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Research Article

Effect of Covid-19 Pandemic to the Fishers in a Coastal Municipality in the Philippines

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ABSTRACT

The fishing industry was not spared by threats of Covid-19 pandemic, despite being considered as part of essential industry. This study determined the effects of the pandemic to the fishing industry, particularly the fishers, in terms of their cost of operation, sales and volume of catch. It also identified their problems encountered and the strategies used to deal with the problems. The study employed descriptive quantitative research design. Respondents, who are the local fishers in a coastal municipality of Bulan, Sorsogon, Philippines, are randomly chosen through stratified random sampling. Survey questionnaire was used and data were analyzed through descriptive statistics. Results revealed that respondents had been heavily affected by the pandemic, particularly in their cost of operation among the three areas of concern. This was due to increase in prices of crude oil/gasoline, food commodities, and fishing gears and equipment. Only few respondents, however, expressed that there are effects on sales and volume of catch. Findings of the study revealed that most common problems were price increase in gasoline/crude oil and fishing gears, as well as price volatility of fish. Study found that respondents took loans (from loan sharks/brokers), repaired their fishing gears by themselves (instead of buying or paying for repair) and attend more to their alternative source of income, to overcome the challenges of pandemic to their livelihood. It recommends that local government must consider providing fishers with relief/loan assistance, particularly during state of calamities, as well as providing livelihood programs and skills training for more sustainable alternative source of income.

Keywords: *effect of Covid-19 pandemic, effect to fishing industry, fisherfolks, municipality of Bulan, Sorsogon*

Introduction

When the Philippine government ordered an enhanced community quarantine in March

2020, all economic activities was suspended. Thus, all sectors have been affected. Although essential workers, including the food sector,

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continues to operate, the strict protocols and the transport restrictions resulted to a disruption in the supply chain and in logistics (World Bank, 2020)

The fishing industry is part of the essential workers who were not ordered to suspend its operation. Thus, fishing and fish trading continues to operate. Inter-agency Task Force (IATF) for the Management of Emerging Infectious Disease, through its Resolution No. 15, allowed the farming and fishing industry to continue its operation (Inter-agency Task Force for the Management of the Emerging Infectious Disease, 2020). In the report of International Labor on the labor market impact of Covid-19 in the Philippines, agriculture and fishing has low expected impact as it faced a low risk of job disruption (International Labour Organization, 2020).

Despite the continuous operation, the fishing industry have not been spared by the adverse impacts of pandemic. And these are due to changes in food consumption and the challenges of reaching the customers brought about by logistic restrictions and lockdowns (Organisation for Economic Co-operation and Development, 2020).

The International Institute for Environment and Development contends that the most affected groups are the small-scale fishers, particularly those from the rural areas. The municipal fishers sector depends heavily on their livelihood; thus, the loss of bigger market, lack of tourists and usual buyer, issues around transportation and storage, increase in production cost, would harm the sector severely (Quallen, 2021; Pita, 2021) Small scale fisheries have been harmed by the restrictions that were put in place (Pita, 2021).

The municipality of Bulan is a coastal town in the province of Sorsogon, which makes fishing as one of the residents' main source of livelihood. One third of barangays or 20 barangays are in the coastlines. It has registered 4,930 fisherfolks and 394 non-commercial fishing boats (Municipal Agriculture Office, 2020). Bulan is the biggest fish producer in the province as its coast and nearby coasts is the home of sardine fishes. According to the Bulan Fish Port, they recorded 28,744 metric tons of Sardines fish caught and

landed in the fishing areas of Bulan, particularly the Ticao Burias Sea and Samar Sea (Municipal Agriculture Office, 2020). Three species of Sardines fish are abundantly found in the Bicol-samar fishing area, which are *Sardinella fimbriata*, *Sardinella lemuru*, and *Escualosa thorocota* (Oceana PH, n.d.).

No sector has been spared by the negative impacts of pandemic. All has suffered its adverse effects. Although there is low-risk impact on the fishing sector, but the fishing industry, particularly the fishers, have also suffered the problems on transport restrictions, lower demands, and the increase in production cost, brought about by the pandemic.

