

COVID-19 IMPACTS ON FOOD SECURITY AND INCOME OF THE FISHERFOLK IN MAGALLANES, SORSOGON, PHILIPPINES

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ABSTRACT

The enormity of the COVID-19 pandemic has led authorities to seek strategies that collect information essential for future health system planning as well as disaster and pandemic preparedness. Focusing on the food security and income situation at a local-scale is all the more imperative given that the municipal fisherfolk has a huge role in the development and success of the Philippine fisheries sector. Here, we turn to assess the impact of the COVID-19 pandemic on the food security and income of municipal fisherfolk in Magallanes, Sorsogon, Philippines. Our survey data from 475 respondents suggested that the fisherfolk households in Magallanes during the COVID-19 crisis, generally experienced food insecurity without hunger. Using the 18-item questionnaire of the US Department of Agriculture (USDA), we identified specific sites that experienced severe food security condition with emphasis on households with dependent members. A significant association based on correlation analysis was found between the level of food security condition and the number of households and year in occupation. Magallanes fisherfolk reacted variously to several challenges brought about by the COVID-19 crisis. Fish availability and demand, and vulnerability to diseases were issues nugatory for the fisherfolk in Magallanes, however, problems directly associated with price increase were identified as impactful (i.e. lack of capital and high cost of supplies/inputs). Difficulties brought by travel restrictions and social distancing were particularly felt by traders and vendors. Taken together, our results demonstrate that the pandemic has compounded the food security and income disadvantages in fisherfolk of Magallanes. We hope that our study sets the foundation to improve the food security monitoring in fisheries households elsewhere in the Philippines (i.e. detect what specific population suffer and where they are), as well as future decisions for emergency management.

Keywords: *livelihood; municipal fisherfolk; Philippine fisheries sector; food security*



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INTRODUCTION

Fisheries sector is an important component of the food supply chain and employment. In the Philippines, this sector supports at least two million people and shares about 1.5% of the country's gross domestic product (GDP) in 2020, i.e. amounting to PhP 17.9 billion (Bureau of Fisheries and Aquatic Resources, 2020). While fishing and fish marketing activities generate livelihoods and put food on the table, populations constituting fisheries sector in the Philippines are considered the poorest (Philippine Statistics Authority, 2017). This sector is also demonstrably sensitive to a number of external conditions (Andriesse, 2018; Fabinyi et al., 2022; Jacinto et al., 2015). Aspects of risk exposure and susceptibility are the primarily drivers why fisheries households play vulnerable (Béné, 2009; Islam & Chuenpagdee, 2022). Any support effort without household situation assessment, particularly during the challenging time (e.g. disaster and pandemic), can result to its increase vulnerabilities.

The impacts of COVID-19 pandemic have fallen disproportionately on vulnerable populations of the fisheries sector (Knight et al., 2020; Sorensen et al., 2020; Stokes et al., 2020). Even during the pre-pandemic period, fisherfolk communities in the Philippines were saddled with problems relating to food hunger and low income (Anticamara & Go, 2016; Muallil et al., 2014; Santos, 2004). During the pandemic, border and quarantine controls and trade disruption have restricted fishing activities nationwide (Ferrer et al., 2021; Marschke et al., 2021). Food security has been likely compromised both directly and indirectly as a result of stringent lockdown upsetting food supply and demand systems (Devereux et al., 2020). Many stories of how the current pandemic destabilized food sources and income among Filipino fisherfolk were publicized (Mirasol, 2020; Novio, 2020). The compounded effects of the pandemic and other extrinsic challenges that the Philippine fisheries sector currently facing, continue to thwart efforts to alleviate food hunger and reduce household poverty.

Hitherto, there are only few studies done on the assessment of the actual effects of COVID-19 pandemic at a finer-scale in the Philippines (Macusi et al., 2022; Manlosa et al., 2021). Encompassing the largest body within the Philippine fisheries sector, municipal fisherfolk are said to be the most vulnerable (Anticamara & Go, 2016; Tolentino-Zondervan & Zondervan, 2022). The impacts of COVID-19 pandemic on every municipal fisheries understandably vary, as each site has its own unique settings. It appears rather urgent to now assess how the pandemic impacts local fisheries sector, where data can be limited or not fully known. Data-driven analysis on current situation on-ground aid decisions for emergency management. We now

