

The Impact of Covid-19 on Fisherman Revenue in Bagansiapi API City, Indonesia

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Abstract:

The purpose of this study is to predict the impact of COVID-19 on the income of fisherman in Bagansiapi Api City in Riau Province Indonesia. Fishermen's income fluctuation has many factors, some that can be controlled and some that cannot be controlled. One of the factors that is believed to affect fishermen's income is the COVID-19 pandemic. The research was conducted in April-May 2020 in Bagansiapi api City. The method used is the case study method using trend analysis (time series). It was found that the total income of gill net fishermen in Bagansiapi Api City has decreased gradually and will decline sharply until June 2021. The impact of the COVID-19 pandemic has been felt by fishermen due to the drop in fish sales prices. Fishermen are predicted to be in debt from December 2020 to June 2021, with a prediction of the highest peak decline in income and initial debt in December 2020 with a percentage of -372%.

Keywords: *Bagansiapi Api, COVID-19, Fisherman, Income*

INTRODUCTION

The geographical location on the west coast of Sumatra Island facing the Indonesian Ocean makes Bagansiapi Api City has enormous fishery potential (Mulyasari, 2015). This resource potential includes two categories, namely marine fishery resources in the territorial area (0-12 nautical miles) of 86,145 tons / year and in the ZEEI sea area (12-200 nautical miles) of 100,072 tons / year. The potential types of marine fish that exist consist of large and small pelagic fish, demersal fish and other marine biota (Dirjen PDSPKP KKP, 2018). Fishery resources in the waters have been used by local communities as a source of livelihood for a long time (Erwina et al., 2015), namely supporting the livelihoods of most coastal communities as well as food, as an economic source for regional development and as a source of support for community recreational activities fishing (Masydzulhak, 2005).

The fishing business activities in Bagansiapi api City include small fishermen with simple technology (Mulyasari, 2015). The fishing gear used by most fishermen in this city is gill nets of various sizes according to the fishing season. The number of gill nets fishing gear is 1,435 units or around 47% of the total fishing gear in this city (KKP Statistical Data, 2016); (Director General of PDSPKP KKP, 2018).

The welfare of fishermen is determined by the level of income of fishermen. Fishermen's income is an accumulation of fishermen's business results that do not stand alone, but are influenced by various factors. Therefore, the income of fishermen in Bagansiapi Api City fluctuates along with fluctuations in supporting factors such as capital, season, climate, fishing gear productivity, fishing area (Indara et al., 2017), fish prices and the amount of catch (Ridha, 2017).

Corona virus disease 2019 (COVID-19) was first identified in December 2019 in Wuhan, China, has caused a pandemic and caused panic in people around the world today (Azamfirei, 2020). As a result of this pandemic, changes in consumption and employment patterns have resulted in changes to the food commodity market, one of which is fish. The existence of uncertain conditions and high concerns regarding health occurs in the social life of the community, including the fishing community in Bagansiapi Api City. The COVID-19 factor is believed to affect fishermen's income. Mubarok and Fajar (2020) explained that the impact of the COVID-19 pandemic that was felt most by fishermen was that the price of fish had decreased drastically by up to 45%. This is not worth the effort

and operational costs incurred by fishermen when fishing at sea.

In addition, currently the government has implemented a policy of socializing and implementing social distancing, physical distancing, work from home (WFH), and large-scale social restrictions (PSBB) as stated in Government Regulation No. 21 of 2020. This policy is considered to be very difficult for local fishermen and the capture fisheries industry in marketing their catch. As a result, many fishermen's catches deteriorate in quality and even rot. Not only that, some fish storage warehouses (cold storage) have accumulated fish raw materials or are over stock because they cannot be supplied outside the area as usual (Djailani, 2020). COVID-19 spreads very quickly and it is not known how long this outbreak will end. Looking at the current situation, it is necessary to study the prediction of the impact of COVID-19 on the economic trends of coastal communities before the COVID-19 pandemic and during the COVID-19 pandemic. The purpose of this study is to predict the impact of COVID-19 on the income of gill net fishermen in Bagansiapi Api City.