The aim of the study is to describe and explore on the impact of the pandemic to the local fishing industry, particularly to the municipal fishers. Specifically, the study determined the effect of Covid-19 pandemic to the municipal fishers in terms of: (1) cost of operation, (2) sales, and (3) volume of catch. It also identified the problems encountered during the pandemic and the strategies they used to deal with them. Finally, the study aimed to formulate policy recommendations that can address and minimize the effect of pandemic to the municipal fishers.

Methods

The study will employ descriptive quantitative research design. The locale of the study is the municipality of Bulan in the province of Sorsogon. The fishermen, or those involve in capture fishing, who are residents and fishing in the municipal waters of Bulan, Sorsogon, are the target respondents to the study. The municipality of Bulan is a coastal town, which has the biggest fisherfolk community in the province. Municipal Agriculture Office reported a total of 394 registered municipal bancas and a total of 4,943 registered fisherfolks, in 2020.

Due to pandemic restrictions and safety protocols the numbers of respondents are kept to the minimum. Thus, a higher margin of error is employed, that 13%, was used to determine sample size. Thus, using the Slovin's formula, a sample size of 58 was drawn out of the given margin of error and number of populations.

To select the sample respondents, the combination of stratified sampling and systematic randomly sampling were used. The research locale is divided into two strata of coastal barangays, which are north coastal and the south coastal. The north coastal are composed of the 8 coastal barangays located at the northern part of the town, which includes Zone 6, Zone 7, JP Laurel, Inararan, Constanera, Nasuje, Danao, and R. Gerona. The south coastal are located at the southern part which includes 8 barangays – Zone 2, Zone 4, San Rafael, Otavi, Butag, Biton, Marinab, Osmena, Roxas, Quezon, and Sagrada.

The sample size is distributed to the two (2) strata that is 29 each. Subsequently, from the list of fisherfolks provided by the Municipal Agriculture Office, the 29 names from each stratum were systematically randomly picked as respondents for the quantitative survey.

The use of stratified sampling technique is due to the large geographic scope of the target locale and to ensure that almost all coastal areas are covered and represented. Table 1 shows the actual distribution of respondents from each stratum.

Table 1. Distribution of respondents

Stratum	No of respondents	%
South coastal	30	51%
North coastal	28	49%

The study used survey questionnaire to gather quantitative data. The survey questionnaire aims to gather data on the effect of Covid-19 pandemic to the fisherfolks, problems encountered by the fishers and strategies used to deal with the problems.

Survey questionnaire were divided into two sets of question. First set are questions related to their cost of operation, sales, and volume of catch. Respondents confirm if there are observed and experienced effect of pandemic to their cost operation, sales and volume of catch, before the pandemic and during pandemic. Then, respondent provide the quantitative value of such effect. Second set are open ended questions, such as the problems encountered of fishers during the Covid-19 pandemic and the strategies used by the fishers in dealing with the problems encountered.

The survey questionnaire had undergone face validation by the head of the Municipal Agriculture's Office to evaluate and ascertain the validity of the questions. The questionnaire was also translated into vernacular and was proofread by a professor in the field of linguistics.

As the study employed cross-sectional survey design, the one-time survey was conducted in the randomly chosen locations as illustrated in the preceding section. Prior to the actual survey distribution, pilot testing was administered

to a group of 15 respondents, from a coastal barangay and was excluded in the random selection for the actual survey. Feedbacks were sought from the dummy respondents to assess the comprehensibility and appropriateness of the questions. Responses were noted and revisions were done accordingly.

Upon arrival at the data gathering location, permission to conduct survey was sought from the barangay chairman or any present barangay official. Names of the randomly picked respondents were provided and requested to be visited for data gathering. Before the actual data gathering starts, the "Letter of Willingness to Participate" was signed by the respondent. In case where the target respondent was around during the data gathering, another name was randomly picked.

Quantitative data will be analyzed using descriptive statistics, that mean and percentages. Effects of Covid-19 pandemic to the fisherfolks is presented by determining the mean the cost of operation, sales, and volume of catch of the respondents before and during pandemic, as well as the percentage of respondents who can confirm that there was such an effect.

On the responses related to the problems encountered by the respondents and the strategies they used to deal with the problems they encountered, descriptive statistics were also used such as frequency and percentages.

Finally, from the results of the study, a policy proposal was formulated and had served as the output of this study.