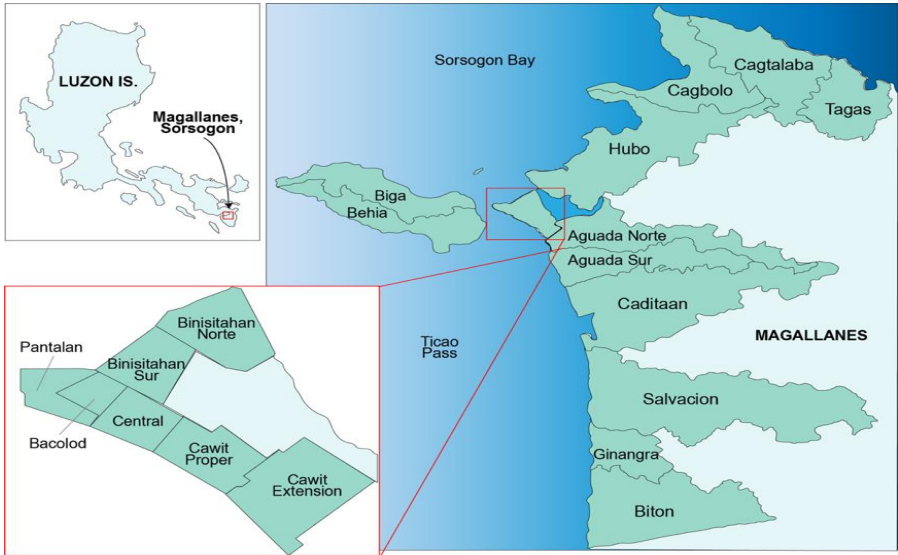
ask whether how the COVID-19 crisis impacts the food security and livelihood situations of fisherfolk at a municipal level in the Philippines. This paper considers the municipality of Magallanes in Sorsogon. We are interested to see how fisherfolk in this area have fared through the two years of health crisis (March 2020 – March 2022), particularly in terms of household food security and livelihood conditions.

METHODOLOGY

Description of the Study Site

Sorsogon is a province located in the southern Bicol Peninsula, Luzon Island. Magallanes (12°49'42"N, 123°50'04"E) is located at the western portion of

Figure 1
Sites Surveyed in this Study



Sorsogon with a land area of 150.09 km². As of 2020, the total population of Magallanes stood to 37,411 (PSA, 2020). The municipality of Magallanes provides an interesting case study for examining the impact of COVID19 crisis on fisherfolk’s food security and income, as fishing dominates the major activity for livelihood and sustenance of the people there. Since the early 1960s, BFAR officially designated Magallanes as one of the major fish landings in the Bicol Region, viz. Fisheries Administrative Order 17-17 ser. 1963. This area is also one of the principal marketplaces of *Sardinella longiceps* (locally referred to as *lawlaw*), as well as other fish resources captured across nearby and extra-Sorsogon seas (Malto & Dumilag, 2023).

Research Respondents

Our survey was undertaken on all 19 coastal Barangays of Magallanes (Figure 1). A total of 475 respondents participated in this study. Three types of respondents (herein collectively referred to as the *fisherfolk* as defined in RA 10654) were identified namely as fishers, traders, and vendors. In this study, fishers (*paralawod*) are those who catch fish for a living and as food sustenance. Traders are middlemen who buy fish caught by the fishers, later sell elsewhere. They deal at least six tubs (bañera), weighing 35–50 kg of captured fish daily, otherwise, they are vendors (*pararegaton*) who directly sell fish to buyers. To determine the sampling size of the target respondents, we used proportional stratified random sampling of fishers from each Barangay based on the record from the Provincial Department of Agriculture (DA). As there is no official report on the number of traders and vendors available locally, convenience sampling was applied for these groups. The summary statistics of the respondents in this study is shown in Table 1.

Table 1

Summary Information of Respondents in this Study

Barangay	Registered no. of Fisher	Number of Respondents			
		Fisher	Trader	Vendor	Total
1. Aguada Norte	32	7	11	9	27
2. Aguada Sur	73	16	5	5	26
3. Bacolod	133	29	2	6	37
4. Biga	225	49	0	5	54
5. Behia	147	32	6	6	44
6. Binisitahan Norte	73	16	4	2	22
7. Binisitahan Sur	69	15	1	4	20
8. Biton	105	23	2	1	26
9. Cagbolo	55	12	3	1	16
10. Cagtalaba	14	3	0	1	4
11. Caditaan	197	43	3	9	55
12. Cawit Extension	50	11	5	5	21
13. Cawit Proper	50	11	1	3	15
14. Central	55	12	6	7	25
15. Ginangra	32	7	1	3	11
16. Hubo	37	8	1	0	9
17. Pantalan	188	41	5	2	48
18. Salvacion	9	2	1	1	4
19. Tagas	28	6	3	2	11
Total	1572	343	60	72	475

Note. The data of registered fisher is based on Provincial Department of Agriculture (DA) as reported in 2020

Research Instrument

The survey questionnaire was designed to assess the impacts of COVID-19 pandemic to the fisherfolk food security and income. Questions were prepared initially in English and later translated to Sorsoganon. The questionnaire was divided into three sections: (1) socio-economic characteristics, (2) impacts of COVID-19 pandemic to food security and (3) income. The socio-economic characteristics of the respondents are summarized in Table 2.

Table 2
Summary of Socio-economic Characteristics Examined in this Study

No.	Socio-economic characteristics (factors)
1	Sex by birth (0 = female; 1 = male)
2	Native to Magallanes (0 = no; 1 = yes)
3	Age group (number)
4	Civil Status (single = 0; married including common law and widow = 1)
5	Family type (nuclear = 0; extended= 1)
6	Education level of respondent (0 = below High School (HS) graduate; above HS graduate = 1)
7	Household size (number)
8	Membership in savings group (0 = no; 1 = yes)
9	Membership in national social security group (0 = no; 1 = yes)
10	Fishing/vending/trading as source of income (0= no ; 1= yes)
11	Monthly household income: (0= below PhP 6,000.00; above PhP 6,000.00 =1)

Note. The monthly household income was based on the regional daily minimum wage rates (non-agriculture and agriculture) as of April 2022 by the Department of Labor and Employment of the National Wages and Productivity Commission.