LITERATURE REVIEW

As a job that depends on natural resources, a job as a fisherman is the job that is most sensitive to policy changes but is also influenced by factors that cannot be controlled by humans such as natural factors such as seasons. These uncontrollable factors also cause vulnerability to the fishermen's economy, which is highly fluctuating. Research conducted by Zuriat (2016) at South Sulawesi shows that the local government has tried various programs to implement, including exploiting the potential of fishery resources which aim to increase the income and welfare of fishing communities. Such as the use of fishing facilities in the form of motor boats, motorboats and floating charts. With the current uncertainty of the COVID-19 pandemic conditions, a strategy is needed for fishermen to be able to survive and get out of this plague disaster. Apart from social assistance intervention from both local and provincial and even central government, fishermen's survival strategies of course need to be improved. Several studies that have been carried out show how fishermen can survive from the uncertainty of their environmental conditions, such as Nasrudin (2016) who found

various ways of fishermen to fulfill their daily needs, such as fishermen at Lohsari Beach, namely by utilizing local institutions that are still quite strong such as mutual cooperation. mutual cooperation, kinship ties, neighborhood relations and a high sense of solidarity among fishermen. This has created a tolerant attitude that appears in the form of sharing among fishermen. This social relationship is one of the survival strategy mechanisms for poor fishing communities.

Research conducted by Wahyudin (2016) found that traditional fishermen have developed since 1980, with the emergence of modernization among fishermen in the form of using machines on boats, this has encouraged fishermen to increase the productivity of their catch and start fishing in areas further from the coastline. By switching to modern equipment, fishermen do not only focus on household needs but further increase the productivity of their catch in order to improve the economic standard of living of their families, so it is hoped that fishermen will get out of the poverty line.

According to Tain (2013) there are 15 dominant factors that cause poverty in small fisherman households, namely: institutions that are detrimental to small fishermen, programs that do not take sides with small fishermen, an afterlife-oriented view of life only, limited resources, mismatching of fishing gear, low investment, tied to debt, extravagant behavior, limited fishing season, damage to ecosystems, encroachment of fishing areas, weak law enforcement, competition to outperform other fishermen, use of prohibited tools / materials and fishing behavior.

METHODOLOGY

This research is based on survey data. A total of 14 surveys were conducted during April-May 2020. The research location was determined in sub-districts, namely Bagansiapi Api Harbor. The structured interview technique was chosen as the primary data collection technique. Determination of research respondents was done randomly (random sampling) as many as 200 people or about 10% of the total fishermen in Bagansiapi Api City. Secondary data were obtained from related service reports, both published and unpublished as well as other related literature. Data on fishermen's income were obtained before the COVID-19 pandemic and when the COVID-19 pandemic occurred. The object

of this research is gill net fishermen in Bagansiapi Api City, Riau Province. Supporting materials in carrying out the collection activities in the field consist of stationery, research questionnaires, digital cameras and other supporting tools.

Data on fishermen's income and fishing activities in Bengkulu City obtained during the data collection process in the field are then selected according to needs and analyzed. This study uses a simple analysis to see the trend (time series data) of fishermen's income in Bengkulu City. Trend is a state of data that is increasing or decreasing from time to time. While time series data are the values of a variable sequentially according to time (for example: day, week, month and year). In estimating income (economy) there is usually a fluctuation / variation from time to time or what is called time series variation. This variation is usually caused by the presence of trend factors, cyclical fluctuations, seasonal variations, and the influence of random (irregular / random influences) (Yulianto, 2012).