Results and Discussion

Effect of Covid-19 Pandemic to the fishers in terms of cost of operation, volume of catch, and sales

The effect of Covid-19 pandemic to the fishers are presented and measured through the following terms of their operation, such as cost of operation, volume of catch, and gross sales. Cost of operation are measured by the amount of funds needed by the boat crew for every fish catching. Volume of catch are measured by the tub of fish, which is approximately 50 kilos per tub; fishers regularly sell their harvest by the the tub. Sales are measured by the gross income of fishers are they have unloaded their harvest in the fish port, and before deducting cost of operation and banca lease expense.

Fishers raised capital and funding for every fish catching. They do not normally have a revolving capital to be used. Thus, every after fish catching, they can already measure if they gain (and how much they earn) or lose, based on their cost and sales on every fish catching. The manager of the crew, who sometimes is the

boat owner or the person who leases the boat, assembles its crew before fish catching. He raises and manages the fund for fish catching. He budgets the cost of operation and also takes the boat captain role. He has also contacts with the brokers and buyers, and negotiates with them during the trading of the harvests.

Cost of operation. When asked whether their cost of operation had been affected by the pandemic, 56 out of 58, or 97% of respondents expressed that the Covid-19 pandemic has affected their cost of operation. Table 2 shows the pandemic-related effect on the cost of operation of the fishers in terms of their capital on each fish catching. During peak season, respondents held that their cost of operation increased by 17%. The cost of operation before pandemic was within the mean of Php 2,090.00 on each fish catching; but during pandemic, it went up to the mean of Php 2,520.00. During lean season, the cost of operation during the pandemic also increased by 12%, on each fish catching. From the mean of Php 3,920.00 before pandemic, it went up to a mean of Php 4,450.00 during the pandemic. This cost of operation includes, their crude oil and gasoline expense, food for the crew, and other costs for minor repair of fishing gears, such as fishing nets and gears.

Table 2. Effect on cost of operation during pandemic

Cost of Operation	Pre-pandemic	During Pandemic	%
Peak season	Php 2,090	Php 2,520	17% increase
Lean season	Php 3,920	Php 4,450	12% increase

Fishers have attributed this effect on the increase of the prices of the gasoline/crude oil, food, and fishing gears/equipment. Due to the increasing price of the gasoline and crude oil, fishers admitted that it affected heavily on the cost of their fishing expenses. Depending on the size of their engine, they said that they consume about 800-1,500 during peak season, while 2,500-3,500 during lean season. The reason for the huge difference of cost of operation between the two seasons is due to the distance of fishing areas during the two seasons. During peak season, the shoals of fishes, particularly sardines fish, are caught in the municipal waters of Bulan, which is an

average of 15 nautical miles from the shore, while during lean season, fishers travel to the fishing areas of Samar provinces, which takes them 4 to 5 hours of travel time. Figure 1 shows the fishing areas during peak and lean seasons according to the accounts of the fishers. Map is taken from Viamichelin map website (n.d.). It can be observed the distance of fishing areas between the two seasons and how distant are the two areas from Bulan coastal areas. Almost all boat engines used by local fishers use crude oil, very few use gasoline. However, some fishers use gasoline for their generator set as they need electric power for the light bulbs during fish catching.

Apart from the gasoline and crude oil expense, is the expense on food. Since there is an inflation on basic commodities during pandemic, fishers believed that their food expense had also increased. Fishers bring food in their fish catching, particularly during the

long travels on lean seasons. They bring snacks, their meals and they also cook their meals on their boat. A fishing boat has a crew of 5-10 persons. Fishers say that about 20% of their cost of operation goes to food expense.



Figure 1. Fishing Areas during Peak and Lean Seasons (Viamichelin.com)

Another source of the increase in operation is the increase of prices of fishing gears or fishing materials, such as the fishing ropes and repair of fishing nets. Fishers says that the fishing ropes prices has also slightly increase, thus, it also affected the expenses on the repair of fishing nets. Fishers regularly spend on the repair of the fishing nets as they undergo the natural wear and tear in every fish catching.

Increase of prices of fishing equipment had been also faced by small scale fishers in Bangladesh. Due to low demand and increase in operations costs, many fishers are trapped into debt cycle (Sunny, et al., 2021).