Data Gathering Procedure

To determine the food security situation of the respondents during the pandemic, the standard 18-item questionnaire of the US Department of Agriculture (USDA) was used (available at <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-u-s/survey-tools/>). The USDA instrument is a range-dependent response consisting of responses: never (negative response), sometimes and often (positive response). The food security situation was categorized according to the USDA standard (Table 3). This questionnaire has been adopted for rural areas sampled globally (Paslakis et al., 2021). Similar instrument has been effectively applied in the Occidental Mindoro, Philippines by Melgar-Quinonez et al. (2006) to assess the household food security in relation with food expenditure, hence, strengthening the validity of the instrument applicable for the fisherfolk households in Magallanes.

Table 3*USDA's Score and Corresponding Category to Determine Security Situation*

Score*	Category
≤2.32	Food secure
2.32–4.56	Food insecure without hunger
4.56–6.53	Food Insecure with moderate hunger
≥6.53	Food Insecure with severe hunger

Note. Score value interpreted as a computed value located at the midpoint between two adjacent household scale values

The participants were asked about the price changes of their typical livelihood expenditures (fuel, ice, bait, repairs and maintenance trip supplies, communication expenses, and travel fair expenses). A five-value Likert scale questions (no impact, little impact, some impact, significant impact, and very significant impact) were also asked, which included the impact severity of 10 common difficulties brought about by the pandemic increased in disease susceptibility, lack of capital, low attendance of service provider, market restriction, unsold captured fish, low consumer demand, low price of vended fish, weather conditions, limited transportation and mobility, and high cost of supplies/inputs (Smith et al., 2020).

Data Analysis

Each response was initially written in print-out forms and later transcribed via Google Form. Response data were populated in Microsoft Excel ver. 10.60 using descriptive statistics in the form of frequencies and percentages. The coefficient of variation was computed to which of the 18-all-household food security items were the most encountered by the respondents. The Pearson correlation analysis was used to determine the association between the food security situation and the factors presented in Table 2, including responses to the effects of pandemic to the fisherfolk income. Prioritization of the 18-question items were ranked using values computed based on coefficient of variation. Only the income dataset were analyzed using one-way analysis of variance (ANOVA) and a post-hoc test as $p < 0.05$ using R software ver. 4.1.3. All other statistical analyses were done using Wizard Pro data analysis version 1.9.49 (Evan Miller, Chicago, IL).

RESULTS

Socio-economic Characteristics

A total of 475 respondents were interviewed across the 19 Barangays of interest. The mean respondents per site was 25 (SD = 7.14). The average age of respondents was 45 (SD = 1.15), which comprised of 85.7% male and 14.4 female. Most of them were native to Magallanes (89.5%). The respondents included a greater percentage of fishers (72.2%) followed by vendors (15.2%) and traders (12.6%). Majority of the respondents (93.5%) claimed that fishing and fish marketing activities were their main source of living with an average of 22 (SD = 1.27) years in occupation. Most of the respondents were either graduates of secondary (47.6%) or primary (41.9%) education. Nuclear family predominates the population by 78.8%, reflecting the 75.2% married status of a 40 (SD = 1.39) mean years of residency. Households with at least one member aged below 18 years old accounted for the 72.8% the population. The average number of household members was 5 (SD = 0.21).

Most of the respondents (75.8%) claimed that indications of the COVID-19 virus were never felt by them, i.e. for the entire last two years. Twenty respondents (4.2%) however were a confirmed case of the COVID-19 virus infection. As of 2 April 2022, 89.3% were already vaccinated of which only 5.6% were boosted. There were still unvaccinated (10.7%). Other major medical issues were identified in 25.9% of the population, which included cardiovascular diseases (22.5%), common colds and flu (19.2%) and musculo-skeletal disorders (15%).

Food Security Situation

The summary of food security situation in Magallanes during the COVID-19 pandemic is presented in Figure 2. The average Magallanes fisherfolk households showed food insecurity without hunger ($M = 3.51$, $SD = 1.15$). The percent share of each level of food security situation were as followed: food secure: 26.7%; food insecure without hunger: 34.3%, food insecure with moderate hunger: 21.50% and food insecure with severe hunger: 17.5%.

Examination of food security condition among the 19 sites ranged from food secure to food insecure with moderate hunger. Only in Hubo ($M = 0.75$, $SD = 1.41$) and Aguada Norte ($M = 1.59$, $SD = 1.97$) indicated food secured areas while food insecurity with moderate hunger was merely detected in Aguada Sur ($M = 5.62$, $SD = 1.36$). All other sites (average values at 0.32–4.56) expressed food insecurity without hunger. The geographical food situation (i.e. food insecurity without hunger) was comparable with that of the indication presented per respondent group: fishers ($M = 3.64$, $SD =$

1.39), traders (M = 3.57 SD = 1.64), and vendors (M = 3.44, SD = 1.62). Only traders from Binisitahan Sur (M = 7.00, SD = 0) had a condition of food insecure with severe hunger. In terms of food security among households with dependents (i.e. with at least one member of 18 years old and below), condition of food insecurity without hunger (M = 4.1, SD = 1.45) across site was presented. All fisherfolk households with dependents in Binisitahan Norte indicated food insecurity with severe hunger (Fisher: M = 7.58, SD = 1.38; Trader: M = 7.40, SD = 0.55; Vendor: M = 8.00, SD = 0). Fishers with dependents in Central (M = 5.50, SD = 2.59), traders from Cagbolo (M = 7.50, SD = 0.71), and vendors from Bacolod (M = 7.40, SD = 1.52) indicated similar situation. Among the 18-food security problems measured, the problem “adult(s) cut or skipped meals”, “worried food would run out”, and “adult do not eat for whole day” were the top three most encountered problems among the Magallanes fisherfolk (Table 4).