Data on fishermen's income were recapitulated for the last 3 months before the COVID-19 pandemic was created (October-December 2019 and March-May 2020) and prediction data during the COVID-19 pandemic (Forecast from December 2020 to June 2021). Time series data were analyzed using the least squares method which follows the general equation as follows:

$$\hat{Y} = a + bx \quad (1)$$

Information:

a = Constant number

b = Trend line skew coefficient x = Represents time (months)

Meanwhile, to find the a and b values from the above equation, the following equation is used:

$$a = \frac{\sum y}{n}, \quad (2)$$

$$b = \frac{\sum xy}{\sum x^2} \quad (3)$$

Overall, the length of time for calculating the prediction of fishermen's income can be combined with the following assumptions:

1. Samples were taken randomly at Bagansiapi Api Harbour.

2. Fluctuations in natural conditions are considered to be the same, namely before the COVID-19 pandemic and during the COVID 19 PANDEMIC.

3. The start of the COVID-19 pandemic in March 2020;

4. Prediction of the end of the COVID-19 in June 2021; and

5. The ability of the interviewer when collecting field data is considered the same.

RESULT AND DISCUSSION

The main livelihood of the coastal community of Bagansiapi Api City is fishing in the sea or better known as fishermen. Bagansiapi Api City fishermen are fishermen who work from generation to generation. The economic condition of coastal communities is still classified as poor with traditional fishing gear used with the coverage of fishing areas that are still close to the coastline (Wahyudin, 2016) but from the income level, they can meet basic needs and other needs such as snacks for children, transportation and communication. become a routine necessity in everyday life (Zuriat, 2016).

The fishermen in Bagansiapi Api is still categorized as traditional fishermen. Fishermen determine the fishing ground using experience, habit and feeling. The fishing gear operational area is between 0-12 nautical miles with the characteristics of substrate waters with sand, rocky and coral reefs. Lancang is a boat that is used as a fishing fleet by fishermen. Lancang is a type of boat equipped with a 6.5 PK engine with a payload capacity of 2 GT.

Bagansiapi Api fishermen's income is the difference between revenue and fishing costs that are actually spent per trip or per year. The results of this study explicitly provide an overview of fishermen's income before the COVID-19 pandemic looks stable, but the presence of this pandemic has caused a drastic change in the income level of fishermen in the research location. According to Kholis et al., (2017) fishermen's income is seen from the number of fish they catch after carrying out a fishing operation. Furthermore, Wismaningrum et al., (2013) revealed that income is the value of money obtained from the sale of fish production which is influenced by the large number of fish caught and the price formed when landed.

Multigear fishing business income is obtained from the amount of production per fish multiplied by the average price of fish. According to Rahim (2011), the gap between utilization and management of Indonesian marine fisheries is an obstacle in increasing fishermen's income. Where fisheries management policies have not reached the interests of groups. Several cases show that small-scale fishermen have experienced stagnation in

productivity. The low productivity results in fishermen's income in the long run unable to meet their business and household needs. The prediction results on the average income of fishermen in Bagansiapi Api City before the pandemic and during the COVID-19 pandemic (October 2019- December 2020) show a significant decline (Figure1)

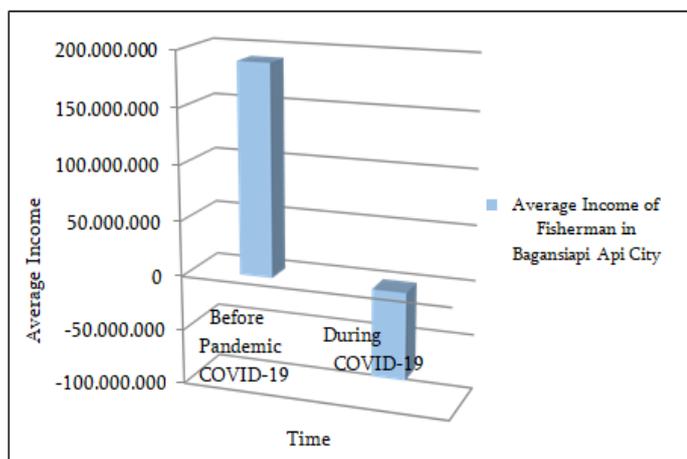


Figure 1 Prediction of Fisherman average Income in Bagansiapi Api City.