Volume of Catch. When asked whether their volume of catch had been affected by the pandemic, seven percent (7%) of respondents, which is 4 out of 58, expressed that their volume of catch has been affected by the pandemic. On the other hand, the huge

majority, which is 54 out of 58 or 93%, expressed that volume of catch was not affected by the pandemic.

Table 3 shows the quantitative description of the effect on the volume of catch. During peak season, with a mean of 14.9, fishers' volume of catch recorded a very slight decrease of 3% during pandemic, from the mean of 15.3, which is the volume of catch before pandemic. During lean season, with a mean of 9.2, fishers' volume of catch also had a very slight decrease of 2% during pandemic, from the mean of 9.5, which is the volume of catch before pandemic. The volume of catch is measured by the tub of harvest. Fishers unload and sell their harvest by the tub, which holds approximately 50kilos of fish. It means that although there may be changes in the volume of catch as approximated by the fishers, it is very minimal, and only four out of 58 confirmed such effect.

Table 3. Effect on volume of catch during pandemic

Volume of catch	Pre-pandemic	During Pandemic	%
Peak season	15.3	14.9	3% decrease
Lean season	9.5	9.3	2% decrease

Based on the results, the huge majority of fishers believe that the pandemic did not make any direct effect on the volume of their catch. Fifty four out of 58 respondents expressed that if there may be variances in their daily catch, they cannot attribute it directly to pandemic. They explained that if there may be reduction or increase of their catch, some can be attributed to either the season and some to luck. All local fishers in the municipality are involved in the traditional way of fishing, which is using the passive manner of fish catching. They don't employ fish tracking device or any equipment to scan the exact location of the shoal of fish. Fishers rely on their traditional knowledge of the fish track and location, such as, during lean season, sardines are caught in the fishing areas in the northwestern part of Samar-Leyte province and during peak season, sardines swim and can be caught in the Ticao Pass, which is within and near the municipal waters of Bulan. Before and during pandemic,

fishers did not make or employ any significant change or advancement in their fish catching manner.

Sales. When asked whether sales had been affected by the pandemic, thirty two percent (32%) of respondents, which is 19 out of 58, expressed that their sales has been affected, while the sixty eight percent (68%) believed otherwise. As shown in Table 4, during peak season, respondents' reported that their gross sales has decreased by 5%, with a mean of Php 8,550, during pandemic, from the mean of Php 9,050, which was the mean of gross sales before pandemic. And during lean season, respondents' estimated that their gross sales has decreased by 4%, with a mean of Php 7,870, during pandemic, from the mean of Php 8,200, which was the gross sales before pandemic. It can be observed, however, from the results that only minority or 3 out of 10 respondents believed that there is a pandemic-related effect on the gross sales, while seven.

Table 4. Effect on sales of fish during pandemic

Sales price	Pre-pandemic	During Pandemic	%
Peak season	Php 9,050	Php 8,550	5% decrease
Lean season	Php 8,200	Php 7,870	4% decrease

Majority of respondents believe that the pandemic did not significantly and directly affected their sales. They explained that although at the start of the pandemic, there was a slight drop on the price of the fish on the fish port, due to problems with transportation and logistics, it did not last until the flow of transportation had became normal. Majority of respondents generally believed that the buying price of fish within the fish port was not directly affected by the pandemic.

For those who expressed that there was an effect on gross sales, they explained that it was due to some problems of restrictions in the deliveries and transportation of fishes. Fishers said that due to lockdowns and quarantine

protocols, there were a lot of instances that fish buyers had lowered their demand or reduced their frequency of purchase. And this happened during the start of the pandemic.

At the earlier part of the pandemic, there was indeed reduction of operation from the sardines factories, which also prompted the lowering of demand of sardine fishes. This was how the gross sales has been impacted, but after restrictions has been loosened and lifted, the demand went back to normal. The problem occurred, according to the respondents, at the second quarter of 2021, during the start of the implementation of the enhanced community quarantine. They stated that by the start of the third quarter, fish trading almost went back to

normal. Although volatility remains to be a problem, it is no longer pandemic-caused problem, but it is the normal volatility problem that the fishers are perennially facing.