Figure 2

Food security situation across the 19 Barangay fisherfolk in Magallanes, Sorsogon, Philippines.

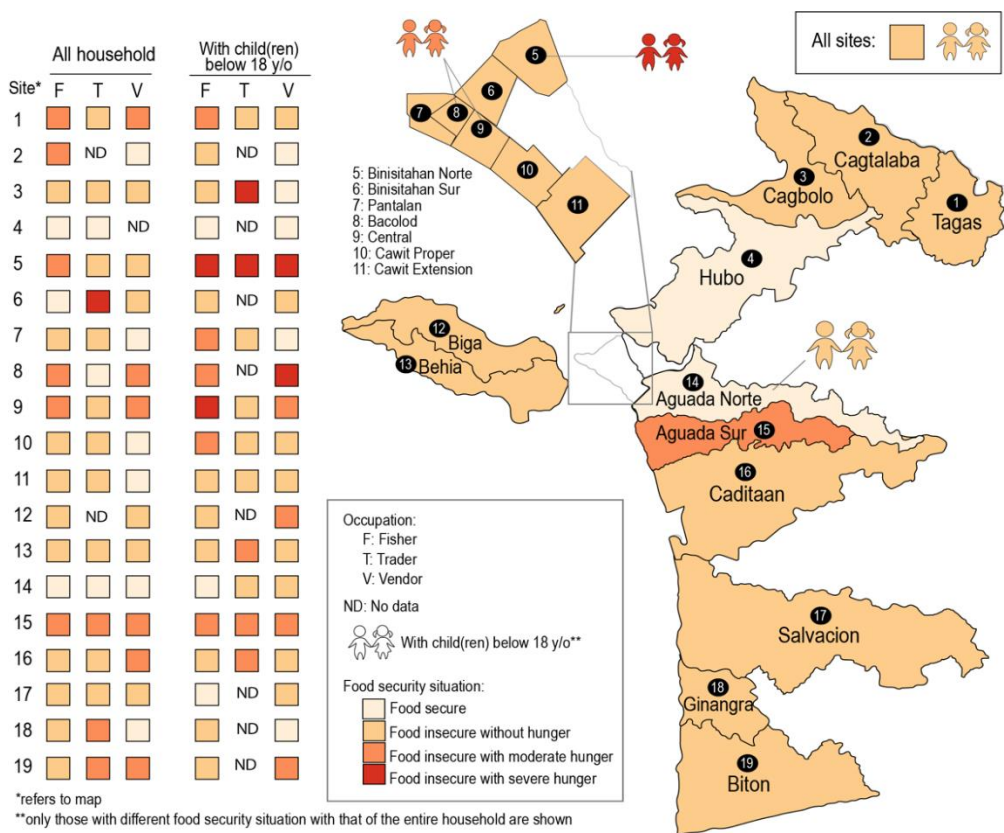


Table 4
Rank of Food Security Problems Encountered by Magallanes Fisherfolk during the COVID-19 Pandemic

Rank	Item	CV	Mean	SD
1	Adult(s) cut or skipped meals, 3+ months	0.444	0.836	0.371
2	Worried food would run out	0.497	0.803	0.398
3	Adult(s) do(es) not eat for whole day, 3+ months	0.505	0.800	0.404
4	Food bought just did not last	0.615	0.726	0.447
5	Could not afford to eat balanced meals	0.616	0.725	0.447
6	Few kinds of low-cost food for children	0.821	0.598	0.491
7	Could not feed children a balanced meal	0.868	0.571	0.496
8	Children do not eat for whole day	0.871	0.569	0.496
9	Children skip meals, 3+ months	0.929	0.541	0.502
10	You ate less than felt you should	0.994	0.504	0.501
11	Adult(s) cut or skipped meals	1.057	0.473	0.500
Table 4 (continuation)				
12	Children were not eating enough	1.060	0.472	0.500
13	You lost weight because not enough food	1.411	0.335	0.473
14	You were hungry but did not eat	1.479	0.314	0.465
15	Cut size of children’s meals	1.518	0.303	0.460
16	Children ever hungry	2.430	0.145	0.353
17	Adult(s) not eat for whole day	2.738	0.118	0.323
18	Children ever skip meals	2.738	0.118	0.323