Figure 1 shows that the prediction of the average income of fishermen in Bagansiapi Api City before the COVID-19 pandemic (October 2019-February 2020) is IDR 250,954,514,5 whereas the predicted average income during COVID-19 is IDR 65,887,000,00. So the prediction / forecast of the average income of fishermen before COVID-19 can be said to be still stable and under control, but during the COVID-19 pandemic (December 2020-June 2021) the average income of gill net fishermen decreased drastically (minus) by Rp- 65,887,000.00 in economic terms, fishermen are predicted to be in debt until the predicted COVID-19 pandemic assumptions end in June 2021.

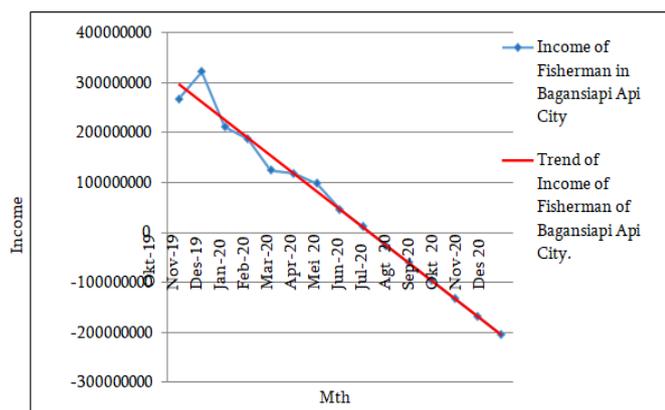
For example, research conducted by Indara (2017) which calculates the income of fishermen in Banyumas City, has an average income value of IDR 532,468,700.00 every three months. Meanwhile, the average income per fisherman is IDR 9,65,700.00. Furthermore, research conducted by Mubarak (2011) found that the income of the fishermen community in Tegal City so far is still very dependent on the fishing season. The income of the fishing community is divided into 2 (two) seasons, namely the high season and the low season. During high season, fishermen tend to get more income, but their expenses tend to be wasteful. Meanwhile, during the low season, income decreases or does not exist. According to Wahyono et. al (2001); Kusnadi (2003); Ismail (2007) states that fishermen's income is very different from other types of business, such as traders or even farmers. If traders can calculate the profit they get every month, so

can farmers predict their harvest yields, then this is not the case with fishermen whose activities are full of uncertainty and are speculative and volatile.

Before the COVID-19 pandemic, the income of fishermen was still stable, from the survey data from May to June there was an increase in income by 21%. It is assumed that June is the peak fishing season in Bagansiapi Api with a total income of fishermen of Rp. 331,630,000.00. This agrees with (Directorate of Credit, BPR and UMKM, 2008) that the peak season for catching fish usually occurs from February to June, the rest is when the fish is quiet (famine). Before the COVID-19 pandemic, fishermen's income had started to decline from July 2020 to August 2020 by - 73% to - 11%. This means that prior to the COVID-19 pandemic, fishermen's income had fluctuated down to -11% (Table 1).

During the COVID-19 pandemic, it is predicted that the income of fishermen will fluctuate drastically until January 2021 by -372%, and become positive again in July to December 2021. This means that the income of fishermen will continue to decline until June 2021 and in the month of it is predicted that in January 2021, fishermen will start going into debt with a percentage of - 372%. January 2021 is also predicted to be the peak of the decline in the income of the fishermen in Bagansiapi Api City. The high percentage of debt in January 2021 was due to fisherman who were not in debt before becoming debt so the percentage increased dramatically from -43% to -372%. This is thought to be the impact of the uncertainty over when the COVID-19 pandemic will end. This means that BagansiapiApi City fishermen will continue to be in debt until the COVID-19 pandemic ends with a reduced percentage of debt per month. It is predicted that the reduced percentage of debt is due to the inability of fishermen to repay their debt if they continue to be in debt with an increasing percentage.

