenue from all types of fish (IDR 182,710,000 + IDR 92,4000,000 + .. + IDR 50,675,000) = IDR 1,249,335,000. After that, this value is divided by four exporters (our respondents are the fourth biggest in Kolaka Regency) and we get the value of 1k = IDR 312,333,750 (before pandemic) and IDR 181,560,000 (during the pandemic)

²1l is the code for Catch Frequency In 1 Year (48). All of the respondents have the same schedule in fishing. They go the sea for about four times in a month. So that, we can conclude that there are 48 times in a year. We assume that it is four times in a month and we are multiplied by 12 months. So that, we get 48 times in a year for the catch frequency.

³1m is the code for Average Revenue in 1 Year. This formula is $1k * 1l$. it means that the average revenue in a year (before pandemic) comes from the multiple result from = IDR 312,333,750 (per catch) x 48 times catch = IDR 14,992,020,000. While, during the pandemic, the average revenue in a year is = IDR 181,560,000 (per catch) x 48 times catch = IDR 8,714,880,000.

The cost structure of fishery production consists of total fixed costs and total variable costs (Pindyck & Rubinfeld, 2001; Soekartawi, 2006). Total fixed costs are costs or expenses incurred to buy inputs or production factors that are fixed, namely ships, jerry cans, cork, spears, and machines. Furthermore, this cost is calculated using the depreciation cost of the factors or production inputs used. ⁴The second cost is the total variable cost consisting of the purchase of variable production factors, namely the consumption of labor, diesel, ice cubes, and transportation costs. The total variable cost is then divided so that the average variable cost is obtained which is then multiplied by the frequency of fishing 48 times a year so that the average variable cost in a year is obtained (2f)⁵. The input depreciation value is the value obtained from the value of a production input divided by the age or economic age of each production factor.

Furthermore, to get the average value of income or profit of the export fishery business in one year (3) is calculated by subtracting the average revenue in one year (1m) from the average total cost in a year (2g). The difference in variable costs is due to additional costs during the pandemic, namely the costs incurred to obtain information about marketing. We also do the R/C analysis to evaluate the significance change and make the real evidence caused by the Covid-19 pandemic. Based on Table 3, before pandemic, the R/C is 26.63 and that value decreased for about 8,97 points at 17.66. It means that the pandemic really gives the impact to the exporters. All of the values have a positive value (bigger than 1,00), but the value during the pandemic is decreasing. We know that R/C analysis can be used to determine the investment

⁴The total fixed cost in fishery business comes from the summary of the depreciation of all the fixed inputs. We can calculate that value by do a division the residual value with its economics age for every fixed input. For example, an exporter has 5 ships with an initial price of IDR 35 million and the estimated final value of the ship after 10 years later (we use 10 years as the economic life of the ship) is IDR 7 million. So, the depreciation of the ship is = [(IDR 35 million-IDR 7 million) x 5 pieces] divided by 10 years = IDR 14 million. We can use this method to assess all fixed input depreciation costs.

⁵2f is the code for Average Variable Cost in 1 year. The formula is $2d \times 2e$. 2d is the total variable cost. 2d comes from the division of Total Variable Cost (2c) and the number of our respondents (four exporters). So that, IDR 29,820,000 / 4 exporters = IDR 7,455,000 (before pandemic). While, during the pandemic, the value is = IDR 30,541,000 / 4 exporters = IDR 7,635,000. After that, we can calculate the value of the average variable cost in a year (2f) by multiply the value of 2d with the total catch frequency in a year (48 times) = IDR 7,455,000 x 48 times per year = IDR 357,840,000 (before pandemic and the value during pandemic is = IDR 7,635,250,000 x 48 times (per year) = IDR 493,378,859.

feasibility of a business. A business will be declared profitable if $R/C > 1$. We also conclude that this export fishery business is a profitable business. But, the players (the exporters) should have a big modal (investment) to make their business succeed.

Based on the results of the analysis of export fishery business income in Table 3, we can find that the export fishery business during the Covid-19 pandemic experienced a significant decline (Bar-Nahum et al., 2020; Marchisio, 2020; Yuliasara & Mahmiah. 2020). The difference in average export fishery income in Kolaka Regency is caused by the increase in the variable cost structure but in the revenue structure, it decreases. The decline in revenue was caused by the decrease in selling prices for all export fishery commodities as shown in Table 2. Meanwhile, in the variable cost structure, it was more due to distribution delays as a result of the Large-Scale Social Restrictions policy.