Note. CV: coefficient of variation, SD: standard deviation

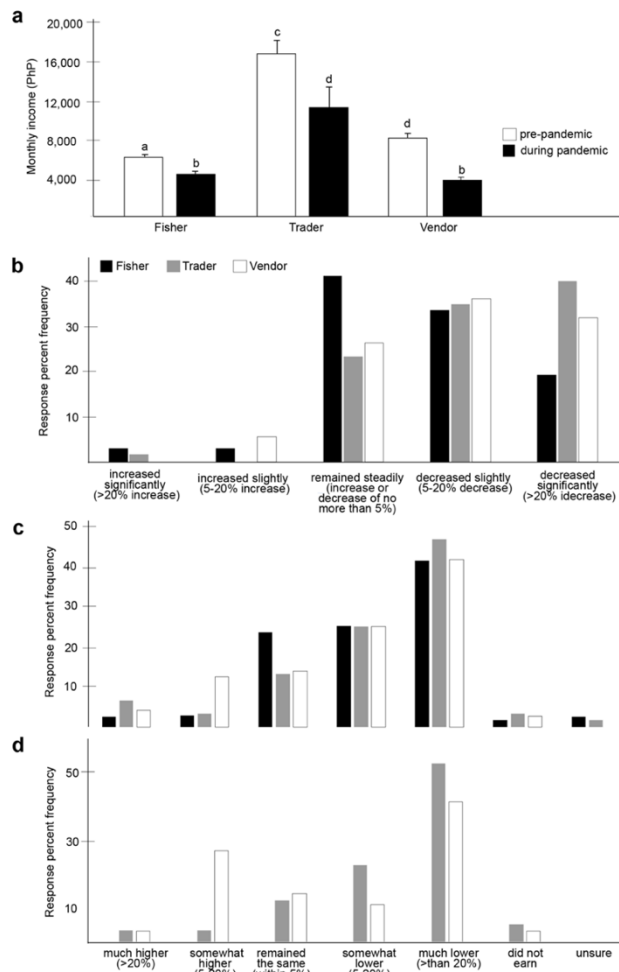
Income

The income situation of Magallanes fisherfolk as affected by the impacts of COVID-19 pandemic is shown in Figure 3. Most of the respondents (63.79%) received below the daily minimum wage for Sorsogon (i.e. PhP 310.00 daily wage rate as of April 2022 for Region V, see <https://nwpc.dole.gov.ph/regionandwages/region-v-bicol/>). Before the pandemic, a fisher, trader, and vendor in Magallanes may have an average income of PhP 6,380.00 (ranged at PhP 2,000.00–30,000.00), PhP 16,565.00 (ranged at PhP 4,000.00–50,000.00), and PhP 8,350.00 (ranged at PhP 4,000.00–20,000.00), respectively. However, due to the difficulties encountered during the pandemic, they were only able to generate an average income of PhP 4,220.00 (ranged at PhP 1,000.00–30,000.000), PhP 11,445.00 (ranged at PhP 2,000.00–40,000.00), and PhP 3,950.00 (ranged at PhP 2,000.00–15,000.00), respectively.

Magallanes fisherfolk saw a significant income decline during the COVID-19 pandemic (Figure 3a). The income of fishers and vendors had no significant difference during the pandemic while the income earned by the traders during pandemic was comparable to that of the income of the vendors prior the pandemic. The income per response percent frequency varied from 5% to >20% decrease (Figure 3b). The effect of the travel restrictions (Figure 3c) and social distancing (Figure 3d), particularly for traders and vendors, were largely felt in terms of income at a much lower expression (<20%) prior the pandemic.

Figure 3

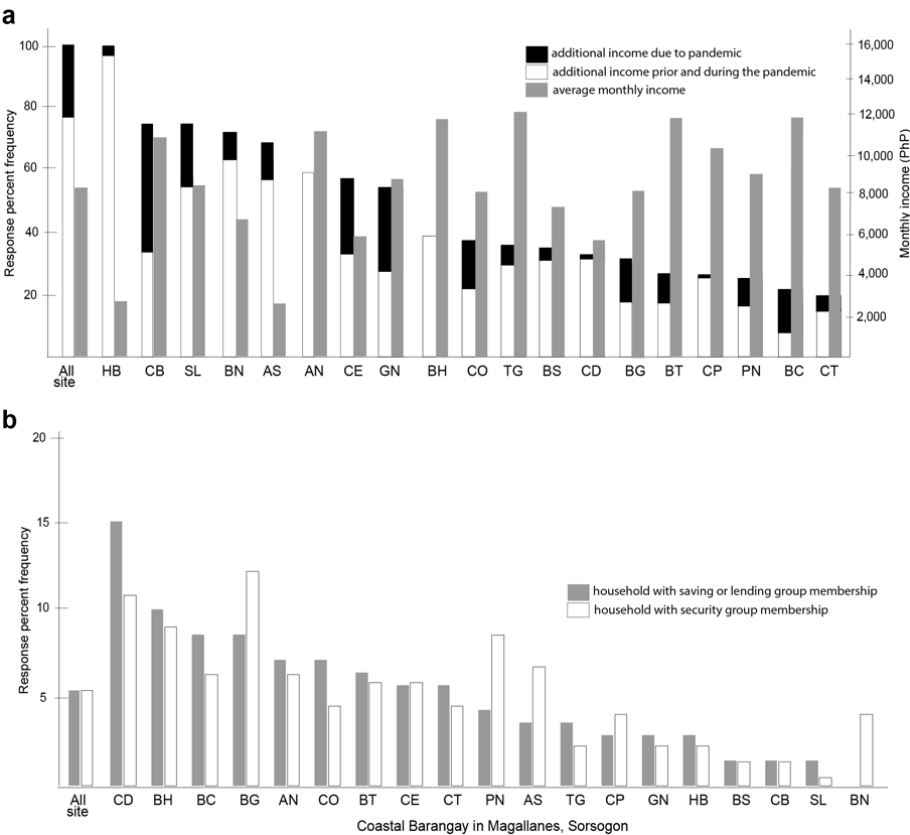
Income situation of Magallanes fisherfolk during COVID-19 pandemic