Problems encountered by the fishers related to Covid-19 Pandemic

Table 5 shows the problems encountered by the respondents during the pandemic. The

most common problems cited by the respondents are the increase of crude oil and gasoline prices (n=32, 55%), and the increase of fishing gears and equipment prices (n=29, 50%) and the price volatility of fish (n=25, 43%). It can be observed that these problems may not directly pandemic-caused problems, but these are the problems that respondents are currently facing in the midst of pandemic.

Table 5. Problems encountered by the fishers during pandemic

Problems encountered due to the pandemic	n	%
Increase of crude oil and gasoline prices	32	55
Increase of fishing gears & equipment prices	29	50
Price volatility of fish	25	43
Restrictions of movement due to community quarantine	10	17
Reduced demand	9	16
Implementation of health and safety protocols	5	9

Recently, gasoline and crude oil prices have increased one after another. Gasoline and crude oil expenses take about 60-70% of the fishers' cost of operation. Thus, when gas and oil increase, fishers immensely feel its weight in their operational costs. Consequently, oil prices also prompt price increase in other commodities and merchandises. And respondents also complains of increase in the prices of fishing ropes and nets, which respondents use heavily as part of their fishing equipment.

Fish price is also highly volatile during this pandemic, and respondents complain when price drops to its lowest level, despite the increase in their operational cost. Price of fish in the fish port are not regulated, it is solely dictated by supply and demand. And usually, according to the respondents, they don't have the control in the pricing. Whatever is the buying price in the port, they can no longer negotiate as they have exclusive buyers, who are also their brokers and financiers/loan lenders. Although, this is not solely pandemic-related issue, but it remains and it is much felt during the pandemic.

Other problems encountered by the respondents such as restriction of movement during community quarantine (17%), the strict implementation of health and safety protocols

(9%) and the lowering of demand (16%) are provided with less frequency. It means that the quarantine restrictions and the health and safety protocols are less of a worry for the fishers. Some respondents may have complained of discomfort while using faceshields and of problems with curfew, but they were only minority. It was because fishers were considered as essential workers so they were not strictly included in the quarantine protocols. Further, the wearing of facemasks and faceshields and social distancing are not strictly observed in the fish port and in the banca during their fish catching. It can be also observed that in the coastal areas, the health and safety protocols are not strictly practiced by the residents, compared to the residents in the urban areas.

Strategies used to deal with the problems encountered

Table 6 displays the strategies used by the respondents in dealing with the problems they encountered during pandemic. Undertaking loans (n=38, 66%) is the most common strategy, gathering a majority of response. Do-it-yourself repair of fishing gears (n=25, 43%) and attend more time on secondary job (n=15, 26%) followed as the responses with higher frequency.

Table 6. Strategies used to deal with the problem encountered

Strategies employed	n	%
Undertake loans (from loan sharks and/or brokers)	38	66
DIY repair of fishing gears	25	43
Attend more time on secondary job	15	26
Direct sell of harvest outside of fishport	10	17
Look for alternative source of income	5	9
Follow the health and safety protocols	2	4

Respondents expressed that taking loans from loan sharks and/or brokers are their consistent go-to relief in times of financial deficiency. They, further, admitted that they don't take it from banks or financial institution, but from loan sharks or from their brokers. Thus, during this pandemic, where their cost of operation has increased, and there are times where their catch is unfortunately scarce, they always resort to taking loans to make ends meet. In the study of small-scale fishers in Bangladesh, they encounter problems on inadequate access to financial aid, where they also resort to personal loans (Bhowmik, Irfanullah, Shuchi, Sultana, & Ahmed, 2021).

Respondents also explained that as the prices of fishing gears such as ropes and nets have increased, they would also resort to repairing their gears by their own, instead of buying new or paying to have it repaired. Although, their rest time are sometimes sacrificed, but it gave them savings from additional costs.

Fishers do normally have secondary jobs. Respondents stated that fishers cannot solely rely on fishing alone as their source of income, as there are times when fish is very scarce or when there are natural calamities. Secondary jobs augments fishers' income and can ensure they can still bring something to their family in times of bad weather or lean harvest. Thus, some respondents said that during pandemic they worked as laborer or attend to their farms.