The impact of the Large-Scale Social Restrictions causes the export fishery business in Tanggetada District, Kolaka Regency had to struggle to survive. In Figure 1, when the initial conditions (before the pandemic occurred), the market equilibrium is created when the demand curve D^0 intersects the supply curve S so that the equilibrium point is point A where the initial price is P^0 with the quantity traded is Q^0 . During the Covid-19 pandemic, the demand curve for D_0 shifted to the left to become D_1 due to a decrease in demand. So that the new balance point is point B with the amount traded is Q^1 which will obviously cause a decrease in demand for export fishery commodities, both nationally and internationally. Thus the number of fish traded or supplied to Makassar also decreased. As a result, prices have also decreasing, requests from large collectors. The excess production and price is only $P1^*$. The analysis concluded that the decline in income received by export fishery entrepreneurs is real. Yuliasara and Mahmiah 2020; Pan et al., 2020; and Reardon et al., 2020 in their research also stated that the Covid-19 pandemic had a major impact on the income of the fishery business they run.

Then, let us return to the analysis from the producer side as the regulator of costs or expenses for export fishing companies. During the Covid-19 pandemic, the total variable costs (in Table 3) show that there is an increase. One factor is the additional cost to obtain information and other efforts so that marketing can continue to be carried out to Makassar.

Table 3 Average Export Fisheries Income Before and During the Covid-19 Pandemic in Kolaka Regency, Southeast Sulawesi.

| No. | Structure | Before the Covid-19 Pandemic (IDR) | During the Covid-19 Pandemic (IDR) |
|------------------------|---|------------------------------------|------------------------------------|
| 1 | Revenue Structure | | |
| a | Red Sunu A2 | 182,710,000 | 72,880,000 |
| b | Red Sunu A1 | 92,400,000 | 29,260,000 |
| c | Red Sunu A3 | 4,500,000 | 2,940,000 |
| d | Black Sunu A1 | 14,150,000 | 91,510,000 |
| e | Yellow Sunu A1 | 48,900,000 | 25,160,000 |
| f | Kerapu Tikus2 | 302,500,000 | 184,250,000 |
| g | Pearl Lobster | 404,000,000 | 208,000,000 |
| h | Bamboo Lobster | 149,500,000 | 81,750,000 |
| i | Red Snapper | 50,675,000 | 30,490,000 |
| j | Total Revenue (Per Catch) (All export entrepreneur) | 1,249,335,000 | 726,240,000 |
| k | Average Revenue (Per Respondent) (j/4) | 312,333,750 | 181,560,000 |
| l | Catch Frequency In 1 Year (48) | 48 | 48 |
| m | Average Revenue in 1 Year (1k*1l) | 14,992,020,000 | 8,714,880,000 |
| 2 | Cost/Expenditure Structure | | |
| a | Fixed Cost | | |
| b | Average of Fixed Input Depresiation | 205,137,502 | 126,886,859 |
| c | Total Variable Cost | 29,820,000 | 30,541,000 |
| d | Average Variable Cost | 7,455,000 | 7,635,250 |
| e | Catch Frequency In 1 Year (48) | 48 | 48 |
| f | Average Variable Cost in 1 year (2d*2e) | 357,840,000 | 366,492,000 |
| g | Total Cost in 1 year (2b+2f) | 562,977,502 | 493,378,859 |
| 3 | Average Income in 1 year (1m-2g) | 14,429,042,498 | 8,221,501,141 |
| Analysis of R/C | | | |
| | Revenue | 14,429,042,498 | 8,221,501,141 |
| | Cost | 562,977,502 | 493,378,859 |
| | R/C | 26.63 | 17.66 |
| | Change of R/C | | -8,97 |
| | % R/C | | -33,68% |

When the total variable costs increase, the total costs also increase. According to the law of supply, when the total cost increases, the price applied should also increase to P2. However, the amount that can be traded is only P1*. This condition also causes the income received by export fishery entrepreneurs to continue to decline.