Note. (A-B) Comparative monthly income of fishers, traders, and vendors in Magallanes prior and during the COVID-19 pandemic by value (A) and change response percentages (B). The values are displayed as mean \pm standard error. Different letters (a, b, c, d) above the bars indicate statistical differences based on Tukey's test ($p < 0.05$, one-way ANOVA). The state of

income among the Magallanes fisherfolk as affected by travel restrictions and (C) social distancing (D) per response percent frequencies. The measure of social distancing was only obtained from vendors and traders.

Figure 4
Response Frequency of Respondents with Household Member having Additional Income and Support Groups (saving, lending, and/or security)



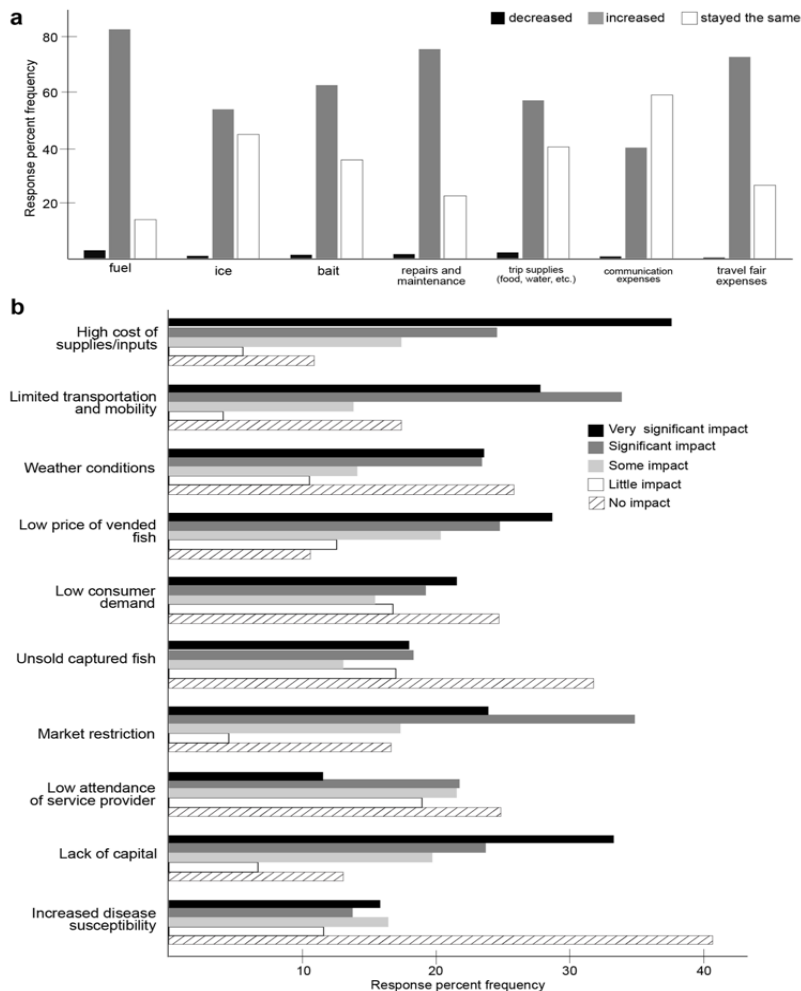
Note. (A) Response frequency of respondents with household member having additional income (n=188) per site including average mean of their monthly income. (B) Response frequency of respondents of respondents with saving or lending group and security group memberships. AN: Aguada Norte, AS: Aguada Sur, BC: Bacolod, BG: Biga, BH: Behia, BN: Binisitahan Norte, BS: Binisitahan Sur, BT: Biton, CB: Cagbolo, CD: Caditaan, CO: Cagbolo, CE: Cawit Extension, CP: Cawit Proper, CT: Central, GN: Ginangra, HB: Hubo, PN: Pantalan, SL: Salvacion, TG: Tagas.

Additional income and support memberships

A total of 39.57% (n = 188) of the respondents had at least one household member having an occupation. Majority (58.57%) of them worked as fishers followed by private workers (33.09%), LGU personnel (12.57%), traders (5.95%) and vendors (2.97%). Most of them worked even prior the pandemic (Figure 4a). Their average monthly income was around PhP 8,500.00. The Only 29.1% and 46.10% of the respondents had a membership for at least one savings/lending and national security group, respectively. The mean population membership to both support networks per site was low, i.e. around 5% only (Figure 4b). Majority (92.46%) of the fisherfolk households in Magallanes was member of the DSWD program Pantawid Pamilyang Pilipino Program (4Ps) while only 28.84% represented membership of at least one private saving/lending network (GSAC, SEDP, ASA, JMH, etc).