Figure below shows that the income trend equation for fishermen in Bagansiapi Api City is $\hat{Y} = 1.788.260 - 247451.75 (x)$. With this equation it can be predicted that the income trend of fishermen will decline sharply until June 2021. In contrast to the case of skipjack tuna catches (production) in Cilacap has the equation $\hat{Y} = 18,480.53 + 7,661.11 (x)$, which means the trend of catch Skipjack tuna landed at PPS Cilacap will tend to increase, so that the need for raw material supply for skipjack tuna for the next three years can still be met (Saputra et al., 2014). Bagansiapi Api City fishermen need strategies to deal with prediction of difficult times like today, such as the adaptation strategy proposed by Nasrudin (2016) which is used by fishermen to deal with uncertainty of income by combining work in turn.



Trend of Fisherman Income of Bagansiapi Api City before and during Pandemic COVID-19 (October 2019-December 2020)

Table below explains that the income fluctuation of gill net fishermen in Bagansiapi Api City is very varied. COVID-19 has clearly affected the selling price of fish, so the income of fishermen Bagansiapi Api City has decreased very sharply (drastically). The impact of COVID-19 has no effect on the total catch of fishermen, so that it makes fishermen lose money due to decreasing fish prices and even being unable to sell their catch. Another factor that affects the total catch of fishermen in Bagansiapi Api City is the weather and season, because these two factors greatly affect the length of fishing trip for fishermen in Bagansiapi Api City which results in a reduced total catch.

This is in line with what Rahim (2011) found in a study of fluctuations in income from fishermen's catch in the coastal areas of South Sulawesi which are caused by seasonal factors, especially during the dry season which is usually marked by a decrease in the number of catches. This has resulted in price fluctuations that have an impact on decreasing fishermen's income. Furthermore, Rahim (2011) also explains that motorboat fishermen at the research location are positively affected by kerosene prices and productivity and negatively affected by gasoline prices, length of time at sea, trips and differences in fishing ground.

Predicted Percentage of Fisherman Income in Bagansiapi Api City.

Month	Fisherman Income (Rp)	(%)	
May-20	275,440,000	0%	-
Jun-20	331,630,000	21%	Increase
Jul-20	190,540,000	-73%	Decrease
Agt-20	173,840,000	-11%	Decrease
Sep-20	112,025,000	-54%	Decrease
Oct-20	107,143,000	-6%	Decrease

Nov-20	85,200,000	-26%	Decrease
Dec 20	35,413,000	-43%	Decrease
Jan-21	9,544,613	-372%	Decrease
			Peak Decrease (Early Debt)
Feb- 21	- 71,045,756	87%	Decrease (Debt Increase)
Mar- 21	-105,912,134	68%	Decrease (Debt Increase)
April21	- 145,548,417	38%	Decrease (Debt Increase)
May-21	- 179,476,813	19%	Decrease (Debt Increase)
June 21	- 212,493,000	18%	Decrease (Debt Increase)
Note:			
March-April	=	Early Pandemic COVID-19	
May-December	=	Fisherman Income Prediction	

The trend of decreasing fishermen's income significantly (fluctuating conditions) at the research location, it is necessary to anticipate both the fishermen themselves as the main actors (prime movers) and the related policy makers.

Alternative solutions should be prepared based on the results of this study which describe extreme conditions (predictions) as the impact of COVID-19 is moderate and will occur in the next few months for fishermen in Bagansiapi Api City.

CONCLUSION AND RECOMMENDATION

From this research, it can be concluded that the COVID-19 pandemic has a significant impact on the income of fishermen in Bagansiapi Api City due to the plunge in fish sales prices. Fishermen are predicted to be in debt from December 2020 to June 2021, with a prediction of the highest peak decline in income and initial debt in January 2021 with a percentage of -372%. Therefore, further actions by policy makers in the Bagansiapi Api City (related stakeholders) to ensure the sustainability of fishery business in Bagansiapi Api City in years to come.

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