Another strategies cited by the respondent is the direct selling of their harvest outside of fish port. This happened within this pandemic when some wholesale fish buyers (coming from outside of the town/province) and local fishers started to directly trade outside the fishport. The trading excludes the participation of brokers; thus, fishers earn more in that

transaction. But the said strategy did not sit well with local fish brokers, as some fishers, especially those who are exclusively trading with them and who have outstanding loan with them, chose to sell their harvest outside the port.

Other strategies employed by the fishers such as look for alternative source of income (9%) and follow the health and safety protocols (4%) were provided with less frequency.

Policy Recommendation

Through the identified effects of pandemic to the fishers, problems encountered, and strategies used, certain policies are recommended that can be considered in local policymaking.

Ordinance on providing relief and loan assistance to the fishers in times where state of calamities are declared, such as the Covid-19 pandemic and other natural or man-made calamities. The local government units are mandated by the Local Government Code of 1991 (RA 7160) to provide assistance related to agriculture and fishery activities. LGUs should ensure that the people's livelihood are protected and supported in the midst of calamities. Providing relief assistance such as provision of gasoline and crude oil, or fishing gears/equipment, can help fishers in dealing with the problems of calamity-induced inflation. Providing loan assistance during calamities, by forging a linkage with local financial institutions, and offering fishers with very minimal interest, can deter fishers in undertaking loans from loan sharks or from brokers.

Ordinance on providing livelihood to fishers as their alternative source of income. One of the hurtful problems that fishers experienced is the lack of alternative

income generating activities. As fishing is a seasonal livelihood, fishers do have secondary means of livelihood. However, due to lockdowns and other restrictions during the Covid-19 pandemic, fishers are not able to earn from their secondary source of income. In a study of Sunny et al (2021), 9 out of 10 (88%) have complained of lack of alternative income generating activities.

As part of social welfare services of the local government units, it should provide livelihood programs to fishers that would enable them to have an alternate source of income, especially during lean and close seasons. LGUs must create programs promoting sustainable secondary source of income of the fishers. Skills training can be provided or assistance in setting up micro-businesses. At current, fishers have their secondary source of living, but its not sustainable, such as farming, tricycle and pedicab driving, and construction labor. But during lean season or calamities, their secondary jobs are not always available to assist them.

Conclusion and Recommendation

This study determined the effects of the Covid-19 pandemic to the fishers in the town of Bulan, Sorsogon, in terms of their cost of operation, sales and volume of catch. It also identified problems encountered by the fishers during the pandemic and the strategies they used to deal with the pandemic. As an output, policies were recommended to the local government that would help the local fishing industry in mitigating the ill-effects of the Covid-19 pandemic.

Based on the results of the study, it can be concluded that there is indeed effect of the pandemic to the fishers. However, among the three areas of concern, it was only evident in terms of the cost of operation, as the huge majority of respondents confirmed that due to the pandemic, the cost of operation has increased. This was due to the inflation in prices of crude oil/gasoline, food commodities, and fishing gears and equipment. On the other hand, only minority of respondents had confirmed that the pandemic had an effect on the sales and volume of catch of the fishers.

The findings of the study also revealed that the most common problem encountered by the respondents during the pandemic were the increase in gasoline/crude oil prices, increase in fishing gears prices and the price volatility of fish. Respondents revealed that those increases had taken huge effect in their cost of operations. The study also found that respondents take loans (from loan sharks/brokers), repair their fishing gears (instead of buying new or paying for repair) and attend more to their alternative source of income, to overcome the difficulties and challenges brought by the pandemic to their livelihood.

In the light of the findings, the study recommends that the local government must legislate policies that would provide relief assistance to the fishers during the state of calamities such as the Covid-19 pandemic, specifically by providing assistance for crude oil/gasoline expense and/or fishing gears (nets and ropes) expense.

The study also recommends on providing fishers with loan assistance with a very minimal interest. It can be implemented by forging a linkage with private financing institutions and providing fishers quick loan assistance for their cost of operation. This prevents fishers from undertaking loans from loan sharks and fish brokers.

Programs that would promote and support the alternative source of income of the fishers must be also considered. Secondary jobs of fishers are very important as they cannot solely rely on fishing as a stable source of income.

Relaties studies should be conducted in the same research locale, particularly on the socio-economic status of fishers and on problems with price volatility of sardine fish.

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