Figure 5

Impact on price changes on typical livelihood cost and problem impact severity during the COVID-19 pandemic in Magallanes



Note. (A) Response percent frequency of price changes on typical livelihood cost and (B) impact severity to common encountered problems during the COVID-19 pandemic in Magallanes.

Table 5
Summary of Pearson Correlation Analyses

Food security situation	A	B	C	D
1. Site	<0.001	<0.001	<0.001	0.016
2. Occupation				
Fisher	0.392	0.425	0.932	0.057
Trader	0.542	0.322	0.527	0.206
Vendor	0.614	0.937	0.632	0.228
3. Sex	0.590	0.713	0.656	0.516
4. Age	0.338	0.729	0.827	0.189
5. Years of residency	0.478	0.994	0.869	0.310
6. Native to Magallanes	0.901	0.960	0.924	0.917
7. No. of the household members	0.170	0.354	0.848	0.011*
8. Family type	0.049	0.267	0.676	0.651
9. Civil Status	0.510	0.914	0.405	0.998
10. With household member(s) below 18 y/o	0.413	0.478	0.407	0.336
11. Education	0.139	0.134	0.396	0.007
12. Years in occupation	0.285	0.261	0.602	0.001*
13. As main source of livelihood	0.048	0.155	0.877	0.488
14. With other source	0.453	0.568	0.659	0.752
15. Salary	0.280	0.996	0.791	0.360
16. With saving/lending membership	0.801	0.046*	0.011*	0.574
17. With social membership	0.173	0.257	0.265	0.301
Difficulties brought about by the pandemic				
1. <i>Increased disease susceptibility</i>	0.024*	0.13	0.026*	0.041*
2. <i>Lack of capital</i>	<0.001*	0.487	0.238	<0.001*
3. <i>Low attendance of service provider</i>	<0.001*	0.823	0.126	0.015*
4. <i>Market restriction</i>	<0.001*	0.388	0.003*	0.001*
5. <i>Unsold capture fish</i>	0.668	0.001*	0.069	0.012*
6. <i>Low consumer demand</i>	0.746	0.003*	0.016*	0.134
7. <i>Low price of vended fish</i>	0.509	<0.001*	0.004*	<0.001*
8. <i>Weather conditions</i>	<0.001*	0.004*	0.014*	0.297
9. <i>Limited transportation and mobility</i>	<0.001*	0.942	0.483	0.002*
10. <i>High cost of supplies</i>	<0.001*	0.336	0.538	0.041*

Note. Summary of Pearson correlation analyses (*p*-value) between the identified levels of food situation and socio-economic variables including problems brought by the COVID-19 pandemic in Magallanes,

Sorsogon. A: Food secure, B: food insecure without hunger, C: food insecure with moderate hunger, D: food insecure with severe hunger.

*represents significant association at $p < 0.05$

Livelihood expenditures and impact severity to difficulties brought by the pandemic

Except for the communication expenses, 40–80% response frequency indicated that all other six livelihood expenditures (fuel, ice, bait, repairs and maintenance, trip supplies, and travel fair expenses) have increased during the pandemic (Figure 5a). Response to severity impacts on the 10 commonly encountered difficulties during the pandemic varied (Figure 5b). Four of these problems namely “high cost of supplies/inputs” (41.53%), “low price of vended fish” (31.70%), “low consumer demand” (23.84%) and “lack of capital” (36.81%) indicated the highest response frequency of very significant impact. Problems such as “increased in disease susceptibility” (40.44%), “low consumer demand” (24.72%), “unsold captured fish” (31.79%), “weather conditions” (25.84%), and low attendance of service provider (24.88%) indicated a higher response frequency of no impact.

Relationship of variables to food security situation during the pandemic

Table 5 summarizes the relationship between the identified level of security situation to various variables (see Table 2) and those 10 problems commonly encountered by the fisherfolk households in Magallanes during the pandemic. Significant correlations were not observed in socio-economic variables among level of food security, save for the number of the household members ($M = 5.88$, $SD = 0.58$) and the year in occupation ($M = 27.96$, $SD = 3.05$) for the population experienced food insecurity with severe hunger and membership to saving/lending group for those belonging to food insecure without (17.5%) and with moderate hunger (30.3%) groups.

DISCUSSION

The results of this study present the impact of COVID-19 crisis on the food security situation and income of municipal fisherfolk in the Philippines. A case control study was carried out in Magallanes, Sorsogon, Philippines. Magallanes fisherfolk generally experience food insecurity without hunger during the pandemic. Among all sites, fisherfolk with dependent household members in Binisitahan Norte experienced food insecurity with severe hunger. We also detected specific segment of fisherfolk in Magallanes who experienced the worst in terms food security and hunger: traders from Binisitahan Sur and Cagbolo (with dependent household members), fishers (with dependent household members) from Central, and vendors (with dependent

household members) from Bacolod. Adult fisherfolk household members appeared to choose skipping meals in a day and worried if food would run out rather than keeping their children hungry. This is a common ethos shaped among Filipino families where the welfare of the children goes as a primal parenting responsibility (Alampay, 2014).