Interestingly, if we assume that the amount of fish supplied to Makassar is Q0, then if we meet the shifting demand curve (D1), the price applied is only P1*. This fact can also be concluded that fishery entrepreneurs have also experienced a decrease in their income from their business. Furthermore, to increase confidence in the results of the analysis

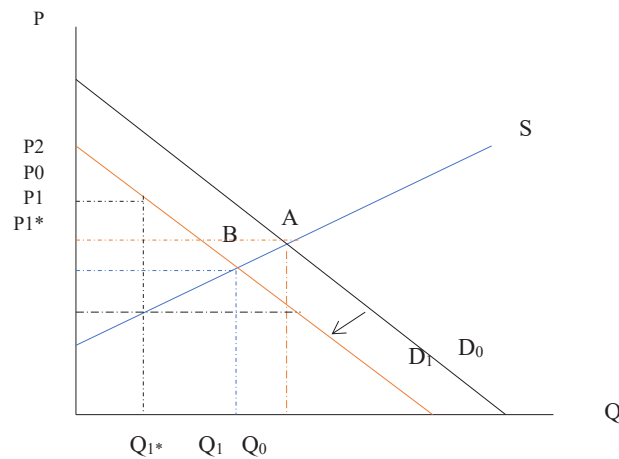


Figure 1 Microeconomic Analysis Due to Covid-19 on Export Fisheries Business in Kolaka Regency, Southeast Sulawesi.

Table 4 Results of the Analysis of the Average Difference Test (Paired Sample T-Test) of Export Fisheries Income Before and During the Covid-19 Pandemic.

| | t | df | Sig, (2tailed) |
|---|-------|----|-------------------|
| Pair – Export Fisheries Business Income 1 Before the Covid-19 Pandemic and Export Fisheries Business Income During the Covid-19 Pandemic | 2,585 | 3 | 0,081 |

of export fishery business income, it is necessary to carry out statistical tests. This test is used to provide confidence that the Covid-19 pandemic really has an impact on the export fishery business in Kolaka Regency.

From the results of the analysis of the average difference test (paired sample t-test) using the SPSS V21 program, the difference in fishery income before and during the Covid-19 pandemic can be seen in Table 4. The t-value is 2,585 with Sig. (2-tailed) of 0.081 or less than α (0.15), then H_0 : rejected and H_1 : accepted. So that it can be interpreted that there is a real difference between income before the Covid-19 Pandemic and during the Covid-19 Pandemic (Pan et al., 2020; UNICEF, 2020).

CONCLUSIONS AND POLICY RECOMMENDATION

Conclusion

The average price of export fishery commodities has decreased during the Covid-19 pandemic when compared to prices before the Covid-19 pandemic. The decline in prices ranged from 18-59%. The number of fish traded to Makassar also experienced a

significant decline, ranging from 6-31%. The decline in the price and quantity of fish traded has a significant impact on the revenue structure of export fishery entrepreneurs. Furthermore, from the production cost structure, variable costs have increased during the Covid-19 pandemic. The existence of causes additional information costs so that fish can be crossed to Makassar, South Sulawesi. Therefore, the cost structure also increases. The increase in the cost structure is not accompanied by an increase in the revenue structure, so the export fishery entrepreneurs are increasingly under pressure. The difference in received income by export fishery entrepreneurs has been tested using a paired t-test sample. The results show that there is a significant difference between income before the pandemic and income during the Covid-19 pandemic. This phenomenon has been analyzed micro economically in Figure 1. The decline in income is unavoidable because the Covid-19 pandemic has caused global economic paralysis. Based on the R/C Analysis, the Covid-19 pandemic really makes a significance change. Although the RC value is still above the value of 1.00, but the declining numbers is quite real, which amounted to 33.68 %. We understand that our research is only conducted in

a small regency in Southeast Sulawesi Province and the result are not universal conclusions. However, they may be indicative of the situation in Indonesia if a larger sample can be analyzed.

Policy Recommendation

It is expected that the government will allocate special protection funds for fishers whose incomes have decreased due to the spread of Covid-19. In order to reduce fishers losses, it is expected that they are introduced a digital marketing technology. In addition, it is necessary to further develop and improve the technology to encourage an increase in people's purchasing power in meeting fish consumption needs in the midst of the Covid-19 pandemic. It is gained through the preparation of online-based fishing media facilities for fishery products, so it can help reducing the direct interaction between fishers and cultivators as providers and buyers which will increasingly benefit from the use of these technologies which will bring the supply chain of fishery products closer to the market, which in turn can increase income and demand for ready-to-process products such as ready-to-eat products processed, in safety and frozen fish. Further researchers are expected to be able to conduct research on the impact of the Covid-19 pandemic on other businesses.

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We hereby declare that the contributions of each author to the writing of this paper are: Campina Illa Prihantini, Muhtar Amin and Nurfadila as main contributor. Nursalam, Yuli Purbaningsih and Ramlah Saleh as member. The authors declare that the Author Contribution Letter has been attached.

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