As expected, the high number of household members was shown to be an indicative to identifying a group of households as the most severe in terms of food insecurity. Likewise, the greater number of years in occupation (an average of 28 years) suggested a strong correlation with severe level of food insecurity in Magallanes. This suggests that the longer the year a fisherfolk stays in his/her occupation, the more vulnerable the household he/she belongs to experience food insecurity during the COVID-19 crisis. The longer years for a fisherfolk to remain in his occupation, the more complacent one becomes (Tuler et al., 2008). There is a local thinking in Magallanes that “a fisher should remain a fisher for life” (Chua, personal observation). Fisherfolk households might not be able to conceptually define what food security is (or even poverty), as food problems and hunger are totally normal to them. Accordingly, the design of the present study did not allow causality (of measured variables as direct drivers of food security situation and poverty) to be established and therefore further examination is required.

Based on the Department of Labor and Employment of the National Wages and Productivity Commission, as of April 2022, the regional daily minimum wage rates (non-agriculture and agriculture) for the Bicol Region, where Sorsogon belongs, was PhP 310.00. Citing the respective rate, it can be inferred that Magallanes fisherfolk, particularly, the fishers, have poor income. The daily income from fishing may not be enough to cover the basic necessities of a fisherfolk's household. Since fisherfolk households in Magallanes do not receive a daily income generated from fishing or fish marketing jobs, the income presented here were therefore merely implied. This study did not gather enough data to directly measure the income from days worked in fishing, however, most of the households with fishing as their claimed main source of living had only an income below the standard minimum wage. Considering that the suggested minimum wage satisfies what a common household per site is needed, Magallanes fishers were therefore the most vulnerable.

As expected the greatest challenges the Magallanes fisherfolk faced involved plummeting prices that demand allocation directly affecting their income. Difficulties brought by stringent travel restrictions and social distancing had also a significant impact to traders and vendors, suggesting up to >20% decrease income. Issues on fish supply and consumer demand were partly never seen as a challenge to the

Magallanes fisherfolk. Interestingly, majority of the Magallanes fisherfolk had low disease susceptibility during the pandemic. As of February 2022, the Magallanes Regional Health Unit (RHU) reported 237 confirmed COVID-19 cases, at least 20 (8%) of which were members of fisherfolk communities. In part due to confidentiality issue, the official record did not include other information. We assume that the number of confirmed COVID-19 cases involving members of the fisherfolk communities may likely higher than the count encountered in this study.

Much of the studies on the effect of the COVID-19 pandemic in Philippine fisheries sector involve impacts on fish production and market disruptions per the government's stringent protocols to restrain the spread of the virus (Ferrer et al., 2021; Macusi et al., 2022; Manlosa et al., 2021). Prior to the COVID-19 pandemic, a case study was conducted by Melgar-Quinonez et al. (2006) who determined the household food security in Occidental Mindoro, an area located at the southwest of Luzon, Philippines. They found that most of the households were food secured at 64.5%. A follow-up study in the same site may have been useful to know how a pandemic may change the condition. Accordingly, we found only a single study done by Macusi et al. (2022) who accounted that food inadequacy comprised up to 45% of the fisherfolk households in Davao, Mindanao during the COVID-19 pandemic. Accounting all levels of food insecurity (without and with hunger situations) measured in this study as tantamount to what was meant by "food inadequacy" in Macusi et al. (2022), Magallanes thus accounted for 72%. The former work may expressed a conservative value as this study did not indicate the severity of food security condition that may have taken place in the area. The survey instrument that was used by Macusi et al. (2022) was different from what was used in this study, hence, we cannot completely compare responses. The use of a common instrument such that of the US-DA's to measure the food security experience across households (the one used here) is call forth to achieve comparative typologies and a common reference for future decision-making interventions (Coates et al., 2006; Jones et al., 2013; Webb et al., 2006).

CONCLUSION AND RECOMMENDATION

As the COVID-19 crisis continues and the world is expecting recursive outbreaks, governments worldwide are increasingly concerned about the impacts of the pandemic to key sectors contributing to food provision and income generation. This study contributes to a growing body of research assessing fisheries household-level effects of the COVID-19 pandemic in the Philippines, taking the case of fisherfolk households in Magallanes, Sorsogon. We found that the average Magallanes fisherfolk households experienced food insecurity without hunger during the COVID-19 crisis.

Magallanes fisherfolk also saw a significant income decline, i.e. from 30-60% lower than the income they can generate prior the pandemic. With lower income, people necessitated to look for alternative jobs, mostly online-based selling and other related activities. Accordingly, adult fisherfolk household members prioritized the need of their children at the expense of skipped meals and hunger anxiety. The increasing number of household members was shown to be an indicative to identifying a household, which experienced the most severe in terms of food insecurity and hunger.

We recommend the improvement of food security monitoring system in Magallanes as well as other municipal fisherfolk elsewhere in the Philippines. We advocate the development of strong programs for livelihood and nutrition assistance with highlights on those identified sites with most vulnerable groups in Magallanes. A promotion of policy dialogues with the fisherfolks in Magallanes to assess real-time-challenges face by them is also desired. Together, we place our hope that our study will be useful for the development of programs and policy decisions that have been called for to better position both LGUs and private authorities to achieve maximum support needed by the municipal fisherfolk in the Philippines.

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